Peter E. Katz
Plant General Manager

1650 Calvert Cliffs Parkway
Lusby, Maryland 20657
410 495-4101

Constellation
Nuclear

Calvert Cliffs
Nuclear Power Plant

A Member of the
Constellation Energy Group

April 18, 2002

U.S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318;
License Nos. DPR 53 & DPR 69
Licensee Event Report 2002-02
Potential High Pressure Safety Injection Pump Run-out Failure

The attached report is being sent to you as required under 10 CFR 50.73 guidelines. Should you have questions regarding this report, we will be pleased to discuss them with you.

Very truly yours,

Peter E. Katz

PEK/TER/bjd

Attachment

cc: R. S. Fleishman, Esquire
J. E. Silberg, Esquire
Director, Project Directorate I-1, NRC
D. M. Skay, NRC
H. J. Miller, NRC
Resident Inspector, NRC
R. I. McLean, DNR

IE22

NRC FORM 366 (7-2001) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Calvert Cliffs Nuclear Power Plant, Unit 1	05000 317	1 OF 005

4. TITLE
Potential High Pressure Safety Injection Pump Run-out Failure

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
02	21	02	2002	- 02	00	04	18	2002	CCNPP, Unit 2	05000 318
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE	1
10. POWER LEVEL	100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR : (Check all that apply)

20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)
20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)
20.2203(a)(1)	50.36(c)(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)
20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)
20.2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER Specify in Abstract below or in NRC Form 366A
20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	
20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	X 50.73(a)(2)(v)(D)	
20.2203(a)(2)(v)	50.73(a)(2)(i)(B)	50.73(a)(2)(vii)	
20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)	
20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)	

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
T. E. Roxey, Senior Engineer	410-495-2065

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED			15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO				

16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On February 21, 2002, a potential high pressure safety injection (HPSI) pump run-out failure mode was determined to exist if a large break loss-of-coolant-accident (LOCA) occurred during reverse flow testing of HPSI pump discharge check valves. The test resulted in a plant configuration where the non-tested HPSI pump was aligned to both HPSI headers. If a large break LOCA had occurred during the test, the remaining operable HPSI pump would have supplied coolant to both headers. High pressure safety injection pump flow-rate would have increased and probably caused the pump to fail due to run-out.

High pressure safety injection pumps have been verified to operate satisfactorily at flow-rates up to 771 gpm. However, the increased flow-rate when injecting into two headers pushes the predicted flow above this value. It is not known at what flow-rate run-out failure of a HPSI pump would occur. This potential HPSI failure is caused by a procedural deficiency that has been present since startup.

The test procedure has been changed to ensure that the operable HPSI pump is only aligned to it's own header during this test.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
CALVERT CLIFFS, UNIT 1	05000 317	2002	- 002	- 00	02 OF 005

17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

I. DESCRIPTION OF EVENT

At 08:00 am on February 21, 2002 it was determined that the potential had existed for a high pressure safety injection (HPSI) pump to experience a run-out failure, if a large break loss-of-coolant accident (LOCA) occurred while the redundant HPSI pump was out-of-service for testing of its reverse flow check valve. The time the plant was exposed to this potential HPSI failure mode was approximately five hours per year (once per quarter and once annually). At the time this issue was discovered, Unit 1 was at 0 percent power and in a refueling outage and Unit 2 was operating at 100 percent rated thermal power.

During a review of changes made to Surveillance Test Procedures, STP O-65-1 and 2, HPSI and LPSI Pump Check Valve Closure Test, a question was raised regarding the required HPSI system alignment to perform back flow testing of the discharge check valve for 23 HPSI. When 23 HPSI pump discharge check valve, 2-SI-405, Reverse Flow Test, is performed the following test alignment is required (Figure 1):

1. Technical Specification 3.5.2 Action A, for one HPSI train inoperable is entered.
2. 22 and 23 HPSI pump handswitch are placed in pull-to-lock.
3. 23 HPSI pump suction stop, 2-SI-402 is shut.
4. 2-SI-653-MOV HPSI header cross-connect valve is opened.
5. 21 HPSI pump is started.

