NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
CRYSTAL RIVER UNIT 3	0 5 0 0 0 3 0 2	1 OF 0 4

TITLE (4)
LOSS OF DECAY HEAT REMOVAL CAPABILITY

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)
									N/A	0 5 0 0 0
0 2	0 2	8 6	8 6	— 0 0 3	— 0 0	0 3	0 4	8 6	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)	50.73(a)(2)(iii)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(iv)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(v)	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)(vii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(vii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
L. W. Moffaff, Nuclear Safety Supervisor	9 0 4 7 9 5 - 6 4 8 6

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	
X	B P	P	W 3 1 8	Yes							
X	B P	I S V	C 2 5 5	Yes							

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		0 5	1 5	8 6

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

On February 2, 1986, Crystal River Unit 3 was in Mode 5 while performing repairs on a reactor coolant pump. The Reactor Coolant System was vented to the reactor building atmosphere and reactor coolant level was below the level of the reactor coolant pumps. Reactor coolant temperature was being maintained at approximately 98 degrees F. by the "B" train of the Decay Heat Removal System. At 2148 hours, decay heat pump 1B tripped due to a motor overload. Start-up of the redundant train was delayed for approximately 24 minutes because an isolation valve on the suction side of decay heat pump 1A could not be opened from the control room. The valve was manually opened and Decay Heat Removal System operation was restored at 2212 hours. Reactor coolant temperature reached 131 degrees F. during the event. On February 14, 1986, the "B" train of the Decay Heat Removal System was being refilled in preparation for operability testing. During the refilling process movement of the pump and piping was noticed when water was admitted to the system. Examination of pipe restraints in the Decay Heat Removal System revealed that several restraints in the vicinity of decay heat pump 1B were loose or damaged.

The damaged equipment has been repaired and failure analyses are underway to determine whether further corrective actions should be considered.

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
CRYSTAL RIVER UNIT 3	0 5 0 0 0 3 0 2	8 6	— 0 0 3	— 0 0	0 2 OF 0 4

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

EVENT DESCRIPTION

On February 2, 1986, Crystal River Unit 3 was in Mode 5 (Cold Shutdown) while performing repairs on a reactor coolant pump [AB, P]. The Reactor Coolant System was vented to the reactor building atmosphere and reactor coolant level was below the level of the reactor coolant pumps. Reactor coolant temperature, measured at the incore thermocouples, was being maintained at approximately 98 degrees F. by the "B" train of the Decay Heat Removal System [BP]. At 2148 hours, decay heat pump 1B [BP, P] (DHP-1B) tripped due to a motor overload. Action was immediately taken to place the "A" train of the Decay Heat Removal System in operation. Start-up of the "A" train was delayed for approximately 24 minutes because isolation valve DHV-39 [BP, ISV] on the suction side of decay heat pump 1A [BP, P](DHP-1A) could not be opened from the control room (see Figure 1). Valve DHV-39 was manually opened and Decay Heat Removal System operation was restored at 2212 hours. The reactor coolant temperature reached 131 degrees F. during the period that decay heat removal capability was unavailable.

On February 14, 1986, following repairs to DHP-1B, the "B" train of the Decay Heat Removal System was being refilled in preparation for operability testing. Personnel observing the refilling process noticed movement of the pump and piping when water was admitted to the system. Examination of pipe restraints [BP, H] in the Decay Heat Removal System revealed that several restraints in the vicinity of DHP-1B were loose or damaged.

CAUSE

The motor of DHP-1B overloaded and tripped as a result of a failed pump shaft. The cause of the shaft failure is unknown. It is suspected that the pipe hanger damage occurred when the pump failed. The reason for the inability to open DHV-39 from the Control Room is also unknown. The causes of these failures are under investigation and will be the subject of a supplement to this report.

SAFETY CONSIDERATIONS

The loss of a single train of the Decay Heat Removal System (failure of DHP-1B) did not compromise plant safety. The inability to open valve DHV-39, combined with the failure of DHP-1B, caused both trains of the Decay Heat Removal System to be unavailable. This is not a desirable plant condition. There are several alternative methods available to remove decay heat which do not rely upon the Decay Heat Removal System. Therefore, this event did not present an immediate safety threat.

CORRECTIVE ACTIONS

Decay Heat Pump 1B has been repaired and the broken shaft is undergoing analysis to determine the cause of its failure. Pipe restraint repairs have been completed and the "B" train of the Decay Heat Removal System has been restored to operability. Repairs to isolation valve DHV-39 were delayed while the "B" train was inoperable. Repairs will be completed prior to resumption of power operation.

SIMILAR PREVIOUS EVENTS

There have been three (3) previous decay heat pump shaft failures at Crystal River Unit 3. These failures were all experienced on decay heat pump 1A and attributed to a distorted waterway in the pump casing.

