



Crystal River Nuclear Plant
Docket No. 50-302
Operating License No. DPR-72

Ref: 10 CFR 50.73

June 21, 2004
3F0604-03

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: LICENSEE EVENT REPORT 50-302/04-002-00

Dear Sir:

Please find enclosed Licensee Event Report (LER) 50-302/04-002-00. The LER discusses Emergency Diesel Generator EGDG-1A being inoperable for a period longer than permitted by Crystal River Unit 3 Improved Technical Specification 3.8.1, due to a fuel oil header outlet check valve leaking past its seat. This report is being submitted pursuant to 10CFR50.73(a)(2)(i)(B).

No new regulatory commitments are made in this letter.

If you have any questions regarding this submittal, please contact Mr. Sid Powell, Supervisor, Licensing and Regulatory Programs at (352) 563-4883.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jon A. Franke'.

Jon A. Franke
Plant General Manager
Crystal River Nuclear Plant

JAF/dwh

Enclosure

xc: Regional Administrator, Region II
Senior Resident Inspector
NRR Project Manager

Progress Energy Florida, Inc.
Crystal River Nuclear Plant
15760 W. Powerline Street
Crystal River, FL 34428

JE22

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.

1. FACILITY NAME CRYSTAL RIVER UNIT 3	2. DOCKET NUMBER 05000 302	3. PAGE 1 OF 7
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4. TITLE
Emergency Diesel Generator Inoperable Due To Fuel Oil Header Outlet Check Valve Leaking Past Seat

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTI AL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
04	23	2004	04	- 002	- 00	06	21	2004		05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE 1	10. POWER LEVEL 100%	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
		20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(iii)(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)	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)	X 50.73(a)(2)(i)(B)	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)	

12. LICENSEE CONTACT FOR THIS LER	
NAME Dennis W. Herrin, Lead Engineer	TELEPHONE NUMBER (Include Area Code) (352) 563-4633

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
A	EK	V	T103	Y					

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

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

At 12:37, on April 23, 2004, Progress Energy Florida, Inc., Crystal River Unit 3, was in MODE 1 (POWER OPERATION) at 100 percent RATED THERMAL POWER. During performance of surveillance procedure SP-354A, "Monthly Functional Test of the Emergency Diesel Generator EGDG-1A," EGDG-1A did not start and achieve steady state voltage and frequency in less than or equal to 10 seconds from standby conditions upon receipt of a simulated Engineered Safeguards signal as required by Technical Specifications. The cause for this event was fuel oil header outlet check valve DFV-61 leaking by its seat due to foreign material lodged between the valve disk and seat. This condition allowed fuel oil to gradually drain back through the header outlet to the fuel oil tank, partially depleting the fuel header prime. The check valve was replaced. Based on engineering judgment, EGDG-1A was inoperable for a period of time longer than allowed by Technical Specifications. This condition is being reported under 10CFR50.73(a)(2)(i)(B) as a condition prohibited by Technical Specifications. This condition does not represent a reduction in the public health and safety. No previous similar occurrences have been reported to the NRC by CR-3.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
CRYSTAL RIVER UNIT 3	05000302	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 7
		04	-- 002 --	00	

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

EVENT DESCRIPTION

At 12:37, on April 23, 2004, Progress Energy Florida, Inc., (PEF) Crystal River Unit 3 (CR-3) was in MODE 1 (POWER OPERATION) at 100 percent RATED THERMAL POWER. During performance of surveillance procedure SP-354A, "Monthly Functional Test of the Emergency Diesel Generator EGDG-1A," EGDG-1A [EK, DG] did not start and achieve steady state voltage and frequency in less than or equal to 10 seconds from standby conditions upon receipt of a simulated Engineered Safeguards (ES) signal as required by Improved Technical Specification (ITS) Surveillance Requirement 3.8.1.6. The fast start time was 11.4 seconds (average of two stop watch measurements (11.5 seconds and 11.7 seconds) and the installed electronic timer (11.1 seconds)). EGDG-1A was shut down in accordance with SP-354A.

The actions of ITS 3.8.1, Condition B, "One EDG inoperable," were previously entered for the performance of SP-907A, "Monthly Functional Test of 4160V ES Bus "A" Undervoltage and Degraded Grid Relaying." Those actions remained applicable following the unacceptable EGDG-1A fast start testing.