If a large break LOCA were to occur during this testing alignment, either with or without a design basis loss-of-offsite power, all eight HPSI loop isolation motor-operated valves (MOVs) would open as designed. The 22 and 23 HPSI pumps would remain secured (handswitches in pull-to-lock) and the remaining 21 HPSI pump would feed all eight HPSI loop isolation MOVs.

If a HPSI pump is powered by a diesel generator operating at the high end of its allowed frequencies, 61.2 Hz, then the predicted HPSI flow-rate would be at its maximum. The HPSI flow-rate would increase from approximately 769 gpm, when injecting through four HPSI loop isolation MOVs, to approximately 825 gpm when injecting through all eight.

High pressure safety injection pumps have been tested at flow-rates up to 771 gpm. However, the increased flow-rate when injecting via eight HPSI loop isolation MOVs, results in a predicted flow-rate above this value. It is not known at what flow-rate run-out failure of the HPSI pump would occur.

II. CAUSE OF EVENT

The cause for this potential HPSI failure was a procedural deficiency that has been present since initial plant startup in the 1970's. Surveillance Test Procedures O-65-1 and 2, appear to have utilized this testing alignment on both Units since the 1970's.

III. ANALYSIS OF EVENT

The HPSI system is part of the overall safety injection system for the plant. The safety injection system is designed to supply emergency core cooling in the unlikely event of a LOCA.

The HPSI system is capable of delivering emergency coolant to the Reactor Coolant System (RCS) at a discharge pressure up to 1275 psia. Three pumps are provided and supply two independent headers. Each header, in turn, supplies four individual motor-operated HPSI loop isolation MOVs, one leading to each cold leg of the RCS. Each set of four HPSI loop isolation MOVs is automatically opened from a different emergency power bus upon initiation of safety injection actuation signal. One HPSI pump [11(21), 13(23)] is normally lined-up to each header and is available for automatic initiation. The third HPSI pump [12(22)] capable of being aligned to either header and is normally in pull-to-lock and not available for automatic initiation.

If a large break LOCA had occurred during the test, RCS pressure would immediately drop and HPSI would be initiated. As described previously, the remaining operable HPSI pump would have started to deliver flow to two HPSI headers. However, we believe the back-pressure of the combined eight open HPSI loop isolation MOVs to the single operating HPSI pump would not have been great enough to prevent HPSI pump run-out and subsequent failure. This scenario could have resulted in no HPSI pumps automatically supplying cooling water to the core.

The potential safety significance of the above scenario is considered to be very small due to the following:

1. The likelihood of a large break LOCA occurring at either plant is extremely small.
2. The time the plant was exposed to the condition was very small. It is estimated that the plant was exposed to the condition for approximately 4-5 hours per year per HPSI pump (8-10 hours per year for each unit).

An evaluation of this issue has been performed to quantify its potential safety significance. The evaluation assumed this surveillance test has been run once per quarter for each HPSI and once per year annually to account for any preventative maintenance tests that required performance of the test. In addition, each test takes approximately one hour to complete. The resulting increase in core damage frequency was about 8E-07 for both units.

Based on the above, it is concluded that this issue did not present a significant decrease in protection to the health and safety of the public or plant personnel.

This event is considered reportable in accordance with 10 CFR 50.73 (a)(2)(v)(D); Any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

IV. CORRECTIVE ACTIONS

Both STP's 0-65-1 and 2 have been revised to include a step to shut the HPSI header isolation valve, for the HPSI pump being tested, while a HPSI pump discharge check valve is being reverse flow tested. (1-SI-654 for testing 13 HPSI pump; 1-SI-656 for testing 11 HPSI pump; 2-SI-654 for testing 23 HPSI pump; 2-SI-656 for testing 21 HPSI pump.) These procedural changes will prevent a HPSI pump from being aligned to two HPSI headers during future performance of STP O-65-1 and 2.

V. ADDITIONAL INFORMATION

A. Affected Component Identification:

Component or System	IEEE 803 EIIS Funct	IEEE 805 System ID
Reactor	RCT	
Reactor Core System		AC
HPSI Pump		AC
HPSI Discharge Check Valve		AC
HPSI Cross-Connect Valve		AC

B. Previous similar events:

A review of Calvert Cliffs' Licensee Event Reports over the past several years has been performed. The review did not identify any similar reportable events.

