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)
Surry Unit 1	0 5 0 0 0 2 8 0	1 OF 0 4

TITLE (4): Reactor Trip: Low Steam Generator Level with Steam Flow / Feed Flow Mismatch

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 2	0 6	8 4	8 4	0 0 3	0 0	0 3	0 6	8 4		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9): N

POWER LEVEL (10): 1 0 0

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)
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	TELEPHONE NUMBER (AREA CODE)
J. L. Wilson (Station Manager)	8 0 4 3 5 7 - 3 1 8 4

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	I G	R I	W 1 2 0	Y					
X	S J	F C V	C 6 3 5	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES *(If yes, complete EXPECTED SUBMISSION DATE)* ✓ NO

EXPECTED SUBMISSION DATE (15): MONTH DAY YEAR

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

On February 6, with the unit at 100% power, a reactor trip occured as a result of a low steam generator level with a steam flow/feed flow mismatch in "A" steam generator. This condition was the consequences of closing a tripped feeder breaker in the condensate polishing building that caused the inlet valves to the demineralizer beds to close. The closed inlet valves decreased the condensate supply to the main feed pumps which resulted in a decrease in main feed water flow and steam generator level.

Following the trip, normal valve lineup was established in the condensate polishing building and the tripped breaker was replaced with a spare.

1. Event Description

On February 6, at 1847 hours, with the unit at 100% power, a reactor trip occured as a result of a low steam generator level with a steam flow/feed flow mismatch in "A" steam generator.

Prior to the reactor trip, a 40 ampere feeder breaker (EIIS No. Bkr.) which feeds condensate polishing building control panel (1-CP-PNL-1), tripped. De-energizing the control panel caused the following:

1) The normally open "Pressurizing Valves" to the individual condensate polishing demineralizers beds (EIIS No. FDM) closed and signaled the demineralizers 10 inch "Inlet Valves" (EIIS No. PDCV) to close. However, the demineralizer Inlet Valves did not close because of the loss of control power. (See Figure 1)

2) The polishing building bypass AOV fully opened.

On loss of power to the control panel, the polishing building operator fully opened the polishing building bypass AOV from its manual/auto station (the AOV had already opened due to loss of power). Five minutes following the feeder breaker trip, operators located and closed the breaker.

Re-energizing the control panel (1-CP-PNL-1) caused the Inlet Valves to the individual demineralizer beds to close. These valves are electrically interlocked with the demineralizer bed pressurizing valves.

The closure of the inlet valve to the demineralizer beds caused low suction pressure to the main feed pumps (EIIS No. P) which resulted in the automatic opening of the condensate polishing building bypass MOV (Motor Operated Valve). The decrease in condensate supply to the main feed pumps resulted in a decreased main feedwater flow and steam generator level. As a result, the reactor tripped on feed flow/steam flow mismatch with low level in "A" steam generator.

Immediately following the reactor trip, operators noted all control and protection systems to function properly except for the isolation of the "A" main feedwater line and the automatic reinstatement of the Source Range channel (EIIS No. RI). The "A" feed regulation valve FCV-FW-1478 (EIIS No. FCV) would not fully close upon demand. Under compensation of the intermediate range NI-36 (EIIS No. JI) prevented the Source Range from automatically reinstating. In addition, the manual reset circuit for the source range malfunctioned.

Operators followed appropriate plant procedures and quickly stabilized plant following the trip.

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

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

2. Safety Consequences and Implications

Automatic closure of the feed reg. valves following a reactor trip in coindidence with low Tave or a safety injection, minimizes excessive primary plant cooldown in the event of a steam line break. Source range channels when reinstated, prevent any uncontrolled power increases during a reactor startup.

The main feed pumps would have tripped in the event of a Safety Injection Signal which would have provided the required feedwater isolation and the source range channel was manually reinstated prior to resetting the reactor trip breakers.

In addition, all other safety related systems remained operable during the event and plant parameters remained within the bounds of the accident analysis. Therefore, this event did not constitute an unreviewed safety question nor affect the health and safety of the public.

