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July 6, 1992

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
Design Inadequacies Could Result in Exceeding 10 CFR 100 Limits
LER 92-011-00

GNRO-92/00080

Gentlemen:

Attached is Licensee Event Report (LER) 92-011 which is an interim report.

Yours truly,

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NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

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TITLE (4): Design inadequacies could result in exceeding 10CFR100 limits.

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
									NA	0 5 0 0 0
0 6	0 8	9 2	9 2	— 0 1 1	— 0 0	0 7	0 6	9 2		0 5 0 0 0

OPERATING MODE (9)	POWER LEVEL (10)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
2	0 1 0 1 6	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	X 50.73(a)(2)(vii)	X OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	10 CFR 21 Report
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	X 50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
George A. Zinke/Manager, Nuclear Safety & Assess.	AREA CODE 6 0 1 1 4 3 7 - 1 2 4 5 9

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		1 0	0 9	9 2

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

On June 8, 1992 during a review of previously identified nonconforming conditions consisting of potential secondary containment bypass leakage paths and potential control room boundary leakage paths, it was determined that Grand Gulf Nuclear Station had been in a condition that was outside the design basis of the plant. Immediate corrective actions included installation of a shaft seal design and sealing of the other identified leakage paths. The UFSAR will be reviewed and revised to incorporate the evaluation of allowable secondary containment bypass leakage and its effect on the design basis accident analysis. Other potential corrective actions are dependent upon completion of the root cause determination. This is an interim report. An update will be provided by October 9, 1992. This report is also being submitted pursuant to 10 CFR 21.

NRC Form 366A
(9-83)

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

A. Reportable Occurrence

On June 8, 1992 following a review of previously identified nonconforming conditions consisting of potential secondary containment bypass leakage paths and potential control room boundary leakage paths, it was determined that Grand Gulf Nuclear Station had been in a condition that was outside the design basis of the plant. This condition is being reported pursuant to 10CFR50.73(a)(2)(ii)(B) as a condition that was outside the design basis of the plant, and 10CFR50.73(a)(2)(vii) as an event where a single condition caused independent trains to become inoperable in a single system designed to control the release of radioactive material and mitigate the consequences of an accident. This report is also being submitted pursuant to 10CFR21.

B. Initial Conditions

The plant was in Operational Condition 2 at approximately 6 percent MWt at the time this condition was determined to be reportable.

C. Description of Occurrence

On October 9, 1991, a nonconforming condition was identified in that a temporary shaft seal constructed of a foam rubber type material was installed on the Standby Gas Treatment System (SGTS) [BH] charcoal filter train fans (Q1T48D001A-A and Q1T48D001B-B). The primary safety concern focused on whether the secondary containment drawdown capability was adversely affected by the temporary seals. GGNS System Engineering concluded that drawdown capability was not affected. The specific identified nonconforming conditions were corrected on November 15, 1991 for SGTS B and December 12, 1991 for SGTS A by removal of the temporary seals.

GGNS Design Engineering reviewed the design specification for filter trains and confirmed that the fans were specified and procured by Bechtel Power Corporation with no shaft seals installed. Upon further investigation, it was concluded that the opening or gap between the fan hub and the hole in the fan housing could result in air being drawn into the fan housing and discharged to the environment without being processed through the charcoal filter trains. The GGNS design basis accident analyses did not assume secondary containment bypass leakage.

Therefore it was concluded that an unanalyzed potential secondary containment bypass leakage path existed with the current design. The manufacturer of the fans (Buffalo Forge Company) was contacted to determine how much, if any, leakage into the fans could occur with no mechanism in place to seal the gap between the fan shaft and the housing. On April 28, 1992 Buffalo Forge Company provided to GGNS a conservative estimate of 100 CFM inleakage. On May 1, 1992 an engineering evaluation was completed considering the effects of the deficiency for the then current Operational Conditions (Refueling and Cold Shutdown). The evaluation concluded that SGTS could perform its design safety function of controlling accident radiological releases during refueling operations following two weeks of decay.

Design Engineering evaluated all of the other filter trains in the plant to determine if this was a generic problem. This evaluation revealed that the Control Room Standby Fresh Air (CRSFA) units [VI] (QSZ51D002A-A and QSZ51D002B-B) had no shaft seals which could have resulted in unfiltered air being supplied to the control room environment.