Troubleshooting the EGDG-1A start problem revealed fuel oil header outlet check valve DFV-61 [EK, V] leaking by its seat. This condition allowed fuel oil to gradually drain back through the header outlet to the fuel oil tank, partially depleting the fuel header prime (e.g., not maintaining EGDG fuel header full of fuel in standby conditions). DFV-61 had been replaced as part of a preventive maintenance activity during the most recent performance of refueling interval engine/generator inspections in accordance with maintenance procedure MP-499, "Emergency Diesel Generator Engine Inspection/Maintenance," in February 2004.

Evidence to establish a time and date for when EGDG-1A became unable to demonstrate a successful fast start test result is limited. However, the following information is known: (1) DFV-61 was replaced with a new component that had been bench tested successfully on receipt inspection and was placed in service for the first time on February 26, 2004; (2) the most recent successful completion of the fast start surveillance test was documented on February 28, 2004; (3) the most recent documented demonstration of adequate fuel oil header prime was upon shutdown of EGDG-1A from its most recent run on March 26, 2004; and, (4) the failure mode of the fuel oil header losing prime is a standby phenomenon and could not have happened immediately upon the start demand on April 23, 2004. Therefore, loss of adequate fuel oil header prime occurred between March 26, 2004, and April 23, 2004.

EGDG-1A was returned to service at 0457 on April 25, 2004. In order for this event to be determined not reportable, EGDG-1A would have had to become inoperable on or after 0457 on April 22, 2004, the day before performing SP-354A. Based on engineering judgment, EGDG-1A became inoperable at some point prior to that time. Therefore, EGDG-1A is considered to have been inoperable for a period of time longer than the 72 hours allowed by ITS 3.8.1, Condition B. This condition is reportable under 10CFR50.73(a)(2)(i)(B) as a condition prohibited by Technical Specifications.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
CRYSTAL RIVER UNIT 3	05000302	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 7
		04	-- 002 --	00	

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

SAFETY CONSEQUENCES

Two EGDGs automatically provide alternating current (AC) electrical power to 4160 volt (v) ES buses 3A and 3B [EB, BU] following a loss of off-site power or a degraded grid voltage condition. Power to the 4160v ES buses supplies motive and control power to equipment required for safe shutdown of the plant and for mitigation and control of accidents.

EGDG-1A not starting and achieving steady state voltage and frequency in less than or equal to 10 seconds from standby conditions upon receipt of a simulated ES signal as required by Technical Specifications was reviewed to determine if the Emergency AC Power System safety function was lost at any time between February 28, 2004, and April 23, 2004. The review concluded that the safety function was never lost. Although the 11.4 second start time exceeded ITS requirements, the delay did not challenge the assumptions of the analysis documented in Calculation N04-0002, "CR-3 Loss of Coolant Accident (LOCA) Summary Report," Revision 0, dated January 28, 2004. Calculation N04-0002, Table 4-1, "LOCA Inputs and Assumptions for CR-3," identifies ES Actuation System (ESAS) [JE] delay times after ESAS Low Reactor Coolant System Trips for Low Pressure Injection (LPI) [BP] and High Pressure Injection (HPI) [BQ] for a Small Break LOCA (SBLOCA) and a Large Break LOCA (LBLOCA). The bounding figure (the minimum assumed delay) is the assumed delay of 35 seconds for LPI during a LBLOCA. (SBLOCA assumes a delay of 40 seconds for LPI and 67 seconds for HPI). The EGDG-1A start time of 11.4 seconds does not challenge that assumption. Adding the 11.4 seconds EGDG-1A start time to the LPI initiation time delay of 15 seconds and LPI pump start time of 5 seconds equals a value of 31.4 seconds. This value is less than the 35 second assumption.

Therefore, had the EGDG-1A slow fast start time condition existed at the same time EGDG-1B was voluntarily removed from service, or if EGDG-1B had become unavailable for any other reason, the safety function of the Emergency AC Power System would not have been lost. One train of the Emergency AC Power System would have been available at all times.

The impact of the identified condition is limited to EGDG-1A. EGDG-1B has demonstrated successful fast start test response times, and engine monitoring data supports the conclusion that the EGDG-1B fuel oil header is remaining primed in standby conditions.

Based on the above discussion, PEF concludes that the EGDG-1A slow fast start time did not represent a reduction in the public health and safety. This event does not meet the Nuclear Energy Institute definition of a Safety System Functional Failure (NEI 99-02, Revision 2).

