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November 18, 1992

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

W. T. Cottle

Vice President

Operations

Grand Gulf Nuclear Station

Attention: Document Control Desk

SUBJECT: Grand Gulf Nuclear Station  
Unit 1  
Docket No. 50-416  
License No. NPF-29  
Voluntary Report of Inadequate Documentation of Design Basis Assumptions  
LER 92-019-00

GNRO-92/00142

Gentlemen:

Attached is Licensee Event Report (LER) 92-019-00 which is a final report.

Yours truly,

WTC/BSF  
attachment

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NRC Form 366  
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3160-0104

EXPIRES 8/31/90

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Grand Gulf Nuclear Station										DOCKET NUMBER (2) 0 5 0 0 0 4 1 6										PAGE (3) 1 OF 0 4		
TITLE (4) Voluntary Report of Inadequate Documentation of Design Basis Assumptions																						
EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)												
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	DIVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES					DOCKET NUMBER(S)								
1	1	0	4	9	2	9	2	0	1	9	0	0	1	1	8	9	2	0 5 0 0 0 0				
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following): (11)																			
1			20.402(b)				20.405(e)				50.73(a)(2)(iv)				73.71(b)							
POWER LEVEL (10)			70.405(k)(1)(i)				50.78(c)(1)				50.73(a)(2)(v)				73.71(c)							
1			20.405(a)(1)(ii)				50.36(e)(2)				50.73(a)(2)(vi)				<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A)							
			20.405(a)(1)(iii)				50.73(a)(2)(j)				50.73(a)(2)(vii)(A)				Voluntary							
			20.405(a)(1)(iv)				50.73(a)(2)(k)				50.73(a)(2)(viii)(B)											
			20.405(a)(1)(v)				50.73(a)(2)(m)				50.73(a)(2)(ix)											
LICENSEE CONTACT FOR THIS LER (12)																						
NAME										TELEPHONE NUMBER												
Bryan S. Ford/Licensing Engineer										6 0 1 4 3 7 1 - 6 5 5 9												
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																						
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC												
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)					MONTH DAY YEAR							
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO												

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

The Grand Gulf Nuclear Station (GGNS) Updated Final Safety Analysis Report (UFSAR) does not correctly reflect the iodine dose conversion factors employed in the design basis Loss of Coolant Accident (LOCA) offsite dose calculation. The UFSAR states that the design basis LOCA offsite dose calculation was performed in accordance with the guidance of Regulatory Guide 1.3. Regulatory Guide 1.3 identifies that the iodine dose conversion factors of ICRP Publication 2 (ICRP 2) should be used in the offsite dose calculation. The GGNS design basis calculation performed by Bechtel Power Corporation used the dose conversion factors of Regulatory Guide 1.109. Preliminary estimates performed with ICRP 2 dose conversion factors result in calculated dose up to 20 percent higher than calculations using the Regulatory Guide 1.109 dose conversion factors. The root cause of this event was inadequate documentation of the design basis assumptions in the UFSAR. The UFSAR will be updated to reflect improved offsite dose calculations and methodologies. Since discussions with Bechtel Power Corporation have indicated that this condition may apply to other licensees, this condition is being reported voluntarily.

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TEXT (If more space is required, use additional NRC Form 388A's) (17)

**A. Reportable Occurrence**

The Grand Gulf Nuclear Station (GGNS) Updated Final Safety Analysis Report (UFSAR) does not correctly reflect the iodine dose conversion factors employed in the design basis Loss of Coolant Accident (LOCA) offsite dose calculation.

The UFSAR states that the design basis LOCA offsite dose calculation was performed in accordance with the guidance of Regulatory Guide 1.3. Regulatory Guide 1.3 Section C item 2.d indicates that the iodine dose conversion factors of ICRP Publication 2 (ICRP 2) should be used in the offsite dose calculation. Instead, following its standard practice, the GGNS Architect Engineer (Bechtel Power Corporation) used the dose conversion factors of Regulatory Guide 1.109. All else being equal, the use of ICRP 2 dose conversion factors results in calculated offsite thyroid doses up to 20 percent higher than doses calculated using Regulatory Guide 1.109 dose conversion factors.

