



Florida Power

CORPORATION
Crystal River Unit 3
Docket No. 50-302

June 26, 1997
3F0697-26

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

Subject: LICENSEE EVENT REPORT (LER) 97-013-00

Dear Gentlemen:

Please find the enclosed Licensee Event Report (LER) 97-013-00 concerning the potential to exceed the design basis temperature in the Emergency Diesel Generator Room.

This report is submitted in accordance with 10 CFR 50.73.

Sincerely,

J. J. Holden, Director
Nuclear Engineering and Projects

JJH/pmp

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

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EXPIRES 04/30/98

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 500 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

CRYSTAL RIVER UNIT 3

DOCKET NUMBER (2)

05000302

PAGE (3)

1 OF 5

TITLE (4)

Emergency Diesel Generator Room Could Exceed Maximum Design Temperature During Operation Due to Inadequate Room Cooling

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 NAME	DOCKET NUMBER	
05	30	97	97	-- 013 --	00	06	26	97	FACILITY NAME	DOCKET NUMBER	
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
N		20.2201(b)			20.2203(a)(2)(v)			50.73(a)(2)(i)		50.73(a)(2)(viii)	
POWER LEVEL (10)		20.2203(a)(1)									
000		20.2203(a)(2)(i)			20.2203(a)(3)(ii)			X 50.73(a)(2)(ii)		50.73(a)(2)(x)	
		20.2203(a)(2)(ii)			20.2203(a)(4)			50.73(a)(2)(iii)		73 71	
		20.2203(a)(2)(iii)			50.36(c)(1)			50.73(a)(2)(iv)		OTHER	
		20.2203(a)(2)(iv)			50.36(c)(2)			50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A	
								50.73(a)(2)(vii)			

LICENSEE CONTACT FOR THIS LER (12)

NAME

Patrick M. Peterson, Sr. Regulatory Specialist

TELEPHONE NUMBER (Include Area Code)

(352) 795-6486

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)

YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On May 30, 1997, Florida Power Corporation's (FPC) Crystal River Unit 3 (CR-3) was in MODE 5, COLD SHUTDOWN. A reportability determination was made based on a condition previously discovered on February 1, 1997, during a functional test on the emergency diesel generators (EDG). FPC determined a potential exists for the EDG rooms to exceed the design basis temperature of 120 degrees F, when the outside air temperature is 95 degrees F, or greater. Exceeding the 120 degrees F temperature limit in the EDG rooms would result in CR-3 being in a condition outside the design basis. The 120 degrees F limit is to provide an acceptable environment for the electrical equipment in the EDG room. The electrical component temperatures were recorded and evaluated during the functional tests. FPC concluded the components will perform their required function in the increased temperature environment and the EDGs will perform their intended function. There is no impact to the general public health and safety. Inadequate EDG room cooling resulted in a potential to exceed the design basis temperature limits. FPC will improve cooling air flow to the EDG rooms during EDG operation to maintain the temperature at or below 120 degrees F by December 1, 1997.

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

EVENT DESCRIPTION

On May 30, 1997, Florida Power Corporation's (FPC) Crystal River Unit 3 (CR-3) was in MODE 5, COLD SHUTDOWN. A reportability determination was made based on a condition previously discovered on February 1, 1997 during a functional test on the emergency diesel generators (EDG). FPC determined a potential exists for the EDG rooms to exceed the design basis temperature of 120 degrees Fahrenheit (F), when the outside air temperature is 95 degrees F, or greater. Exceeding the 120 degrees F temperature limit in the EDG rooms could result in CR-3 being in a condition outside the design basis. The CR-3 Enhanced Designed Basis Documents (EDBD) state that the EDG rooms are to be maintained at or below 120 degrees F to provide an acceptable environment for the electrical equipment in the room.

The maximum design basis temperature for the EDG room is 120 degrees F. The maximum design basis outside air temperature is 95 degrees F. The difference between the outside air temperature and the EDG room temperature is the delta T. Based on the design conditions, a 25 degree delta T would exist. The delta T method is used to approximate maximum temperatures that could be reached during the functional tests to determine if the temperature for the EDG rooms could exceed 120 degrees F if the outside air temperature was at 95 degrees F.

On February 1, 1997, functional testing performed on EDG-1A indicated that the EDG engine room could potentially exceed the design maximum temperature of 120 degrees F at a maximum load of 3250 kW. The delta T approached but did not exceed 25 degrees. On March 14 and March 15, 1997, a functional test was performed on EDG-1B to confirm the EDG room delta T at various power (kW) levels. The delta T did exceed 25 degrees F for less than 30 minutes. However, the EDG room temperature did not exceed 120 degrees F because the outside air was less than 95 degrees F.