3. Cause

The cause for the reactor trip was due to a low level and steam flow/ feed flow mismatch in "A" steam generator. This condition was induced by the closure of the Inlet Valves to demineralizers beds in the condensate polisher building without adequate polisher bypass flow. Closing of the Inlet Valves was a result of re-energizing the tripped feeder breaker to panel 1-CP-PNL-1. The cause of breaker trip could not be repeated or determined. The cause of the "A" feed reg. valve malfunction could not be determined. (This is a repeat of a Unit 1 event on 1-18-84) (LER 84-002-00). Under compensation of Intermediate Range Channel NI-36 prevented the source range channel from automatically reinstating. Initial failure to manually reinstate the source range is believed to have been due to capacitor problems in the circuitry.

4. Immediate Corrective Action

Operators performed all appropriate emergency procedures and function restoration procedures to ensure the plant was returned to a stable condition. This included isolating the feedwater to the "A" steam generator by closing isolation valve MOV-FW-154A, and manually reinstating the source range channel.

Also, the STA performed the status tree reviews to ensure Specific Plant parameters were noted and the appropriate procedures were used to maintain these parameters within safe bounds.

5. Additional Corrective Action

The tripped feeder breaker was replaced with a spare. The "A" main feed regulation valve was tested satisfactorily prior to the unit start up. The intermediate range channel NI-36 was monitored.

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

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

6. Action Taken to Prevent Recurrence

Action taken to prevent unintentionally increasing condensate polishing building differential pressure include the following:

1) A label will be installed on the feeder breakers to provide a caution that the polisher must be bypassed prior to reclosing the breaker.

2) An Engineering Study will be performed to review the control logic of the polishing building bypass.

The FRV Operator and valve will be dissassembled and inspected with assistance of a valve manufacturing representative.

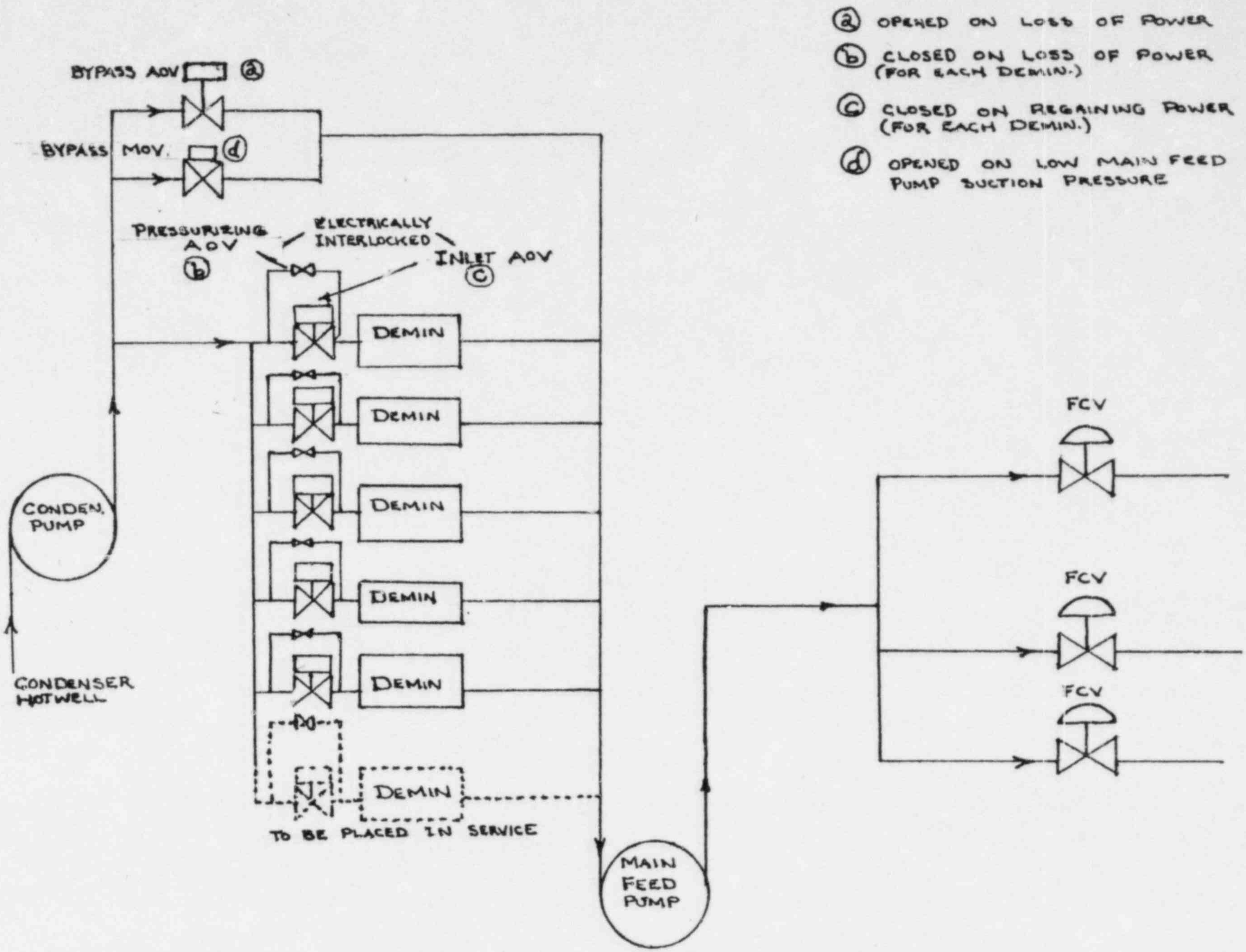
Maintenance and calibration procedures for the intermediate range will be reviewed.