This GGNS design basis offsite dose calculation was performed by Bechtel Power Corporation (Bechtel) using their proprietary LOCADOSE computer code, which incorporates the Regulatory Guide 1.109 dose conversion factors. Although the choice of dose conversion factors does not affect GGNS' compliance with the requirements of 10 CFR 100, this situation is being reported voluntarily to alert other licensees who may be unaware of which set of conversion factors were used in the dose calculations performed by Bechtel.

**B. Initial Conditions**

The plant was in Operational Condition 1 at approximately 100 percent MWt at the time this condition was identified.

**C. Description of Occurrence**

As discussed in LER 92-011-01, GGNS is currently updating the control room and offsite dose calculations to reflect improved methodologies and additional information that is now available. As part of this effort, GGNS Design Engineering was modifying the NRC's TAC-5 computer code to reflect the GGNS design and benchmarking the revised computer code against the UFSAR Chapter 15 design basis analysis. Benchmarking computer runs were performed using the commitments identified in the UFSAR. These commitments included the use of Regulatory Guide 1.3 and consequently, as identified in Regulatory Guide 1.3 Section C item 2.d, the use of the iodine dose conversion factors of ICRP 2. During the benchmarking process, the results of the GGNS computer code did not agree with the results presented in the UFSAR.

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While attempting to determine the cause of this discrepancy it was discovered that the GGNS design basis offsite dose calculation used the dose conversion factors provided in Regulatory Guide 1.109 instead of the iodine dose conversion factors of ICRP 2.

#### D. Apparent Cause

The root cause of this event was inadequate documentation of the design basis assumptions in the UFSAR.

Discussions with Bechtel have subsequently determined that Regulatory Guide 1.109 dose conversion factors were used to more realistically model the consequences of the design basis LOCA. Bechtel considered the use of these dose conversion factors an acceptable way of meeting the guidance of Regulatory Guide 1.3. Although Bechtel has some documentation indicating the NRC's concurrence with the use of Regulatory Guide 1.109 dose conversion factors, Bechtel failed to accurately describe the dose conversion factors when preparing the appropriate FSAR descriptions prior to plant licensing.

#### E. Corrective Actions

As discussed in LER 92-011-01, the control room and offsite dose calculations are being updated to reflect improved methodologies and additional information that is now available. As part of this effort, LOCADOSE is being replaced by the TACT5 computer code and the UFSAR will be updated as necessary to reflect the revised dose calculations.

#### F. Safety Assessment

The use of the dose conversion factors of Regulatory Guide 1.109 does provide an acceptable technical basis for calculating a conservative estimate of the doses to the public resulting for the design basis LOCA event. Although using the dose conversion factors of ICRP 2 increases the postulated design basis offsite accident thyroid doses up to 20 percent from that presented in the UFSAR, the postulated design basis offsite accident doses remain within the limits set by 10 CFR 100.

The condition described does not apply to the design basis dose calculation for the control room. Since the requirements of Regulatory Guide 1.3 do not apply to the control room dose calculations (and no commitments could be identified which suggest that the dose conversion factors of ICRP 2 must be used for the control room dose calculations), the analysis for the postulated control room doses using the dose conversion factors of Regulatory Guide 1.109 as presented in the UFSAR is unaffected by the condition described. Nevertheless, preliminary estimates have been performed which show the postulated control room doses would remain within the limits of General Design Criteria 19 using the dose conversion factors of ICRP 2 along with the maximum allowable control room inleakage



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identified in the GGNS Operating License.

Therefore, the health and safety of the public is not affected by this event.

#### G. Additional Information

This is a final report.

#### H. References

1. Regulatory Guide 1.3, Revision 2, Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss of Coolant Accident for Boiling Water Reactors.
2. Regulatory Guide 1.109, Revision 1, Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR 50, Appendix I.
3. ICRP Publication 2, Report of Committee II, Permissible Dose for Internal Radiation, dated 1959.