



Crystal River Nuclear Plant
15760 W. Power Line Street
Crystal River, FL 34428

Docket 50-302
Operating License No. DPR-72

10 CFR 50.73

July 25, 2013
3F0713-02

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

Subject: Crystal River Unit 3 – Licensee Event Report 50-302/2013-001-00

Dear Sir:

In accordance with 10 CFR 50.73(a)(2)(iv)(A), Duke Energy Florida, Inc., formerly known as Florida Power Corporation, hereby submits Licensee Event Report (LER) 50-302/2013-001-00 for Crystal River Unit 3. This LER discusses the valid actuation of an Emergency Diesel Generator due to a spurious fault on a breaker non-segregated bus duct.

No new regulatory commitments are made in this letter.

If you have any questions regarding this submittal, please contact Mr. Dan Westcott, Licensing Supervisor, at (352) 563-4796.

Sincerely,



John Elnitsky, Vice President
Project Management and Construction

JE/dwh

Attachment

xc: NRR Project Manager
Regional Administrator, Region II

JE22
NRR

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 an 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 05000302	3. PAGE 1 of 7
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4. TITLE
Valid Actuation of an Emergency Diesel Generator Due to a Spurious Fault on a Breaker Non-Segregated Bus Duct

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
06	01	2013	2013	- 001 -	00	07	25	2013		05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE No Mode	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)									
10. POWER LEVEL 0%	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER							
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Dennis W. Herrin, Lead Licensing Engineer	TELEPHONE NUMBER (Include Area Code) 352-563-4633
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
D	EA	NSBU	C048	Y					

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR

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

At 21:29, on June 1, 2013, Crystal River Unit 3 (CR-3) was in NO MODE (core permanently off loaded for decommissioning) at 0 percent RATED THERMAL POWER when a spurious fault above Breaker 3104 (Startup Transformer (SUT) feed to the "B" Unit 6.9 kilovolt (kV) non-segregated bus) occurred. Protective relaying de-energized the SUT and the Backup Engineered Safeguards Transformer, which de-energized the "B" Engineered Safeguards (ES) 4160 volt (V) bus. All relays operated as designed. The "B" Emergency Diesel Generator automatically started and re-energized the "B" ES 4160V bus, as designed. The only credible accidents for CR-3 are a Fuel Handling Accident and a Waste Gas Decay Tank (WGDT) Rupture Accident. At the time of the spurious fault, the Spent Fuel Pools (SFPs) were being cooled by the "A" SFP pump. The SFPs and WGDTs were unaffected. This condition does not represent a reduction in the public health and safety. Valid actuation of an Emergency Diesel Generator is reportable under 10 CFR 50.73(a)(2)(iv)(A). The cause for the fault was lack of a bus duct internal seal inspection Preventive Maintenance (PM) task which led to undetected condensate accumulation and formation of a conductive bridge to ground causing the bus fault. An internal seal inspection criterion is being developed. Similar occurrences have not been previously reported to the NRC.

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EVENT DESCRIPTION

At 21:29, on June 1, 2013, Duke Energy Florida, Inc., (DEF) Crystal River Unit 3 (CR-3) was in NO MODE (core permanently off loaded for decommissioning) at 0 percent RATED THERMAL POWER when a spurious fault above (on the line side of) Breaker 3104 (Startup Transformer (SUT) [EB, XFMR] feed to the "B" Unit 6.9 kilovolt (kV) non-segregated bus (MTBD-13A [EA, NSBU])) [EA, BKR] occurred. At the time of the fault, Breaker 3104 was open; therefore, no overcurrent condition occurred on the load side of the breaker. Protective relaying de-energized the SUT and the Backup Engineered Safeguards Transformer (BEST) [EB, XFMR], which de-energized the "B" Engineered Safeguards (ES) 4160 volt (V) bus [EB, BU]. The "B" Emergency Diesel Generator (EGDG-1B) [EK, DG] started and re-energized the "B" ES 4160V bus. (Figure 1 is a simplified distribution diagram that shows the breaker alignment immediately prior to the event.)

