

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) SHEARON HARRIS NUCLEAR POWER PLANT - UNIT ONE	DOCKET NUMBER (2) 0 5 0 0 0 4 0 0	PAGE (3) 1 OF 06
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TITLE (4) **EMERGENCY OPERATING PROCEDURE DEFICIENCY FOR SWITCHOVER TO RECIRCULATION AFTER A LOSS OF COOLANT ACCIDENT**

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	15	8	8	0	0	3	2			0 5 0 0 0
											0 5 0 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

OPERATING MODE (9) 1	20.402(b)	20.405(e)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 1 1 0 1 0	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 ANDREW HOWE - SR. ENGINEER REGULATORY COMPLIANCE	TELEPHONE NUMBER
	AREA CODE: 9 1 9 NUMBER: 3 6 2 1 - 2 7 1 9

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

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

On January 15, 1988, it was discovered that a procedure deficiency had previously existed in the Emergency Operating Procedures (EOPs) which could have resulted in the failure of the Emergency Core Cooling System (ECCS) during the recirculation phase of an accident, under a scenario of a single failure of one Residual Heat Removal Pump (RHRP). The deficiency involved an improper valve lineup which could cause a RHRP to exceed its design flow limit during ECCS recirculation, if one of the two RHRPs had failed during a loss of coolant accident (LOCA) leaving only one operating RHRP, and if the LOCA was sufficiently large to completely depressurize the Reactor Coolant System.

This procedure deficiency resulted from the failure to completely incorporate into plant procedures a change made to the Final Safety Analysis Report.

The deficiency existed beginning in December of 1986, when the EOP containing the error was approved, and initial operation of the plant began. When the safety significance of the discrepancy was discovered, the EOPs were revised to correct the error. This occurred on December 16, 1987.

Other FSAR changes made in this time period involving a change to procedures were reviewed to ensure they were properly implemented. Members of the Plant Nuclear Safety Committee have been advised of this situation and reminded of their responsibility regarding the reportability of such situations.

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TEXT (If more space is required, use additional NRC Form 308A's) (17)

DESCRIPTION:

Note: The following drawings supplement the narrative of this report:

Attachment A - ECCS Recirculation Flowpath Existing Prior to September 1986

Attachment B - ECCS Recirculation Flowpath Required in FSAR After September 1986

Attachment C - ECCS Recirculation Flowpath Implemented in Procedures, December 1986

The switchover procedure for transferring the Emergency Core Cooling System (ECCS) from injection to recirculation is outlined in FSAR Table 6.3.2-6. The initial practice required closing isolation valves to separate the ECCS headers into two separate trains, thus providing protection for passive failures of the piping. The resulting valve lineup for recirculation is shown in Attachment A. On September 27, 1985, and on August 21, 1986, Westinghouse Electric Corporation, the Nuclear Steam Supply System designer for the Shearon Harris Nuclear Power Plant (SHNPP), issued letters (serial CQL-9018 and CQL-9445) to Ebasco Services, Inc., the architect/engineer for SHNPP. The letters documented recommendations for changes to the procedure described in FSAR Table 6.3.2-6 for the switchover. Westinghouse recommended deletion of the procedure steps which separated the two ECCS trains, since these steps did not provide complete passive failure protection, and since their elimination would allow a single RHRP to supply both CSIPs. In addition, the second correspondence identified the need for new check valves to be installed in the piping connecting the discharge of an RHRP to the CSIP suction, to prevent potential backflow through an idle RHRP during recirculation.

These proposed changes were approved for implementation at SHNPP, since they improved operational flexibility following an accident. In addition, a separate issue regarding requirements for local leak rate testing (LLRT) on ECCS containment penetrations was also resolved by implementing this proposed change.

