Entergy

Entergy Operations, Inc.
P. O. Box 756
Port Gibson, MS 39150
Tel 601 437 6409
Fax 601 437 2795

William A. Eaton
Vice President,
Operations
Grand Gulf Nuclear Station

October 4, 2001

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

Subject: LER 2001-003-00 Automatic Reactor Scram Due to Offsite 500 KV Switchyard Problem and EOC-RPT Failure
Grand Gulf Nuclear Station
Docket No. 50-416
License No. NPF-29

GNRO-2001/00073

Ladies & Gentlemen:

Attached is Licensee Event Report (LER) 2001-003-00, which is a final report. This letter does not contain any commitments.

Yours truly,

William A Eaton

WAE/CEB/ceb
attachments: 1. LICENSEE-IDENTIFIED COMMITMENTS
2. LER 2001-003-00
cc: (See Next Page)

cc:

Hoeg	T. L.	(GGNS Senior Resident)	(w/a)
Levanway	D. E.	(Wise Carter)	(w/a)
Reynolds	N. S.		(w/a)
Smith	L. J.	(Wise Carter)	(w/a)
Thomas	H. L.		(w/o)

Mr. E. W. Merschoff (w/2)
Regional Administrator
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive,
Suite 400 Arlington, TX 76011

Mr. S. P. Sekerak, NRR/DLPM/PD IV-1 (w/2)
ATTN: ADDRESSEE ONLY
U.S. Nuclear Regulatory Commission
One White Flint North, Mail Stop O7-D1
11555 Rockville Pike
Rockville, MD 20852-2378

ATTACHMENT 1 TO GNRO-2001/00073
LICENSEE-IDENTIFIED COMMITMENTS

Letter #:	GNRO-2001/00073

COMMITMENT	TYPE (Check only one type)		SCHEDULED COMPLETION DATE (If Required)
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
None	N/A	N/A	N/A

NRC FORM 366 (1-2001) U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 6-30-2001
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)	Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Grand Gulf Nuclear Station	05000 416	1 OF 5

TITLE (4)
Automatic Reactor Scram Due to Offsite 500 KV Switchyard Problem and EOC-RPT Failure

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER 05000
08	07	2001	2001	003	00	10	04	2001	FACILITY NAME	DOCKET NUMBER 05000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR : (Check all that apply) (11)

OPERATING MODE (9): 1							
POWER LEVEL (10): 100							
	20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)
	20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)
	20.2203(a)(1)		50.36(c)(1)(i)(A)	X	50.73(a)(2)(iv)(A)		73.71(a)(4)
	20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)
	20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)		OTHER Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		
	20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)		
	20.2203(a)(2)(v)		50.73(a)(2)(i)(B)	X	50.73(a)(2)(vii)		
	20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)		
	20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Charles E. Brooks, Senior Licensing Specialist	(601) 437-6555

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) **(16)**

On August 7, 2001 at approximately 2017 hours, while operating at steady state conditions, a reactor scram occurred. The scram was the result of a reactor protection system actuation from a Turbine Control Valve fast closure signal. This signal was the result of a generator load transient caused by failure of a 500 kV disconnect. The disconnect that failed is located in an offsite switchyard which directly feeds the GGNS switchyard.

A generator load reject was sensed due to the grid transient, causing generator load demand and valve rate limiters to automatically switch off. A turbine control valve fast closure response was sensed as Turbine Control Valves moved in the closed direction. The reactor scrammed but the End of Cycle Recirculation Pump Trip did not occur, as expected. This event is bounded by the current analyses, as discussed in the safety assessment, Section G.

