ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8905190315 DOC.DATE: 89/05/04 NOTARIZED: NO DOCKET #
FACIL:50-261 H.B. Robinson Plant, Unit 2, Carolina Power & Light C 05000261
AUTH.NAME AUTHOR AFFILIATION
CROOK,D. Carolina Power & Light Co.
MORGAN,R.E. Carolina Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 89-008-00:on 890410,potential for loss of RHR capability due to pump flooding.W/890504 ltr.

W/8 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 6
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD2-1 LA	1	1	PD2-1 PD	1	1
	LO,R	1	1			
INTERNAL:	ACRS MICHELSON	1	1	ACRS MOELLER	2	2
	ACRS WYLIE	1	1	AEOD/DOA	1	1
	AEOD/DSP/TPAB	1	1	AEOD/ROAB/DSP	2	2
	DEDRO	1	1	IRM/DCTS/DAB	1	1
	NRR/DEST/ADE 8H	1	1	NRR/DEST/ADS 7E	1	0
	NRR/DEST/CEB 8H	1	1	NRR/DEST/ESB 8D	1	1
	NRR/DEST/ICSB 7	1	1	NRR/DEST/MEB 9H	1	1
	NRR/DEST/MTB 9H	1	1	NRR/DEST/PSB 8D	1	1
	NRR/DEST/RSB 8E	1	1	NRR/DEST/SGB 8D	1	1
	NRR/DLPQ/HFB 10	1	1	NRR/DLPQ/QAB 10	1	1
	NRR/DOEA/EAB 11	1	1	NRR/DREP/RPB 10	2	2
	NUDOCS-ABSTRACT	1	1	REG FILE 02	1	1
	RES/DSIR/EIB	1	1	RES/DSR/PRAB	1	1
	RGN2 FILE 01	1	1			
EXTERNAL:	EG&G WILLIAMS,S	4	4	FORD BLDG HOY,A	1	1
	L ST LOBBY WARD	1	1	LPDR	1	1
	NRC PDR	1	1	NSIC MAYS,G	1	1
	NSIC MURPHY,G.A	1	1			

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE **HELP** US TO **REDUCE WASTE**! CONTACT THE DOCUMENT CONTROL DESK, ROOM P1-37 (EXT. 20079) **TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!**

TOTAL NUMBER OF COPIES REQUIRED: LTTR 43 ENCL 42

A/D-4 ltr

RIDS/ADDS

Enclosure to Serial: RNPD/89-1395

NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2	0 5 0 0 0 2 6 1	1 OF 0 5

TITLE (4)
POTENTIAL FOR LOSS OF RESIDUAL HEAT REMOVAL CAPABILITY DUE TO PUMP FLOODING

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 5 0 0 0
0 4	1 0	8 9	8 9	— 0 0 8	— 0 0	0 5	0 4	8 9		0 5 0 0 0

OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	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)	X 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	TELEPHONE NUMBER
	AREA CODE
David Crook, Senior Specialist - Regulatory Compliance	8 0 3 3 8 3 - 1 1 7 9

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		0 6	3 0	9 0

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

On April 10, 1989, with Unit No. 2 in cold shutdown, it was determined that a condition existed where both Residual Heat Removal pumps could fail due to flooding while in the post LOCA long term recirculation mode of operation. The pumps are located in a pit and are separated by a concrete wall. However, a six inch section of open pipe was discovered to have been installed in the wall during construction, thus allowing possible simultaneous filling of both pump bays should a leak occur during long-term recirculation.

An evaluation of leakage sources was performed, and actions were taken to minimize leakage sources. In addition, the connecting pipe was blocked, a mechanical indication system was made available to allow leakage detection, and the Emergency Operating Procedures (EOPs) were revised to identify and isolate leakage prior to the loss of both RHR pumps. These actions justified continued plant operation in the interim while more permanent corrective action is being pursued. This condition was determined to be reportable pursuant to 10CFR50.73(a)(2)(ii)(B).