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DESCRIPTION: (continued)

An FSAR change (serial HPOS-845) was initiated to incorporate these changes. As part of the review of these changes, Technical Support determined that a single RHRP could not supply two CSIPs and both low pressure ECCS injection headers, as the proposed recirculation lineup required. However, by isolating one of the two low pressure safety injection (LPSI) header containment isolation valves, an acceptable configuration was created. This revised lineup demonstrated that the RHRP would not run out (Preoperational Test 2085-P-05, completed October 5, 1986). Therefore, the FSAR change included the new requirement to close one of the two LPSI containment isolation valves to ensure that runoff of the RHRP would not occur during recirculation if the other RHRP failed.

This change was incorporated into the FSAR change which was approved on September 24, 1986. A letter was also submitted to the NRC describing this change.

The change required significant revisions be made to the EOPs; however, due to other commitments, revisions were already in progress. The additional changes required due to the FSAR change were not therefore formally identified and tracked. On December 22, 1986, Revision 2 to procedure EOP-EPP-010, Transfer to Cold Leg Recirculation, was issued. However, the revision did not fully implement the requirements of the FSAR in that the requirement to close one LPSI containment isolation valve, identified in FSAR change HPOS-845, was not included. The procedure change package references this FSAR change in its safety analysis, but the engineers developing the procedure revision were not fully cognizant of all the new requirements.

The SHNPP On-site Nuclear Safety (ONS) unit was responsible for the review of INPO Significant Event Reports (SER), and during review of SER 2-87, they identified the discrepancy between the FSAR and the EOPs. On July 10, 1987, an action item was established for the plant engineering department to evaluate the discrepancy to determine whether the procedure or the FSAR was inaccurate. On December 3, 1987, the engineering department confirmed the deficiency was in the EOPs.

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DESCRIPTION: (continued)

Separately, Operations personnel noted that the Monitor Light Box (MLB) for ECCS recirculation was engraved to require one LPSI containment isolation valve to be close while the other was open. Believing this to be a simple engraving error, a Plant Change Request (PCR) (serial PCR-2384) was initiated on September 25, 1987, to change the engraving to require the valve to be open during recirculation, in agreement with the plant EOPs. The PCR was rejected by Technical Support personnel, since they were aware of the previous FSAR change requiring the valve to be closed to prevent RHR pump runout. The Operations engineer who initiated the PCR then wrote a feedback report (serial 305) in accordance with plant procedure OMM-001, Operations - Conduct of Operations, on October 26, 1987. A procedure change was determined to be required, and was to be addressed in the next revision which was to be issued in the fall of 1988.

In both cases, personnel were not cognizant of the safety significance of the procedure deficiency.

However, when ONS received the response for INPO SER 2-87 from engineering on December 3, 1987, the ONS unit contacted Operations and made them aware of the serious nature of the deficiency. A change to procedure EOP-EPP-010 was issued on December 16, 1987, correcting the error and making the procedure consistent with the FSAR. In addition, procedure EOP-EPP-003, Loss of All AC Power Recovery with Safety Injection Required, which also addresses the recirculation lineup, was issued on January 6, 1988.

On January 15, 1988, this matter was discovered by Regulatory Compliance personnel. The situation existing for nearly one year in which the emergency operating procedures were in disagreement with the FSAR was investigated and determined to be reportable.

SAFETY SIGNIFICANCE:

The ECCS, and hence all procedures governing operation of this system, were required to be in place when the plant first entered Mode 4 in December of 1986, as per Technical Specification 3.5.3. In the event of a large break loss of coolant accident simultaneous with the single failure of an RHRP, when the recirculation phase of ECCS operation was initiated in accordance with plant procedures, the plant would have been in an unanalyzed condition.

This conclusion was reached after a review of the significance of this event. Technical Support and Engineering personnel reviewed the test data and evaluation that was done in 1986 which determined that one LPSI header must be isolated during recirculation. The result of this review confirmed that the earlier test did not demonstrate sufficient margin to allow flow to both LPSI headers during recirculation.

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SAFETY SIGNIFICANCE: (continued)

The single operating RHRP could have exceeded its design flow limit under such a scenario, which would cause the RHRP to trip on overcurrent, subsequently causing the failure of the CSIPs, since these pumps rely on the RHRP as the source of water for recirculation operation. Operator action outside of plant procedures would have been required to recover the situation.

