



**Florida
Power**
CORPORATION

Crystal River Unit 3
Docket No. 50-302

April 28, 1993
3F0493-14

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Subject: Licensee Event Report (LER) 93-02

Dear Sir:

Enclosed is Licensee Event Report (LER) 93-02 which is submitted in accordance with 10 CFR 50.73.

Sincerely,

G. L. Boldt
Vice President
Nuclear Production

EEF:mag

Enclosure

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

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PDR ADOCK 05000302
S PDR

A Florida Progress Company

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EXPIRES 4/30/92

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HOURS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON DC 20503.

FACILITY NAME (1)	CRYSTAL RIVER UNIT 3 (CR-3)	DOCKET NUMBER (2)	0 5 0 0 0 3 0 2	PAGE (3)	1 OF 0 3
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TITLE (4)	Switchyard Cable Failure Caused Degraded Voltage of Class 1E Electrical Busses and Actuation of Emergency Diesel Generators
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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)								
0	3	2	9	3	0	0	2	0	0	4	2	8	9	3	N/A	0	5	0	0	0

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (CHECK ONE OR MORE OF THE FOLLOWING) (11)													
POWER LEVEL (10)	0	0	0	20.402(b)	20.405(c)	X	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)		50.73(a)(2)(vii)	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)								
				20.405(a)(1)(iv)	50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)								
			20.405(a)(1)(v)	50.73(a)(2)(iii)		50.73(a)(2)(x)									

LICENSEE CONTACT FOR THIS LER (12)

NAME	W. A. Stephenson, Nuclear Safety Supervisor	TELEPHONE NUMBER	9 0 4 7 9 5 - 6 4 8 6
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
X	F	K	C B L U	0 0 0	NO				

SUPPLEMENTAL REPORT EXPECTED (14)

X	YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	EXPECTED SUBMISSION DATE (15)	0	1	3	0	9	4
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On March 29, 1993, Crystal River Unit 3 was in MODE 5, COLD SHUTDOWN. All electrical power was being supplied via backfeed from the 500KV switchyard. At 0151, the output breakers opened interrupting the backfeed. Both Emergency Diesel Generators started and energized their respective Engineered Safeguards busses.

During the loss of one of the two available offsite power sources, decay heat removal cooling stopped and was restarted five minutes later when the alternate source of power reenergized the safety related busses. During the time decay heat removal was not available reactor coolant temperature increased a maximum of approximately 14°F near the center of the core, while temperatures near the core barrel increased substantially less. Maximum temperature reached was 108°F. The offsite power transformer supplying power from the 230KV switchyard was available as an offsite power source during the entire evolution.

Salt water entered switchyard cable trenches as the result of a winter storm. Salt water immersion of a cable, which apparently contained degraded or damaged cable insulation, is suspected to have contributed to the cable failure, subsequent actuation of relays which opened breakers, and loss of one of two available offsite power sources. Specific corrective actions are still being developed.

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LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 50.0 HOURS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON DC 20503.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)	PAGE (3)
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	0 5 0 0 0 3 0 2	9 3 0 0 2 0 0	0 2 OF 0 3

TEXT (If more space is required, Use additional NRC Form 365A's (17))

EVENT DESCRIPTION:

On March 29, 1993, Crystal River Unit 3 was in MODE 5, COLD SHUTDOWN. Reactor Coolant System (RCS) [AB] temperature was approximately 94°F. All electrical power was being supplied via backfeed from the 500KV switchyard [FK] through the output breakers [EL, BKR], stepup (Output) transformer [EL, XFMR] and auxiliary transformer [EL, XFMR]. The startup transformer [E, XFMR] was out of service due to maintenance and modification activities. The other offsite power source available at this time was the offsite power transformer [EB, XFMR]. This transformer supplies power from the 230KV switchyard [FK] to the Engineered Safeguards (ES) busses [EB/ED, BU]. The offsite power transformer does not provide power to the non-ES busses [EA/EC, BU].

At 0151, the output breakers opened resulting in the loss of one of the two available offsite power sources. All ES busses and non-ES busses deenergized. Relays [EB, 27] which monitor ES bus voltages sensed the loss of power and issued a start command to the Emergency Diesel Generators (EDG) [EK, DG]. Both EDGs started and energized their respective ES busses.

When the ES busses deenergized, the operating Decay Heat (DH) removal pump [BP, P] tripped. At 0156, after verifying availability of power and condition of equipment, operators promptly restarted the "B" DH pump and restored DH removal in accordance with plant procedures.

At 0228, operators aligned the "A" ES bus to the 230KV switchyard via the offsite power transformer and began steps to secure the "A" EDG. Operators then aligned power to the "A" 480V Reactor Auxiliary Bus [EC, BU]. This allowed them to operate 480V equipment not normally powered from the ES busses. At 0258, operators transferred the "B" ES bus to the offsite power transformer and began steps to secure the "B" EDG.

The event was reported to the Nuclear Regulatory Commission at 0225 on March 29, 1993 via the Emergency Notification System per the requirements of 10CFR50.72(b)(2)(ii). This report is submitted in accordance with 10CFR50.73(a)(2)(iv).

EVENT ANALYSIS

All equipment functioned as designed during this event. Both EDGs started and energized their respective ES busses within the required time span.

During the loss of one of the two available offsite power sources, DH removal cooling stopped and was restarted five minutes later when alternate source of power reenergized the safety related busses. During the time DH removal was not available, RCS temperature, as measured at the core [AC] exit, increased a maximum of approximately 14°F near the center of the core, while temperatures near the core

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TEXT (If more space is required, Use additional NRC Form 305A's (17))

barrel increased substantially less. Maximum temperature reached was 108°F. Adequate subcooling existed at all times.

CAUSE

On March 13, 1993, a severe winter storm crossed the Florida coast. The resulting storm surge caused flooding of the 230KV and 500KV switchyards. Salt water from the extreme storm surge filled cable trenches [FK] in the two switchyards. These trenches contain 480VAC and 120VDC power and control cables [FK, CBL] which feed relays [FK, RLY], breakers [FK, BKR], and other equipment in the switchyards.

Salt water immersion of one of the 480V cables, which apparently contained degraded or damaged cable insulation [FK, ISL], is suspected to have contributed to the failure of the cable resulting in arcing which damaged adjacent cables. The resulting electrical transients actuated protective relays [FK, RLY] which caused the output breakers to open and the subsequent loss of one of the two available offsite power sources.

CORRECTIVE ACTION

The damaged cables were replaced and other cables were tested and replaced as necessary. Corrective action to preclude recurrence is still being developed. Alternatives being considered include modification to switchyard cable trenches. These modifications may include separating 480V and 120V cables.

PREVIOUS SIMILAR EVENTS

This was the first interruption of offsite power that can be attributed to the loss of 500KV backfeed. On four previous occasions, offsite power was interrupted due to loss of power feeds from the 230KV switchyard.