IE22
1/1

NRC Form 366A
(9-83)

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
H. B. ROBINSON S. E. PLANT, UNIT NO. 2	0 5 0 0 0 2 6 1	8 9	— 0 0 8	— 0 0	0 2 OF 0 5

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

I. Description of Event

On April 5, 1989, Unit No. 2 was in cold shutdown.[1] During a field validation of the preliminary use Design Basis Document (DBD) for the Safety Injection System (SIS), an internal SSFI Team identified the potential for failure of both Residual Heat Removal (RHR) pumps while in the post LOCA long-term recirculation mode of operation. Both of the RHR pumps are located in a pit and are separated by a concrete wall which is approximately eight feet high at its lowest point. Each separate pump bay is equipped with a non-safety related sump pump. In addition, the pump bay sumps were discovered to be cross connected with a six inch section of pipe located at the bottom of the concrete wall in the sump pump sump. Therefore, following a LOCA, the potential existed for losing both RHR cooling loops due to postulated flooding from a design basis passive failure (e.g. pump seal leakage). The original design basis took credit for Operator action to locate and isolate the leak within thirty minutes. However, sump level instrumentation is non-qualified and the valve operators required to isolate the leak are manual operators inside the RHR pit which is inaccessible during the post recirculation mode due to radiation levels.

The Plant Nuclear Safety Committee convened on April 10, 1989, and concluded that this was a condition outside the design basis of the plant, as defined by the preliminary use DBD, and should be reported in accordance with 10CFR50.73(a)(2)(ii)(B).

II. Cause of Event

The potential for losing both RHR pumps during the post-LOCA recirculation phase was due to communication between both sumps in the RHR pit, allowing flow from one compartment to the other, and the non-safety related sump pumps and level indication systems. An inspection of the six inch pipe connecting the sumps, and the wall it penetrates, indicates that the pipe has been in its current location since plant construction. A review of structural drawings of the RHR pit separation wall indicated that the penetration in the wall was not as originally designed. In addition, a review of the original FSAR did not reveal any references to this flow path. However, the corresponding figures in the Updated FSAR show the existence of the penetration, indicating that the configuration had been recognized and included in the 1982 FSAR update. It is expected that the original purpose of the pipe was to allow flow between the sumps so that the individual sump pumps would operate in a mode redundant to each other. More recent radiation level studies, however, show that Operator action required to locate and isolate the leak may not be possible due to the radiation levels in the room. The cause of the event therefore is the previous lack of a comprehensive design basis document for the SI System and the resulting inability to recognize the non-conforming conditions.

1/ H. B. Robinson Steam Electric Plant, Unit No. 2 is a Westinghouse Pressurized Water Reactor Nuclear Power Plant, in commercial operation since March, 1971.

NRC Form 366A
(9-83)

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
H. B. ROBINSON S. E. PLANT, UNIT NO. 2	0 5 0 0 0 2 6 1	8 9	— 0 0 8	— 0 0	0 3 OF 0 5

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

III. Analysis of Event

This event is reportable pursuant to 10CFR50.73(a)(2)(ii)(B) as a condition outside the design basis of the plant.

The original design basis of the Engineered Safeguards Systems for the plant was to tolerate a single active failure during the injection phase following an accident without loss of protective function. Should the failure occur during the post LOCA long term recirculation phase, the failure definition is expanded such that the systems will tolerate either an active failure or a passive failure (in the fluid systems only) without loss of the system's protective function. The DBD defines a "passive failure" as the structural failure of a static fluid system component which prevents that component from performing its design function. A passive failure is identified as a break in the pressure boundary resulting in abnormal leakage not exceeding 50 gpm. Such leak rates are consistent with limited cracks in pipes, sprung flanges and valve packing leaks or pump seal failures.

It was determined that the combination of the six inch sump cross connect pipe, the limited height of the shield wall between the pumps and the non-safety related sump pumps and level control system, combined with post accident radiation levels in the RHR pit prevented the as installed configuration from meeting the design basis.

IV. Corrective Action

Upon discovery, an evaluation of the potential for losing both RHR cooling loops during post LOCA long term recirculation was initiated. A Justification for Continued Operation of the plant was prepared by assessing the existing sources of water to the RHR pump pit and demonstrating the adequacy of the following short term corrective actions taken.

A mechanical level detection device was made available to each of the RHR pump bays. The water level in each bay will be indicated outside the pit in a low dosage area. The mechanical level system is staged next to the RHR pit and is installed post event but prior to the initiation of recirculation. This will provide a reliable means of determining significant leakage in the RHR pit and give Operations personnel time to take appropriate actions.

The RHR pumps are each provided with HVH units to control the ambient temperature in the pit. Service Water is used as the cooling medium and the potential existed for a service water leak into the pit, thus eventually filling the pit with service water. The RHR pit HVH units had previously been evaluated and determined not to be required for continued RHR pump operation. Emergency Operating Procedures were revised to isolate Service Water to the coolers prior to placing the RHR cooling loops into long-term recirculation. This was necessary because the service water manual isolation valves which require manipulation are located in areas which would potentially have very high radiation exposure levels in the recirculation mode.

