

LICENSEE EVENT REPORT (LER)

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

TITLE (4)
LOSS OF DECAY HEAT REMOVAL SYSTEM HEAT SINK DUE TO DIVER FATALITIES

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 1	1 0	8 6	8 6	0 0 2	0 0	0 2	1 9	8 6	N/A		0 5 0 0 0
									N/A		0 5 0 0 0

OPERATING MODE (9) 5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)											
	20.402(b)			20.406(c)			50.73(a)(2)(iv)			73.71(b)		
	20.406(a)(1)(i)			50.36(e)(1)			50.73(a)(2)(v)			73.71(a)		
	20.406(a)(1)(ii)			50.36(e)(2)			50.73(a)(2)(vi)			OTHER (Specify in Abstract below and in Text, NRC Form 366A)		
	20.406(a)(1)(iii)			50.73(a)(2)(i)			50.73(a)(2)(viii)(A)					
	20.406(a)(1)(iv)			50.73(a)(2)(ii)			50.73(a)(2)(viii)(B)					
20.406(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(x)						

LICENSEE CONTACT FOR THIS LER (12)									
NAME L. W. MOFFATT, NUCLEAR SAFETY SUPERVISOR									
TELEPHONE NUMBER 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 NPDs	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs	CAUSE	SYSTEM

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

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

On January 10, 1986, Crystal River Unit 3 was in Mode 5 during an outage. The intake structure was being cleaned and inspected by two contract divers. At approximately 1615, one diver failed to reappear following this dive. The second diver attempted to locate and rescue the missing diver but was himself drowned. When the second diver was reported to be in trouble, all seawater pumps taking suction at the intake structure were secured, thus disabling both trains of the Decay Heat Removal System. The body of the second diver was recovered shortly thereafter. The first diver was found to have been drawn into the 48" suction line to the "A" Emergency Nuclear Services and Decay Heat Seawater System pumps (both pumps were running at the start of the event). The body of the first diver was recovered in the Auxiliary Building.

All seawater pumps were voluntarily secured and/or disabled in an attempt to prevent loss of life.

8602240687 860219
PDR ADOCK 05000302
S PDR

le 22
1/1

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMR NO 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1):

DOCKET NUMBER (2):

LER NUMBER (6):

PAGE (3):

CRYSTAL RIVER UNIT 3

0 15 10 0 0 0 3 0 2

YEAR

SEQUENTIAL

REVISION

NUMBER

NUMBER

NUMBER

8 6

- 0 0 2

- 0 0 0 2

OF 0 5

TEXT (7) more space is required, use additional NRC Form 366A 2/177

EVENT DESCRIPTION

On the afternoon of January 10, 1986, Crystal River Unit 3 was in Mode 5 during a maintenance outage. The Reactor Coolant System (RCS) [AB] was cooled by the "A" Decay Heat Removal (DHR) [BP] loop and temperatures were stable. The "A" decay heat seawater pump (RWP-3A) [BS, P] provided the heat sink for the "A" DHR loop. Various plant loads were supplied with cooling water from the Nuclear Services Closed Cycle Cooling Water System (SW) [CC], with the "A" emergency nuclear services seawater pump (RWP-2A) [BS, P] providing the heat sink. One of the maintenance items being performed was cleaning and inspection of the underwater areas of the intake structure. A contract diving firm, Dive-Tech International, had supplied two persons to perform this underwater cleaning and inspection. During the morning and early afternoon of January 10, 1986, the two divers performed a series of dives at the intake structure using SCUBA equipment. They removed debris, checked main circulating water pump impeller clearances, and inspected the general area of the intake structure. Refer to Figure 1 for details on the location of the pumps mentioned above.

At approximately 1615 on January 10, 1986, one of the contract divers began a dive, alone and untethered, at the intake structure. The dive was intended to be a final check of the areas cleaned throughout the day. At approximately 1630, personnel supporting the intake structure work notified the control room that this diver had not returned from his dive. The second diver then began searching for the missing diver but could not locate him. At 1635, the control board operator de-energized the "A" emergency nuclear services seawater pump (RWP-2A). This action was taken based on the knowledge that a diver was missing and a load fluctuation noted on RWP-2A by the control board operator. At this time the control room operations staff did not know where the divers had been operating and believed the diving operations to have been restricted to the area between the trash racks and the traveling screens. The "A" decay heat seawater pump (RWP-3A) continued to run to provide a heat sink for the "A" DHR loop.

At approximately 1635, the second diver tethered himself to the access ladder at the dive entry point and continued searching for the missing diver. At 1646 the control board operator voluntarily de-energized the "A" decay heat seawater pump (RWP-3A) upon receiving notification the second diver was apparently experiencing difficulties. At this time all seawater pumps were de-energized and the Decay Heat Removal System had no heat sink.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1): CRYSTAL RIVER UNIT 3	DOCKET NUMBER (2): 015101010302	LER NUMBER (6):			PAGE (3):		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		816	0102	010	013	OF	015

TEXT (If more space is required, use additional NRC Form 365A 21 (17)).