MTBD-13A is fed from the SUT which is supplied by the 230kV offsite power switchyard bus [EA, BU]. All three SUT differential relays [EA, 87] actuated. This caused the SUT lockout relays (LORs) [EA, 86] to operate, which in turn, operated the BEST master relay LORs. The appropriate breakers were opened by the LORs, including 230kV Breakers 1691 and 1692 [EA, BKR]. All relays operated as designed. EGDG-1B automatically started on a valid signal and loaded, as designed.

At 04:38, on June 2, 2013, an 8-hour notification was made to the Nuclear Regulatory Commission (NRC) Operations Center in accordance with 10 CFR 50.72(b)(3)(iv)(A) for valid actuation of an Emergency Diesel Generator. This condition is also reportable as a 60-day Licensee Event Report under 10 CFR 50.73(a)(2)(iv)(A).

CAUSE

The exact location of the fault was determined to be at the lowest seal plate in the non-segregated bus duct [EA, BDUC] above (on the line side of) Breaker 3104. The failure caused extensive damage to the switchgear cubicle, the bus duct surrounding the bus bars, and portions of the bus bars. The switchgear cubicle door was blown open during the event, shearing and bending the hinges on the door. The vertical bus duct connected to the upper portion of the switchgear cubicle was deformed outward breaking numerous riveted and bolted connections. The non-segregated bus duct was manufactured by the Calvert Company (AZZ Calvert).

The root cause for the fault is identified as the lack of a Calvert bus internal penetration seal Preventive Maintenance (PM) task which led to undetected condensate accumulation and formation of a conductive bridge to ground causing the bus fault. Failure of MTBD-13A occurred as a phase-to-ground fault. Inspections after the fault revealed signs that moisture had accumulated. A deficient internal penetration seal allowed moisture to accumulate inside the bus. Previous inspections of MTBD-13A did not reveal the deficient penetration seal due to lack of a PM task to inspect the internal penetration seal. The deficient penetration seal subsequently allowed warm, humid air to enter the Calvert bus duct in a temperature controlled environment. Warm, humid air then cooled, causing condensation to accumulate within the bus duct and creating a conductive bridge to ground.

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Prior to the bus fault, the environment in the switchgear room where the damage occurred was inadvertently primed for increased condensation formation when the Appendix R Chiller [VF, CHU] supplying cool air to the room was returned to service after being inoperable for several weeks. One of the cool air returns exhausts directly on/towards MTBD-13A. This was determined to have contributed to the fault, but was not the root cause of the event.

SAFETY CONSEQUENCES

CR-3 has been safely shutdown since September 26, 2009, when the plant entered the Cycle 16 refueling outage to replace the steam generators [AB, SG]. Since September 26, 2009, fuel was reloaded into the reactor vessel [AB, RPV] from the Spent Fuel Pools (SFPs) [DA] once in anticipation of unit restart. However, restart was subsequently deferred and the fuel was off loaded to the SFPs where it currently resides. The final removal of fuel from the reactor vessel was completed on May 28, 2011. No fuel has been used in the reactor vessel for power generation since the CR-3 shutdown began on September 26, 2009.

On February 20, 2013, DEF informed the NRC that CR-3 had permanently ceased operations and that the fuel had been permanently removed from the reactor vessel. On March 13, 2013, the NRC acknowledged the CR-3 certificate of permanent cessation of power operation and permanent removal of fuel from the reactor vessel. Therefore, pursuant to 10 CFR 50.82(a)(2), the 10 CFR 50 license for CR-3 no longer authorizes operation of the reactor or emplacement or retention of fuel in the reactor vessel.

