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)
Surry Power Station, Unit 1	0 5 0 0 0 2 8 0	1 OF 0 5

TITLE (4) Potential For An Inadequate Service Water Supply During A LOCA With A Loss of Offsite Power.

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 9	1 2	8 8	8 8	0 3 1	0 0	1 0	1 2	8 8		0 5 0 0 0
										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)			
N		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)
1 0 0		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
D. L. Benson, Station Manager	AREA CODE 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	

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

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

On September 12, 1988 at 0945 hours, with Unit 1 at 100% power and Unit 2 at cold shutdown (CSD), it was determined that an adequate supply of service water may not be available to provide sufficient flow to the Recirculation Spray Heat Exchangers (RSHX), in the event that a large break Loss Of Coolant Accident (LOCA), on one unit, and a Loss of Offsite Power (LOOP) occurred, in coincidence with the additional failure of either an emergency service water pump, condenser isolation signal, an emergency diesel generator, a service water isolation valve, or the intake vacuum priming breakers. The potentially inadequate SW supply following a LOCA with a LOOP is the result of a design deficiency and an inconsistency between T. S. and the Final Safety Analysis Report (FSAR). Prior to startup of either unit, actions will be taken to address each scenario. These will include, changes to plant Emergency Procedures, a requirement that three emergency service water pumps be operable during certain plant conditions, and a design change to provide a safety related circulating water (CW) isolation signal to ensure satisfactory CW isolation.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

1.0 Description of the Event

On September 12, 1988 at 0945 hours, with Unit 1 at 100% power and Unit 2 at cold shutdown (CSD), it was determined that an adequate supply of service water may not be available to provide sufficient flow to the Recirculation Spray Heat Exchangers (RSHX) {EIIS-BE, HX}, in the event that a large break Loss Of Coolant Accident (LOCA), on one unit, and a Loss of Offsite Power (LOOP) occurred, in coincidence with the additional failures described in the scenarios below.

1) At present, Technical Specifications (T. S.) require two Emergency Service Water (ESW) {EIIS-BI} pumps to be operable when a unit is above 350 degrees Fahrenheit/450 psig. This scenario postulates that during a LOCA and LOOP, a failure of one of the two operable ESW pumps could result in a canal inventory loss of 21,000 gpm, since the RSHXs would use 36,000 gpm and one ESW pump is designed to supply 15,000 gpm.

2) Non safety grade equipment is used to detect either a low canal level or a loss of two reserve station service transformers coincident with a hi hi CLS. The low canal level signal will automatically isolate circulating water to the condenser, component cooling, bearing cooling and other non essential service water subsystems. The other signal will automatically isolate circulating water to the condenser. This scenario assumes that the equipment used to detect the conditions stated above could fail, and consequently, the required isolation of service water would not occur.

3) A LOCA with a LOOP and one unit's Residual Heat Removal system (RHR) {EIIS-BP} in operation, and the failure of one of the two required ESW pumps, would also result in an inadequate service water supply.

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Subsequent reviews, with both units at cold shutdown, identified the following related scenarios.

4) A LOCA and LOOP with a failure of the non accident unit's Emergency Diesel Generator {EIIS-DG} (EDG) would result in an excessive drawdown of the intake canal due to the loss of power to the non accident unit's condenser isolation valves. In addition, a LOCA with either a LOOP or low canal level and a single failure of one of the BC or CC valves, could result in a drawdown of the canal level.

5) The potential exists for the Circulating Water (CW) pumps discharge lines to siphon water out of the canal, if the non safety grade vacuum breakers on the discharge lines fail. However, this is only a concern if canal level is required to be greater than 18 feet, since the discharge lines are designed to allow sufficient air intake to break the siphon when canal level drops to 18 feet.

2.0 Safety Consequences and Implications

The scenarios described above would require as a minimum, the occurrence of three highly unlikely events to result in an inadequate supply of service water. The events are a LOCA, a LOOP, and a failure of one of the following: An emergency service water pump, condenser isolation signal, an EDG, a service water isolation valve, or the intake vacuum priming breakers. Both units are currently in cold shutdown and will remain shutdown until corrective actions are implemented. Therefore, the health and safety of the public will not be affected.

3.0 Cause

The potentially inadequate SW supply following a LOCA with a LOOP is the result of a design deficiency and an inconsistency between T. S. and the Final Safety Analysis Report (FSAR). The original design for condenser isolation did not account for a potential failure of the non-LOCA units' emergency diesel generator. The present T. S. requirements for two

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operable ESW pumps does not account for the SW requirements for a LOCA on one unit with the other unit on RHR. Also, the original design did not require that all of the components required to achieve condenser isolation be qualified as safety grade.

4.0 Immediate Corrective Action(s)

Operator standing orders were issued that instructed the operators to maintain greater than 27 feet of water in the canal and provided guidance on how to minimize depletion of service water from the canal and maximize the supply in the event the above scenarios occurred.

In addition, instructions were issued to maintain three emergency service water pumps operable while either unit is on the residual heat removal system and the other unit is above 350 degrees Fahrenheit/450 psig.

5.0 Additional Corrective Action(s)

Prior to startup of either unit, actions will be taken to address each scenario described above. These actions will include the following:

1) Changes to plant Emergency Procedures.

2) Operations requirement that three emergency service water pumps be operable prior to placing a unit on RHR with the other unit above 350 degrees Fahrenheit/450 psig and submission of a T. S. change request to that effect.

3) Design changes will be implemented that will provide a safety related CW isolation signal and make the necessary modifications to ensure satisfactory CW isolation.

6.0 Action(s) Taken to Prevent Recurrence

The current design change program requires that the change be analyzed for effect on any of the accident analyses. In addition, a thorough review of the UFSAR will be performed as part of a planned design basis development program.

*U.S. GPO: 1988-520-589/00070

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7.0 Similar Events

None.

8.0 Manufacturer/Model Number

N/A

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

October 12, 1988

U.S. Nuclear Regulatory Commission
Document Control Desk
016 Phillips Building
Washington, D.C. 20555

Serial No.: 88-053
Docket No.: 50-280
Licensee No.: DPR-32

Gentlemen:

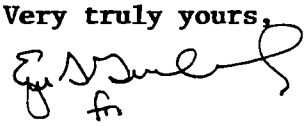
Pursuant to Surry Power Station Technical Specifications, Virginia Electric and Power Company hereby submits the following Licensee Event Report for Surry Unit 1.

REPORT NUMBER

88-031-00

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,



David L. Benson
Station Manager

Enclosure

cc: Dr. J. Nelson Grace
Regional Administrator
Suite 2900
101 Marietta Street, NW
Atlanta, Georgia 30323

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