No major equipment was out of service at the time of this occurrence. The Reactor Core Isolation Cooling system was inoperable due to the performance of corrective maintenance, however the maintenance had been completed and the system was functional at the time of the scram. All control rods inserted and all other equipment responded as expected. The Condensate/Feedwater System was lost shortly after the scram occurred due to hotwell level problems. The Reactor Core Isolation Cooling system was manually initiated and used for reactor water level control.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Grand Gulf Nuclear Station	05000-416	2001	-- 003 --	00	2 OF 5

NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

A. Reportable Occurrence

On August 7, 2001 at approximately 2017 hours, while operating at steady state conditions, a reactor scram occurred (10CFR50.73 (a) (2) (iv)(A)). The scram was the result of a Reactor Protection System (RPS)[JC] actuation from a turbine control valve fast closure signal. This signal was the result of a generator load transient caused by failure of a 500 kV disconnect located in an offsite switchyard. The switchyard where the failed disconnect was located directly feeds the GGNS switchyard.

A generator load reject was sensed due to the grid transient, causing generator load demand and valve rate limiters to automatically switch off. A turbine control valve fast closure signal was sensed as Turbine Control Valves (TCVs) [TA] began to close in response to a sudden drop in load. The reactor scrammed but the End of Cycle Recirculation Pump Trip (EOC-RPT) did not occur (10 CFR 50.73 (a) (2) (vii)).

No major equipment was out of service at the time of the scram. The Reactor Core Isolation Cooling System (RCIC)[[BN] was inoperable due to the performance of corrective maintenance, however the maintenance had been completed and the system was functional at the time of the scram. All control rods inserted and all other equipment responded as expected, except for the Condensate/Feedwater System which was lost after the scram occurred due to hotwell level problems. RCIC was manually initiated and began injecting into the vessel. The manual initiation of RCIC is not reportable under 10CFR50.73 (a) (2) (iv) because feedwater remained in service long enough to restore level to near the normal band. RCIC was started as an option for level control. No ECCS initiated as a result of this event.

Notification was made to the NRC's Emergency Notification System (ENS) reporting this condition pursuant to 10CFR50.72(b)(2)(iv) (B) – "any event or condition that results in actuation of the reactor protection system (RPS) when the reactor is critical except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation" (RPS) [JC].

An update to this ENS report was made reporting the EOC-RPT failure. This condition was reported pursuant to 10CFR50.72(b)(3)(v)(A) – "Any event or condition that at the time of discovery could have prevented the fulfillment of the safety function of a structure or systems that are needed to shut down the reactor and maintain it in a safe shutdown condition". Upon further review and based on engineering judgement, it is expected that the EOC-RPT function to down-shift the recirculation pumps would have occurred under the design basis limiting condition i. e., full generator load rejection with failure of the main turbine bypass valves. The partial load rejection that occurred during this event is a operational transient. This event is being reported as a single cause or condition (design flaw), that caused two independent channels to become inoperable in a single system designed to mitigate the consequences of an accident (10 CFR 50.73(a) (2) (vii) (D)).

B. Initial Conditions

At the time of the event the reactor was in OPERATIONAL CONDITION 1 with reactor power of approximately 100 percent. Moderator temperature was approximately 540 degrees F and reactor water level approximately 36 inches.

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Grand Gulf Nuclear Station	05000-416	2001	-- 003 --	00	3 OF 5

NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

C. Description of Occurrence

On August 7, 2001, at approximately 2017 hours, while operating at steady state conditions, a reactor scram occurred. The scram was the result of RPS actuation from a TCVs fast closure signal. This signal was the result of a generator load transient caused by failure of a 500 kV disconnect located in an offsite switchyard. This offsite switchyard where the disconnect failed directly feeds the GGNS switchyard. As a result of the TCV fast closure, reactor pressure increased to approximately 1040 psig.

Turbine bypass control valves responded properly and no safety relief valves lifted. Reactor water level dropped immediately after the scram due to void collapse, and both recirculation pumps downshifted on reactor water level 3. Reactor water level dropped to about –35 inches wide range on the initial transient. Feedwater responded properly and restored level.