Between 1638 and 1703, the operations staff disabled all the de-energized seawater pumps by opening the pump circuit breaker DC control power knife switches. This action was taken to preclude any chance of a manual or automatic start of these pumps.

At 1707 the control board operator started the RC System Heatup and Cooldown Surveillance Procedure with an initial temperature of 103.5 Fahrenheit degrees. During the period between 1707 and 1800, the average DHR heatup rate was 35.7 Fahrenheit degrees per hour. Attempts were made to supply cooling water via cross-connect lineups between the Decay Heat Closed Cycle Cooling Water System (DC) [CC], the Nuclear Services Closed Cycle Cooling Water System (SW), and Industrial Cooling (CI) [KM]. Of these three cooling water systems, only CI does not require an operating seawater pump to provide a heat sink, and CI could not rapidly be cross-connected to the DC System.

During the period between 1800 and 1900, the average DHR heatup rate was 32.3 Fahrenheit degrees per hour, with the DHR temperature at 1900 at 167.3 degrees Fahrenheit. At 1840 the Nuclear Plant Manager voluntarily declared an Unusual Event. The Technical Support Center was voluntarily manned (although not formally activated) to provide any technical assistance required. At 1922 the idle "B" trains of DC and DHR were placed in service in order to take advantage of the ambient temperatures in these trains. This action lowered overall DHR system temperatures by approximately ten Fahrenheit degrees; however, the heatup then continued at the same rate of about 30 Fahrenheit degrees per hour. By 1935, the bodies of both divers had been recovered. The "B" decay heat seawater pump (RWP-3B) [BS, P] was enabled and energized to restore the heat sink for the "B" DHR loop. The Unusual Event was exited at 2000 on January 10, 1986.

This event was initially determined to be unreportable in accordance with 10 CFR 50.73. Discussions between site organizations subsequently determined on February 10, 1986, that this event was in fact reportable under 10 CFR 50.73 a.2.v and 10 CFR 50.73 a.2.vii and that the report should have gone to the NRC by February 10, 1986. A submittal dated February 10, 1986 provided notification the LER would be delayed.

CAUSE

All seawater pumps were voluntarily secured and/or disabled in an attempt to prevent loss of life.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

TEXT (If more space is required, use additional NRC Form 255A 2/17)

ANALYSIS OF EVENT

The reactor was shut down with all rods fully inserted and sufficient shutdown margin throughout the event.

Forced convection using the "A" and "B" DHR loops was maintained throughout the event; however, these loops were without a heat sink for a period of two hours and forty-nine minutes. During the period when RWP-3A and RWP-3B were both secured, the DHR system heated up approximately 71 Fahrenheit degrees and reached an indicated peak DHR temperature of 174.4 degrees Fahrenheit (185 degrees Fahrenheit by incoré temperature indication). Using the higher of the above peak temperatures and noting DHR/RCS pressure to have been nearly atmospheric pressure, this gives a subcooling margin of approximately 27 Fahrenheit degrees. Had it become absolutely necessary to provide further DHR/RCS cooling, the "B" raw water pit and RWP-3B could have been used much earlier in the event than it actually was; however, the decision was made to keep all seawater pumps off until both divers were recovered. Additional means of cooling the DHR/RCS were available throughout the event. These means involved use of the ambient temperature water in the spent fuel pool (SFP) [DA, TK] and borated water storage tank (BWST) [BP, TK] in various recirculation lineups using the Makeup and Purification System [CB] and/or Spent Fuel Cooling System [DA]. These methods could provide large quantities of ambient SFP or BWST water to the operating DHR loop upstream of the reactor while recirculating the warmer water downstream of the reactor back to the SFP or BWST.

No radioactivity was released from Crystal River Unit 3 as a result of this event.

All safety systems and equipment required by Technical Specifications were available during this event. All seawater pumps were voluntarily secured and/or disabled in an attempt to prevent loss of life. No safety systems or equipment were damaged by this loss of seawater flow.

For the reasons above, this event had no impact on the health and safety of the general public.

CORRECTIVE ACTIONS

No corrective actions associated with the voluntary disabling of the Decay Heat Removal System heat sink, in an attempt to prevent loss of life, are deemed necessary.