A modification package was prepared to provide a shaft seal design for the SGTS Charcoal Filter Train Fans and the Control Room Standby Fresh Air Units.

On May 20, 1992 during a walkdown of the SGTS Charcoal Filter Train Fans, additional leakage paths were identified. Rework instructions for these additional leakage paths were included in the modification package.

The work packages installing the seals and reworking the other identified leakage paths were signed off complete on June 3, 1992 (Note: The work process for correcting the above discussed condition resulted in a different reportable condition which will be discussed in a separate Licensee Event Report).

On June 8, 1992 this condition was determined to be reportable as a condition that was outside the design basis of the plant.

D. Apparent Cause

The root cause for this condition has not been determined. The apparent cause is a failure of the orignal design/AE to specify a leak-tight construction for the fan housing.

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E. Corrective Actions

An evaluation of similar leakage pathways for ventilation fans was performed. The CRSFA was the only other similar condition.

The shaft seal installation for SGTS and CRSFA was completed on June 3, 1992. The other identified leakage paths were corrected on June 10, 1992.

F. Supplemental Corrective Actions

The UFSAR (e.g., UFSAR Table 6.2-42) will be reviewed and revised to incorporate the evaluation of allowable secondary containment bypass leakage and its effect on the design basis accident analysis. Other potential corrective actions are dependent upon completion of the root cause determination.

G. Safety Assessment

The secondary containment, in conjunction with operation of the standby gas treatment system is designed to limit the thyroid dose and the whole body dose to within the guidelines of 10 CFR 100 at the site boundary and the low population zone and 10 CFR 50 General Design Criterion 19 for the control room operator doses during the design basis accident. The control room habitability system is designed to limit the radiation exposure of control room personnel through the duration of any one of the postulated design basis accidents to within the guidelines of 10 CFR 50 General Design Criteria 19.

The leakage associated with the identified conditions was not measured due to the configuration of the leakage pathways. A qualitative assessment of the potential leakage based on smoke tests estimated the leakage to be minimal for the various identified leakage paths. However, in order to assess the safety significance of the potential bypass leakage paths, conservative maximum expected leakages were calculated. The values calculated were 73 CFM for control room envelope leakage and 215 CFM for secondary containment bypass leakage. The assessment conservatively used an analytical value of 250 CFM for the secondary containment bypass leakage.

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Using the GGNS UFSAR design basis analysis computer code, the input data was modified to incorporate the conservatively calculated bypass leakages. The results indicated that the low population zone and the control room thyroid doses exceeded 10 CFR limits.

In order to more accurately assess the safety significance of the as found condition, a more realistic analysis of the dose consequences was performed using the same computer code. The "realistic" analysis used the same reactor core release source terms as the design basis UFSAR LOCA analysis. Table 1 itemizes the assumptions for the "realistic" case which differ from the design basis case.

TABLE 1

"REALISTIC" CASE ASSUMPTIONS
Suppression Pool Scrubbing (DF=10) assumed per Standard Review Plan 6.5.5
ICRP 30 Dose Conversion Factors
Containment leakage of 0.187%/day (maximum measured by test at GGNS)
Control Room inleakage of 590 CFM (Operating License limit) plus 73 CFM (Bypass Leakage)
SGTS and Control Room measured filter iodine adsorption efficiencies
Actual Control Room Envelope Volume of 252,804 cubic feet
4000 CFM SGTS flowrate (Technical Specification limit)

The "realistic" case still contains a significant margin of conservatism due to source term assumptions, spray removal terms, atmospheric dispersion factors, conservative bypass leakage estimate, etc.

*U.S.GPO:1986-0-624-538/455

Table 2 compares the results of the "realistic" analysis with the current design basis and 10 CFR limits.

TABLE 2

	THYROID			WHOLE BODY		
DESCRIPTIONS	LPZ	EAB	CR	LPZ	EAB	CR
10 CFR LIMITS	300	300	30	25	25	5
UFSAR Design Basis	73.91	103.4	29.54	15.81	12.42	0.67
"Realistic" Case	96.0	20.1	21.1	10.2	6.8	0.42

The doses from the "realistic" assessment were well within the 10 CFR limits. Therefore the health and safety of the public were not compromised due to this condition.

H. Additional Information

Energy Industry Identification System (EIIS) codes are identified in the text within brackets [ ].

This is an interim report. An update will be provided by October 9, 1992.