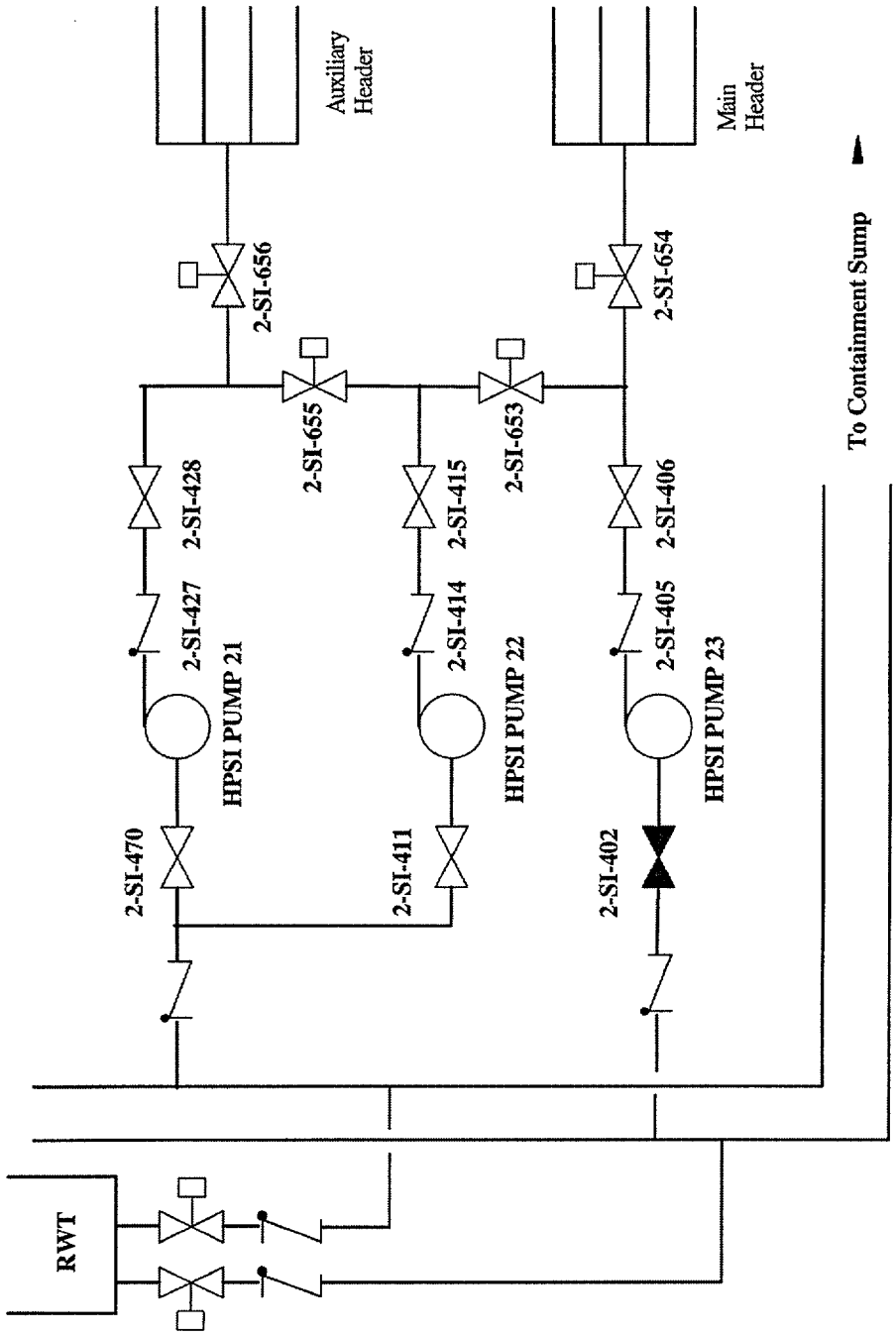

Figure 1
HPSI Pump Alignment for Test