PREVIOUS SIMILAR EVENTS

This is the first LER submitted for voluntarily disabling the Decay Heat Removal System heat sink.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)

CRYSTAL RIVER UNIT 3

DOCKET NUMBER (2)

0 1 5 | 0 | 0 | 0 | 3 | 0 | 2

LER NUMBER (6)

YEAR	SEQUENTIAL NUMBER	REVISION NUMBER
81	6	0

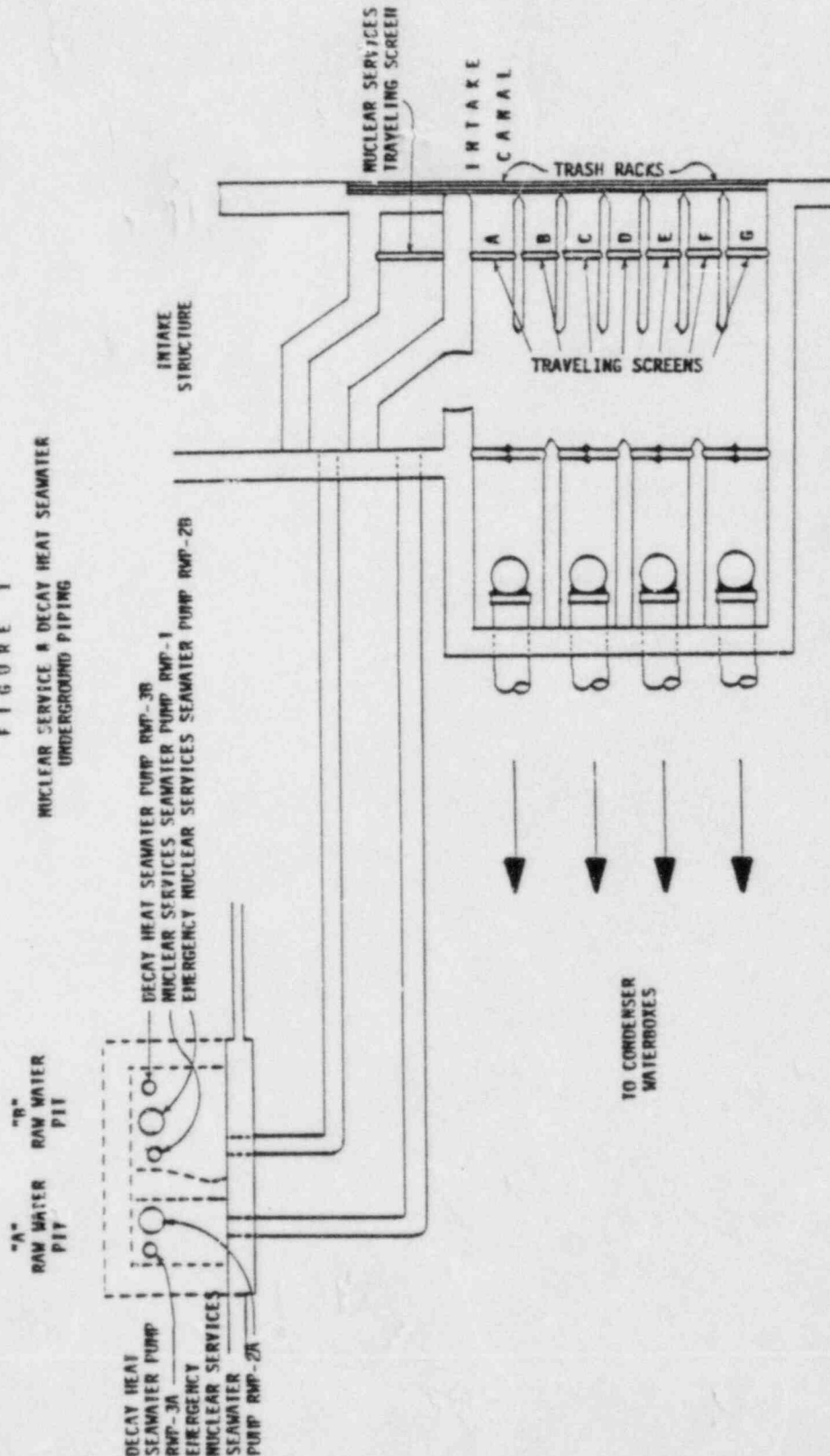
0 1 0 | 2 | 0 1 0 | 0 1 5

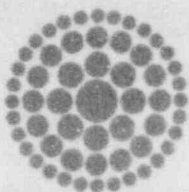
PAGE (3)

OF 0 1 5

TEXT (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17)

FIGURE 1
NUCLEAR SERVICE & DECAY HEAT SEAWATER
UNDERGROUND PIPING





**Florida
Power**
CORPORATION

February 19, 1986
3F0286-10

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. 86-002-00

Dear Sir:

Enclosed is Licensee Event Report (LER) No. 86-002-00 which is submitted in accordance with 10 CFR 50.73. This report has been delayed as described in our letter dated February 10, 1986.

Should there be any questions, please contact this office.

Sincerely,

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
101 Marietta Street N.W., Suite 2900
Atlanta, GA 30323

IE22
11