CAUSE

The cause for this event was fuel oil header outlet check valve DFV-61 leaking by its seat. DFV-61 is a 1/8 inch check valve, Model No. 484-4B-28-2, manufactured by Parker Hannifin Corporation – Hydraulic Valve Division (formerly Teledyne - Republic). This check valve prevents back flow and maintains the pressure boundary of the fuel oil system for the EGDGs. Results of a laboratory analysis performed at the Harris Nuclear Plant Environmental and Engineering Laboratory indicate

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
CRYSTAL RIVER UNIT 3	05000302	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 7
		04	-- 002 --	00	

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

that the failure mechanism was valve leakage due to foreign material lodged between the valve disk and seat.

Laboratory analysis indicates that the primary material composition for each of the various particles falls into one of three categories: clear PolyVinylChloride (PVC); Teflon; and, Iron Oxide. Of the three identified types of foreign material, two are adequately sized and located to be disruptive to the operation of the valve. The clear PVC segment was found lying directly across the molded synthetic rubber seal. The shape of the material is irregular, but narrow and cylindrical, somewhat like the head of an irregular needle or barb. The PVC formed an obstruction that could have been a significant contributor to the valve's malfunction.

The Teflon material was found lying across a portion of the seat area. The Teflon material is a thin, elongated filament, similar to thread sealing tape. This item's size and location indicates that it may also have been interfering significantly with the seating of the valve.

A small red dot found near the PVC has been identified as a fragile Iron Oxide particle. The Iron Oxide particle size is sufficiently small that it was not a significant contributor to the event.

PEF concludes that unintentional introduction of foreign material into the fuel system components during replacement component manufacturing, during component receipt inspection and/or during maintenance activities on February 24, 2004, resulted in the blockage of DFV-61, culminating in the slow fast start of EGDG-1A on April 23, 2004. The most probable source of the clear PVC and the Iron Oxide particle is the transfer process used for the initial fill of the fuel filter cartridges, with the possibility existing that it could also have been introduced in trouble-shooting after the failure.

The most probable source of the Teflon material is concluded to be the manufacturing process, with the possibility existing that it could also have been introduced during receipt inspection.

CORRECTIVE ACTIONS

1. DFV-61 was replaced, SP-354A was performed successfully, and ITS 3.8.1, Condition B, actions were exited at 0457 on April 25, 2004.
2. A review of EGDG-1B fast start test response times and engine monitoring data supports the conclusion that the fuel oil header had been adequately primed in standby conditions.
3. Other actions associated with this event and probable sources of the foreign materials are being addressed in the CR-3 Corrective Action Program in Nuclear Condition Report 125149.

PREVIOUS SIMILAR EVENTS

No previous similar events involving loss of EGDG fuel oil header prime due to foreign material in a fuel oil header discharge check valve have been reported to the NRC by CR-3.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
CRYSTAL RIVER UNIT 3	05000302	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 7
		04	-- 002 --	00	

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

ATTACHMENTS

Attachment 1 - Abbreviations, Definitions, and Acronyms

Attachment 2 - List of Commitments

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
CRYSTAL RIVER UNIT 3	05000302	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	6 OF 7
		04	-- 002 --	00	

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

ATTACHMENT 1

ABBREVIATIONS, DEFINITIONS AND ACRONYMS

AC	Alternating Current
CFR	Code of Federal Regulations
CR-3	Crystal River Unit 3
DFV	Diesel Fuel Valve
EGDG	Emergency Diesel Generator
ES	Engineered Safeguards
ESAS	Engineered Safeguards Actuation System
HPI	High Pressure Injection
ITS	Improved Technical Specifications
LBLOCA	Large Break Loss of Coolant Accident
LOCA	Loss of Coolant Accident
LPI	Low Pressure Injection
MP	Maintenance Procedure
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
PEF	Progress Energy Florida, Inc.
PVC	PolyVinylChloride
SBLOCA	Small Break Loss of Coolant Accident
SP	Surveillance Procedure
v	volt

NOTES: Improved Technical Specifications defined terms appear capitalized in LER text {e.g., MODE 1}

Defined terms/acronyms/abbreviations appear in parenthesis when first used {e.g., Reactor Building (RB)}.

EIIS codes appear in square brackets {e.g., reactor building penetration [NH, PEN]}.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER		3. PAGE
CRYSTAL RIVER UNIT 3	05000302	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER
		04	- 002 -	00
7 OF 7				

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

ATTACHMENT 2

LIST OF COMMITMENTS

The following table identifies those actions committed to by PEF in this document. Any other actions discussed in the submittal represent intended or planned actions by PEF. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Supervisor, Licensing & Regulatory Programs of any questions regarding this document or any associated regulatory commitments.

RESPONSE SECTION	COMMITMENT	DUE DATE
	No regulatory commitments are being made in this submittal.	