The following indications would have been available to the operator to alert him of the problem:

- Flow indication and alarms for the RHRP
- Motor amperage indication for the RHRP
- Alarms for the MLB due to the valve lineup error
- Alarm for the RHRP tripping
- Alarms for the CSIPs tripping

It has been determined that restoration of a single RHRP without any operating CSIPs would be sufficient to ensure adequate post-LOCA cooling of the core, provided the flow is restored within approximately 3-4 minutes after interruption. The operator would have to reset the over current trip at the RHRP breaker, located one floor level below the control room, and restart the pump using the control switch.

The condition is reportable in accordance with 10CFR50.73(a)(2)(v) as a procedural error which could have prevented the fulfillment of the safety function of systems which mitigate the consequences of an accident.

CAUSE:

There is no single reason that this procedure deficiency came into existence, but the following contributed to the error.

1. Personnel responsible for the EOPs were aware of the Westinghouse proposals to revise the ECCS recirculation lineup, and when the FSAR was changed to implement this new lineup the additional requirement to close the LPSI isolation valve was not noted. The modification to close one of the two LPSI containment isolation valves affected only one page of a change package which was 32 pages in length, and the majority of this package discussed containment isolation valve design, not ECCS recirculation procedures.

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TEXT (If more space is required, use additional NRC Form 368A's) (17)

CAUSE: (continued)

2. Changes made to the FSAR, which would require changes to plant procedures, were not routinely identified and tracked prior to licensing of the plant due to the significant number of changes and due to the fact that procedures were being revised prior to initial use in preparation for the operation of the plant.
3. FSAR changes are not immediately made available in the copies of the FSAR, since updates are only required annually by regulations.

The discrepancy between the FSAR and EOPs was identified by many groups during 1987. However, the technical issue as to which document was accurate was not obvious. Investigation of the discrepancy was not given appropriate urgency, given the potential consequences of the discrepancy. When the investigation was completed, the problem was corrected within a reasonable period of time, but the potential reportability of the situation was not identified.

No similar situations have previously occurred.

CORRECTIVE ACTIONS:

The EOPs were revised prior to the discovery of this situation.