Event Evaluation

The 120 degrees F limit is to provide an acceptable environment for the electrical equipment in the room. The electrical component temperatures were recorded and evaluated during the functional tests. FPC concluded the components will perform their required function in the increased temperature environment and the EDGs will perform their intended function. There is no impact to the general public health and safety.

The temperatures for various components were monitored during the functional tests. The high voltage cabinet briefly exceeded the 120 degrees F limit during operation of the EDG. The increased temperature was primarily due to hot air exiting from the generator and heating the back of the cabinet. This was confirmed during the operation of EDG-1B on May 23, 1997. FPC evaluated the electrical component temperatures and concluded the components will perform their required function.

FPC determined that the back of the high voltage panel is being heated by hot air exhausting from the bottom of the generator and traveling between the back of the panel and the deflector for the generator

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side exhaust air. The temperatures measured in the front of the panel and in the door lip (door was cracked open to simulate ventilation inside the cabinet) were much less than in the back of the panel by 20 degrees F. The lip of the panel measured approximately 100 degrees F to 110 degrees F, the front of the panel measured approximately 96 degrees F to 100 degrees F, while the back of the panel measured approximately 107 degrees F to 130 degrees F. The temperatures measured in the front and the lip of this panel closely relate to what the other electrical panels are experiencing. The components in the high voltage panel were evaluated and are within the temperature ratings for acceptable operation.

The motor starter cabinet for EDG-1B was noted as having a temperature greater than 120 degrees F when the EDG was not running. The cabinet is cooler during operation of the EDG because most components inside the cabinet are de-energized during EDG operation, and the room cooling ventilation system has cooling air blowing directly on the cabinet. This equipment is used to keep the EDG warm while not in operation. The panel had temperatures from 93 degrees F to 104 degrees F in the back and 88 degrees F to 95 degrees F in the front, with the outside air temperature of 73 degrees F to 88 degrees F and generator output of approximately 3200 kW. Therefore, this panel would not see a large increase in temperature at 3250 kW and 95 degrees F outside air. The EDG's also have a thirty minute rating of 3500 kW, but the testing has shown it takes three hours for temperature to stabilize from a power change, therefore the thirty minute rating is not of a concern. The equipment in the panel is within the temperature rating. The Johnson Control panels contain various components with the following temperature ratings:

- Pressure switches [PS] (32 to 140 degrees F)
- Solenoid air valves [FSV] (maximum ambient temperature is 140 degrees F)
- Differential pressure gages (30 to 140 degrees F)
- Differential pressure switch [PDS] (-30 to 130 degrees F)
- Pneumatic damper operator [DMP] (maximum ambient temperature is 150 degrees F)

These temperature ratings are within the measured temperature values during the test. The Johnson Control panels had temperatures ranging from 94 degrees F to 104 degrees F, for outside air temperature ranging from 73 degrees F to 88 degrees F, and generator output of approximately 3200 kW; therefore, these panels would not see a large increase in temperature at 3250 kW and 95 degrees F outside air. The equipment in the panel would be within its temperature rating.

Cause

Inadequate cooling resulted in a potential to exceed design basis temperature limits for the EDG rooms.

Immediate Corrective Actions

Temperature limits were not exceeded, therefore, no immediate corrective action were necessary.

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Corrective Actions

FPC will provide adequate cooling air flow to the EDG rooms during EDG operation to maintain the temperature at or below 120 degrees F during design basis events by December 1, 1997.

Actions to Prevent Recurrence

The increased cooling air flow will maintain the EDG rooms below the designed basis temperature.

Previous Similar Events

LER 91-009-00, dated November 6, 1991, identified components inside the EDG room which identified several relays and fuses in the control relay cabinets in the A and B diesel generator rooms that might experience a temperature higher than their design ambient temperature rating during diesel generator operation.

The cause identified in 1991 was the proximity of the control cabinets to the EDG. Hot exhaust air from the electrical generator air cooling system blows directly on the cabinet containing the diesel generator controls. The corrective actions identified in LER 91-009-00 were to install a combination of heat shields and to provide ventilation cooling directly to the control cabinets involved.

The Corrective Actions completed for LER 91-009-00 addressed the control relay cabinets and did not include the electrical equipment identified in LER 97-013-00.

Attachments

Attachment 1 Abbreviations, Definitions and Acronyms

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ATTACHMENT 1 - ABBREVIATIONS, DEFINITIONS, AND ACRONYMS

- LER Licensee Event Report
- FPC Florida Power Corporation
- CR-3 Crystal River Unit 3
- EDG Emergency Diesel Generator
- kW Kilo-watt
- EDG AH Emergency Diesel Generator Air Handling System
- delta T The difference between two temperatures (outside air and inside air)

Note: Improved Technical Specifications terms appear in capitalization in the text of the LER. EISS Codes appear in square brackets.