Final Safety Analysis Report Change Package 2013-0008 was approved on June 5, 2013. Chapter 14, "Safety Analysis," was revised to remove core and coolant boundary protection analyses and standby safeguards analyses for transients and accidents that are no longer credible for a plant that has permanently ceased operation and removed all fuel from the reactor. The only remaining credible accidents analyzed are a Fuel Handling Accident and a Waste Gas Decay Tank (WGDT) [WE, TK] Rupture Accident.

At the time of the spurious fault, the SFPs were being cooled by the "A" SFP pump [DA, P]. Although failure of MTBD-13A caused extensive damage to the switchgear cubicle, the bus duct surrounding the bus bars, and portions of the bus bars, the SFPs and WGDTs were unaffected.

DEF concludes that the failure of MTBD-13A did not represent a reduction in the public health and safety.

CORRECTIVE ACTIONS

1. The faulted portion of MTBD-13A, the SUT and the BEST were isolated on 06/01/2013 through protective relaying.
2. Both ES 4160V buses were aligned to the Offsite Power transformer on 06/02/2013.
3. EGDG-1B was secured and restored to a standby condition on 06/02/2013.

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4. Additional corrective actions developed as part of the root cause evaluation are being tracked in the CR-3 Corrective Action Program under Condition Report (CR) 609671 and include, but are not limited to:

- a. Determine whether or not the faulted portion of MTBD-13A will be repaired based on the long term electrical alignment of CR-3 not requiring the equipment.
- b. Perform the inspections/testing for the other Calvert bus installations with similar configurations as MTBD-13A. Repair any identified damage as necessary.
- c. Revise the model PM task for the Calvert bus detailed internal inspection of sections (MTBD-12A/B/C/D/E/F/G/H and MTBD-13A/B) to include specific inspection criteria for internal penetration seals.

ADDITIONAL INFORMATION

The 7.2kV, 2,000 amp, non-segregated bus duct is manufactured by the Calvert Company.

PREVIOUS SIMILAR EVENTS

Licensee Event Report (LER) 50-302/1985-028-00 documents the failure of a 6.9kV Unit Auxiliary Bus that caused the loss of two Reactor Coolant Pumps (RCPs) [AB, P], a Reactor Trip and actuation of the Emergency Feedwater Initiation and Control System [BA]. However, the cause for the failure was identified as a loose connection that was found on the "A" phase upper and lower lead assembly on the bus side of the "D" RCP motor breaker [EA, BKR] in the "B" 6.9kV Unit Auxiliary Bus switchgear [EA, SWGR].

No other previous similar occurrences have been reported by CR-3 to the NRC in a LER.