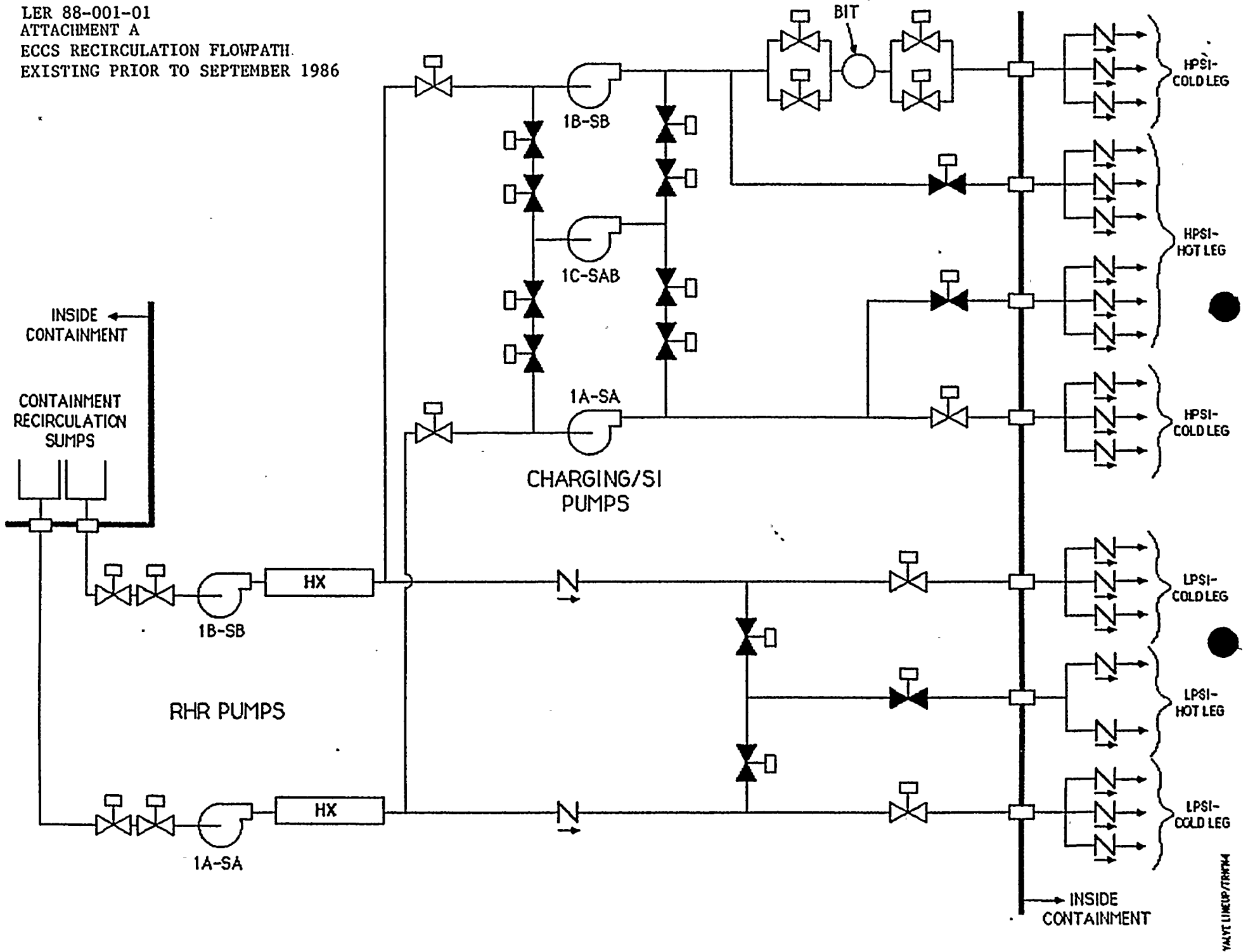
The events which led to this procedure deficiency occurred prior to licensing of the plant. Upon issuance of the operating license, many changes went into effect regarding how plant design changes are controlled:

- Changes to the plant components which require a PCR receive a complete safety analysis in accordance with 10CFR50.59.
- PCRs are reviewed by the appropriate units to determine the impact on plant procedures for which they are responsible.
- FSAR changes now follow, rather than precede, the changes made to the plant and/or procedures.

The following additional measures have been taken:

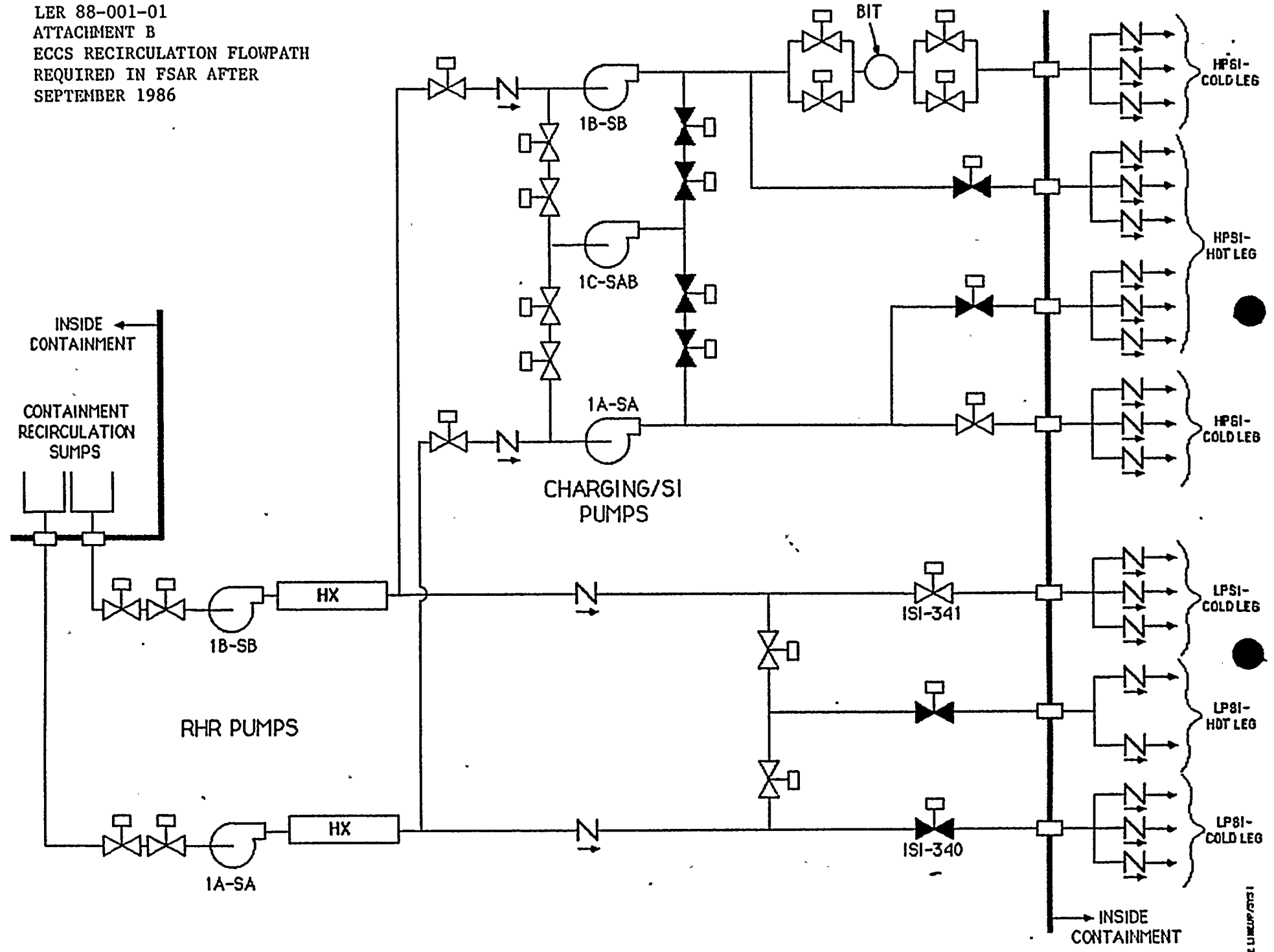
- Changes to the FSAR approved in 1986 have been reviewed to verify that those changes which alter procedures described in the FSAR were properly implemented in the plant. No similar situations were discovered.
- Members of the Plant Nuclear Safety Committee have been informed of this event and reminded of their responsibility to ensure potentially reportable items are brought to the attention of management.

LER 88-001-01
 ATTACHMENT A
 ECCS RECIRCULATION FLOWPATH.
 EXISTING PRIOR TO SEPTEMBER 1986



YALVT LINEUP/TRM74

LER 88-001-01
 ATTACHMENT B
 ECCS RECIRCULATION FLOWPATH
 REQUIRED IN FSAR AFTER
 SEPTEMBER 1986



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Carolina Power & Light Company

HARRIS NUCLEAR PROJECT
P.O. Box 165
New Hill, NC 27562

MAR 29 1988

File Number: SHF/10-13510C
Letter Number: HO-880080 (0)

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

SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1
DOCKET NO. 50-400
LICENSE NO. NPF-63
LICENSEE EVENT REPORT 88-001-01

Gentlemen:

In accordance with Title 10 to the Code of Federal Regulations, the enclosed Licensee Event Report is submitted. The original report fulfills the requirement for a written report within thirty (30) days of a reportable occurrence and is in accordance with the format set forth in NUREG-1022, September, 1983.

Revision one provides additional information regarding the potential safety significance of the reported condition, based on further engineering evaluation.

Very truly yours,

R. A. Watson
Vice President
Harris Nuclear Project

MGW:ddl

Enclosure

cc: Dr. J. Nelson Grace (NRC - RII)
Mr. B. Buckley (NRR)
Mr. G. Maxwell (NRC - SHNPP)

MEM/LER-88-001/1/OS1

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