In June, 1977, a .1 μF capacitor was added to the source range circuit to correct a problem with reinstating the source range detectors similar to what was experienced during this event. It is suspected that the condition of this capacitor has deteriorated and it's replacement will again correct the problem.

7. Generic Implications

The above actions pertaining to the tripped breaker apply to unit 2 also.

FIGURE I



BYPASS AOV ⓐ
BYPASS MOV. ⓓ
PRESSURIZING AOV ⓑ
ELECTRICALLY INTERLOCKED
INLET AOV ⓒ
DEMIN
DEMIN
DEMIN
DEMIN
DEMIN
DEMIN
TO BE PLACED IN SERVICE
CONDEN. PUMP
CONDENSER HOTWELL
MAIN FEED PUMP
FCV
FCV
FCV
ⓐ OPENED ON LOSS OF POWER
ⓑ CLOSED ON LOSS OF POWER (FOR EACH DEMIN.)
ⓒ CLOSED ON REGAINING POWER (FOR EACH DEMIN.)
ⓓ OPENED ON LOW MAIN FEED PUMP SUCTION PRESSURE

Vepco

84 MAR 8 P 1:03

VIRGINIA ELECTRIC AND POWER COMPANY
Surry Power Station
P. O. Box 315
Surry, Virginia 23883

MAR 6 1984

Serial No: 84-008

Docket No: 50-280

License No: DPR-32

Mr. James P. O'Reilly
Regional Administrator
Suite 2900
101 Marietta Street, NW
Atlanta, Georgia 30303

Dear Mr. O'Reilly

Pursuant to Surry Power Station Technical Specifications, the Virginia Electric and Power Company hereby submits the following Licensee Event Report for Surry Unit 1.

Report Number
84-003-00

This report has been reviewed by the Station Nuclear Safety and Operating Committee and will be reviewed by Safety Evaluation and Control.

Very truly yours,

J. L. Wilson
J. L. Wilson
Station Manager

Enclosure

cc: Document Control Desk, USNRC
016 Phillips Bldg.
Washington, D. C. 20555

OFFICIAL COPY

IE22
1/1