NRC Form 366A
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
H. B. ROBINSON S. E. PLANT, UNIT NO. 2	0 5 0 0 0 2 6 1	8 9	— 0 0 8	— 0 0	0 4 OF 0 5

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

The seals on the RHR pumps are cooled by Component Cooling Water (CCW). The potential for CCW pipe failure existed which could result in filling the pit. A Probabilistic Risk Assessment (PRA) was performed which demonstrated an exceptionally low risk to core damage due to CCW leaks (5.5 E-8/yr). Some of the manual valves used to isolate CCW to the RHR pump seals are also located in areas which potentially could have very high radiation exposure levels in the recirculation mode, but, since the risk is so low due to CCW leaks, CCW will be left in service to the RHR pump seals.

A PRA for the common RHR pump suction piping located in the RHR pit demonstrated an exceptionally low risk to core damage due to leakage from this source. Thus compensatory action for this leakage source is unnecessary.

A PRA of the RHR pump seals and the balance of the RHR piping in the RHR pit demonstrated that the RHR pump seals are the major contributor to the risk for the RHR pump pit flooding event (5.1. E-6/yr). Compensatory action for this risk includes the following:

1. Sealing the six-inch RHR pit sump cross connect.
2. Making a mechanical level system available (one for each RHR pump bay).
3. Separating the RHR trains by closing one RHR pump suction valve from the Refueling Water Storage Tank (either 752 A or 752 B).
4. Revising the Emergency Operating Procedures (EOPs) to require a manual valve alignment be performed post event but prior to the initiation of recirculation. This manual valve alignment allows remote isolation of a leaking RHR pump from the Control Room should it occur. The mechanical sump level systems are also installed during this line up.
5. Revising the EOPs to require monitoring of the mechanical level systems once the RHR system is in recirculation and including instructions on how to isolate leakage once it is identified.
6. Walking through the required manual valve alignment and mechanical level systems installation. This verified the required actions can be accomplished within the time available prior to the initiation of recirculation (approximately 30 minutes).

The combination of compensatory actions taken and exceptionally low risk determined through PRA methods described above justify continued operation of H. B. Robinson, Unit 2, while long term corrective actions are assessed.

On April 22, 1989, CP&L presented to NRC Region II Management the plans for follow-up to this event. In that meeting, it was shown that the contribution of risk to core damage due to the as-found configuration (prior to interim corrective action) is sufficiently low such that the additional operator action required by the interim actions may not be necessary. CP&L plans to continue to pursue this issue with the Plant Nuclear Safety Committee and NRR with the objective to remove the burden of the additional operator actions. However, in any event, permanent corrective action to satisfy the design basis regarding identification and isolation of leaks in the RHR pit are currently being reviewed, and are expected to be implemented during the 1990 Refueling Outage. A supplement to this report will be provided to describe these actions.

NRC Form 366A
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
H. B. ROBINSON S. E. PLANT, UNIT NO. 2	0 5 0 0 0 2 6 1	8 9	— 0 0 8	— 0 0	0 5 OF 0 5

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

The DBD Reconstitution Project has been initiated to reconstitute the design basis of all safety related systems. Details of the project has been the subject of presentations in both Region II and NRR Offices.

V. Additional Information

A. Failed Component Identification
This condition was caused by a design deficiency, and is not attributed to an equipment failure.

B. Previous Similar Events
None

C. This condition was self identified.

★U.S.GPO:1986-0-624-538/455

CP&L
Carolina Power & Light Company

ROBINSON NUCLEAR PROJECT DEPARTMENT
POST OFFICE BOX 790
HARTSVILLE, SOUTH CAROLINA 29550

MAY 04 1989

Robinson File No: 13510C

Serial: RNPD/89-1395
(10 CFR 50.73)

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
LICENSEE EVENT REPORT 89-008-00

Gentlemen:

The enclosed Licensee Event Report (LER) is submitted in accordance with 10 CFR 50.73 and NUREG-1022 including Supplements No. 1 and 2.

Very truly yours,

W. J. Flanagan for RCM

R. E. Morgan
General Manager
H. B. Robinson S. E. Plant

RDC:bah

Enclosure

cc: Mr. S. D. Ebneter
Mr. L. W. Garner
INPO

IE22
1/1