ATTACHMENTS

Attachment 1 - Abbreviations, Definitions, and Acronyms

Attachment 2 - List of Commitments

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Figure 1

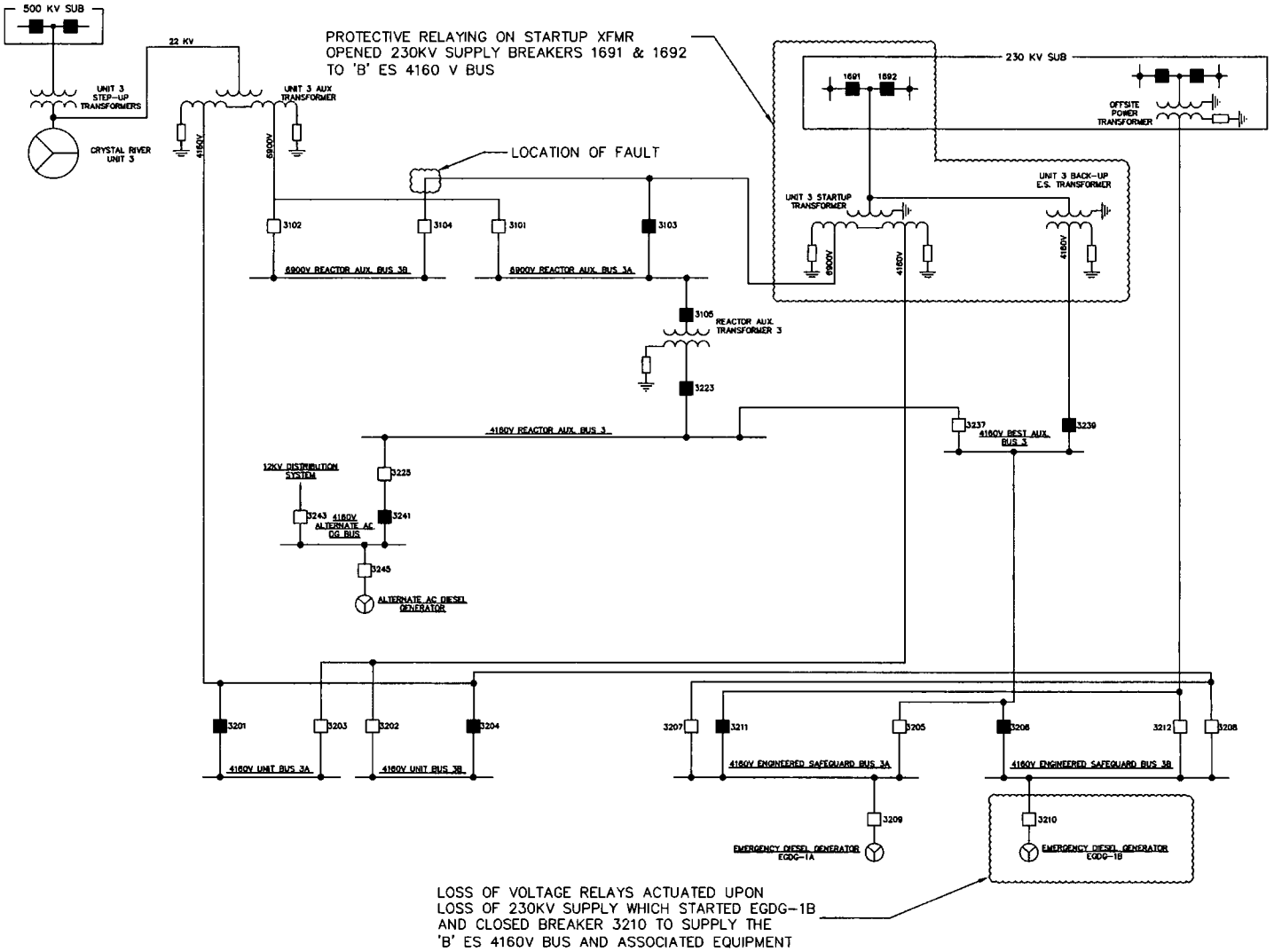


Figure 1: Breaker Alignment Shown Immediately Prior to Event

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ATTACHMENT 1

ABBREVIATIONS, DEFINITIONS AND ACRONYMS

BEST	Backup Engineered Safeguards Transformer
CFR	Code of Federal Regulations
CR	Condition Report
CR-3	Crystal River Unit 3
DEF	Duke Energy Florida, Inc.
EGDG	Emergency Diesel Generator
ES	Engineered Safeguards
kV	Kilovolt
LER	Licensee Event Report
LOR	Lockout Relay
MTBD	MT System Bus Duct
NRC	Nuclear Regulatory Commission
PM	Preventive Maintenance
RCP	Reactor Coolant Pump
SFP	Spent Fuel Pool/Spent Fuel Pump
SUT	Startup Transformer
V	Volt
WGDT	Waste Gas Decay Tank
□	Breaker Open (Figure 1)
■	Breaker Closed (Figure 1)

NOTES: Improved Technical Specification 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)}.

Energy Industry Identification System (EII) codes appear in square brackets {e.g., reactor building penetration [NH, PEN]}

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ATTACHMENT 2

LIST OF COMMITMENTS

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

COMMITMENT	DUE DATE
No new regulatory commitments are contained in this submittal.	N/A