While feedwater was being placed on startup level control, a lowering level trend made it necessary to increase reactor feed pump discharge pressure to feed the vessel. The feedwater system adjustment resulted in an inadvertent overfeed and reactor water level 8 (53.5 inches) and reactor water level 9 (56.0 inches) set points were exceeded briefly. Reactor water level peaked at about 58 inches wide range. Subsequently, hotwell level control malfunctioned causing condensate pumps to trip on low hotwell level and loss of feedwater. Reactor water level dropped to about 15 inches wide range and was recovered after RCIC was manually initiated as an option to maintain reactor water level until hotwell level was restored and the condensate/feedwater system was returned to service. No ECCS initiation or Primary/ Secondary Containment isolation set points were reached and all safety systems functioned properly, except for the EOC-RPT failure. All other equipment operated as expected. No plant conditions or evolutions in progress at the time of the scram had an effect on the events leading to the scram or on the consequences of the scram.

D. Apparent Cause

Based on the post trip analysis, the cause of the reactor scram was TCV fast closure as sensed by secondary fluid pressure of less than 46.0 psig as load demand turned off and rate limiter was bypassed due to a sensed load reject signal. The initiating event was a phase-to-phase fault at an offsite switchyard that directly feeds the GGNS switchyard and a subsequent transient on the 500 kV feeder. The fault on the feeder line resulted in generator load fluctuations, which were sensed by the turbine EHC logic as a generator load reject.

The root cause for failure of the EOC-RPT function to actuate was determined to be installation of an inadequate design, where a turbine control system failure could impact the NSSS system.

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Grand Gulf Nuclear Station	05000-416	2001	-- 003 --	00	4 OF 5

NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

E. Corrective Actions

Immediate Corrective Actions:

1. CR-GGN-2001-1371 was initiated to investigate the initiating event for the scram and the failure of EOC-RPT to actuate.

2. An on-shift post trip analysis was performed which provided an adequate basis for restart based on identification of the initiating event and assessment of safety system performance. Restart was allowed but restricted to less than 40 percent Core Thermal Power and slow speed recirculation pumps until the EOC-RPT Technical Specification was changed to allow operation above 40 percent power via emergency Technical Specification Amendment 148.

Long Term Corrective Actions:

3. ER 2001-0285 is being developed for the EOC-RPT logic.

F. Previous Occurrences

LER 2000-005-00, dated October 13, 2000 reported an automatic reactor scram that occurred on September 15, 2000. This scram was the result of a turbine control valves fast closure signal. The EOC-RPT function did not occur during this event. The EOC-RPT failure was reported in LER 2000-006-00, dated October 13, 2000.

G. Safety Assessment

The safety significance of this event concerns the failure of the EOC-RPT to function in response to a partial generator load reject and the associated TCV fast closure. The purpose of this function is to trip the recirculation pumps to slow speed in anticipation of a pressurization transient in the reactor vessel. The EOC-RPT is activated whenever main turbine electro-hydraulic control (EHC) secondary fluid pressure drops below the trip setpoint. The conditions necessary to achieve the trip set point are governed by the turbine control system. The EOC-RPT function is credited in the cycle-specific transient analysis in the development of the MCPR operating limit.

As described in UFSAR Section 15.2.2, the generator load rejection and the generator load rejection with failure of the bypass valves are classified as incidents of moderate frequency or anticipated operational occurrences. Events in this category are analyzed to prevent fuel cladding failures. In this case, operating limits are established, such that if the event occurs, the Technical Specification 2.1.1.2 MCPR safety limit and Linear Heat Generation Rate (LHGR) overpower criteria are protected. During this event, all control rods inserted as expected on the RPS scram associated with the Turbine Control Valve fast closure.

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Grand Gulf Nuclear Station	05000-416	2001	-- 003 --	00	5 OF 5

NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

G. Safety Assessment (Continued)

Additionally, the TCVs did not completely close and the bypass control valves responded properly. As such, the vessel pressurization for this event was significantly less severe than that of the current analyses, which assumes full closure of the TCVs and failure of the bypass system. Therefore, the actual event is bounded by the current analyses ensuring that the MCPR safety limit and LHGR overpower criteria were protected and the health and safety of the public were not compromised.

H. Additional Information

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