Inability to open decay heat pump suction valves DHV-3 and DHV-4 (drop line isolation valves) has occurred on several previous occasions. Problems opening DHV-39 against high differential pressure have been encountered, however, no other types of failures have been documented. Isolation valve DHV-39 was originally a manually operated valve. Its motor operator was installed in response to a NUREG 0578 item.

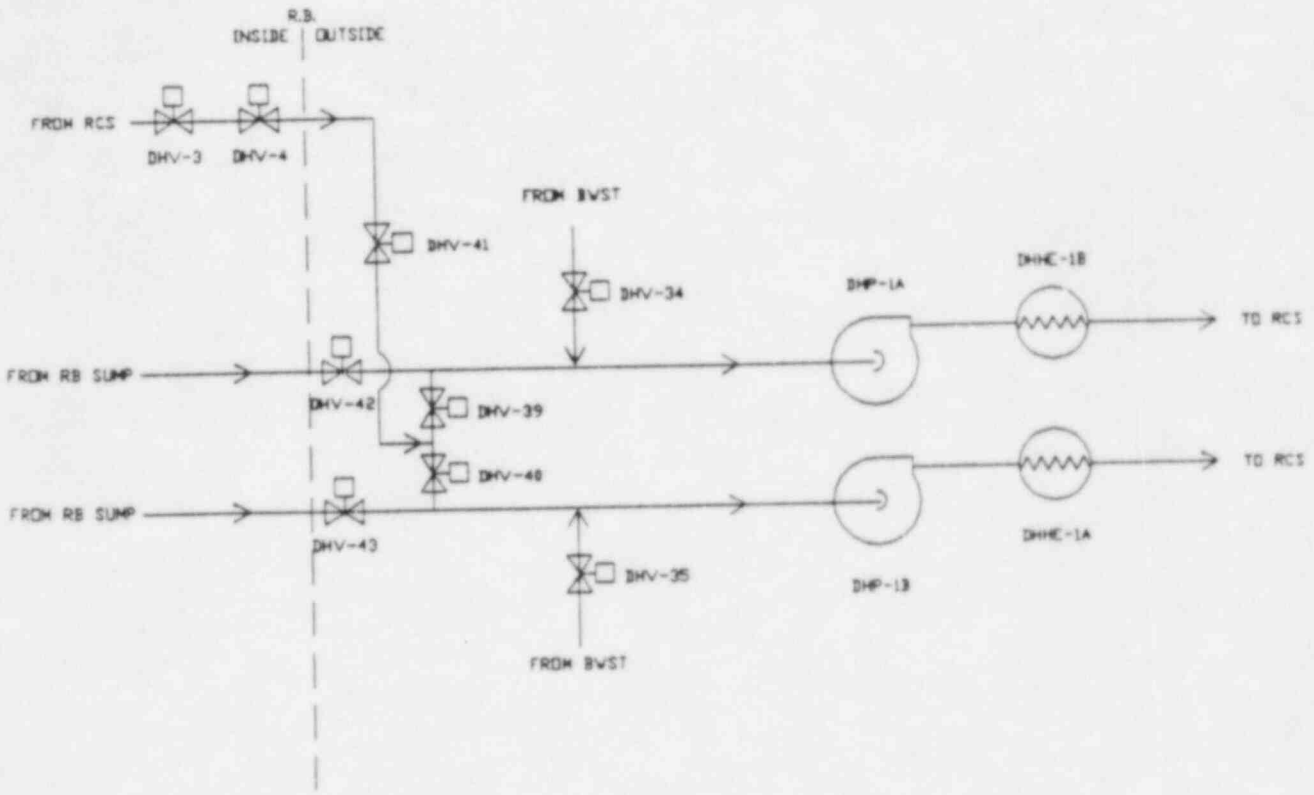
R.B.
INSIDE
OUTSIDE
FROM RCS
DHV-3
DHV-4
FROM BWST
DHV-41
DHV-34
DHHE-1B
DHP-1A
TO RCS
FROM RB SUMP
DHV-42
DHV-39
DHV-40
FROM RB SUMP
DHV-43
DHV-35
DHP-1B
DHHE-1A
TO RCS
FROM BWST

FIGURE 1

Florida Power
CORPORATION

March 4, 1986
3F0386-02

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
Licensee Event Report No. 86-003-00

Dear Sir:

Enclosed is Licensee Event Report (LER) No. 86-003-00 which is submitted in accordance with 10 CFR 50.73.

Should there be any questions, please contact this office.

Sincerely,

G. R. Westafer

G. R. Westafer
Manager, Nuclear Operations
Licensing and Fuel Management

AEF/feb

Enclosure

xc: Dr. J. Nelson Grace
Regional Administrator, Region II
Office of Inspection & Enforcement
U.S. Nuclear Regulatory Commission
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Atlanta, GA 30323

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