Update Report-Previous Report Dated 5/15/85

POW 28-06-01

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 Power Station, Unit 1	0 5 0 0 0 2 8 0	1 OF 0 4

TITLE (4)
Intermediate Range Setpoint Non-Conservatism

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	1 5	8 5	8 5	0 1 0	0 1	0 7	3 0	8 5	SPS Unit 2	0 5 0 0 0 2 8 1
										0 5 0 0 0

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 3 0	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)	X 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
R. F. Saunders, 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	

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)

ABSTRACT

On 5-15-85 at 1415 hours, with a unit 1 startup in progress, it was observed that the unit 1 intermediate range high flux trip bistable tripped at 30% power. Technical Specification requires the trip setpoint to actuate at less than or equal to 25% power.

On 6-30-85, unit 2 was at 27% power during initial startup following refueling. At 1636 hours, it was observed that the intermediate range high flux trip bistables had not tripped.

An exact cause is not known, however it is felt that lack of experience in developing the intermediate range setpoints for low leakage cores was a contributor to this event.

The ability to accurately develop the intermediate range trip setpoint for low leakage cores will be refined as additional operating experience is gained.

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NRC Form 366A (9-83)

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

Intermediate Range Setpoint Non-Conservatism

1. Description of the Event

Unit 1

On 5-15-85 at 1415 hours, with a startup in progress, the assistant shift supervisor observed the actuation of the intermediate range channel, NI-36 high flux trip bistable at 30% equivalent thermal power. The NI-35 channel bistable tripped at an equivalent power of 31%. Although the intermediate range channel trips were already blocked according to the startup procedure, Technical Specifications requires the trip setpoint to actuate at less than or equal to 25% power.

Unit 2

On 6-30-85, Unit 2 was at 27% power during initial startup following refueling. At 1636 hours, it was observed that the intermediate range high flux trip bistables had not tripped. The NI-35 channel bistable was later found to trip at about 28% equivalent thermal power and NI-36 at 25%.

2. Probable Consequences

The intermediate range high flux trip is redundant to the source range high flux and power range high flux low setpoint trips, all of which are intended to reverse power excursions from low power. The safety analysis in the UFSAR does not take credit for the intermediate range trip, but relies on the power range trip.

One of the inherent characteristics of nuclear fuel is the addition of negative reactivity when the fuel temperature increases. This characteristic is called the Doppler effect. According to the UFSAR safety analysis, a fast rise in nuclear power resulting from a continuous reactivity insertion at low power will be terminated by the fast negative fuel temperature feedback of the Doppler effect. The event would then be terminated when the power range low setpoint trip initiated control rod insertion.

Assuming the most adverse combination of instrument and setpoint errors, the UFSAR expects the power range high flux low setpoint trip to actuate at 35% power. Since the intermediate range trips remained below this setpoint, all redundant trips were functional, and because of the reasons above, the health and safety of the public were unaffected and an unreviewed safety question was not created.

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Intermediate Range Setpoint Non-Conservatism

3. Cause

The exact cause of this event is not known. During initial power ascension following the last refueling, the erroneous intermediate range setpoints were developed. It is felt that lack of experience in developing the intermediate range setpoints for low-leakage cores was a contributor to this event.

Unit 1

Evaluation of the Unit 1, cycle 8 power history data and Control Room Operator's Data Sheets collected during initial power ascension following the cycle 7-8 refueling, indicated that the intermediate range setpoint was 2.1×10^{-4} amps at 25% power. This setpoint was consistent with delta T, calorimetric, and nuclear power range indications. However, based on the most current available data, the intermediate range setpoint should be 1.58×10^{-4} amps.

Unit 2

It was determined that the Unit 2 intermediate range setpoints for 25% power should be changed from 1.7×10^{-4} amps (projected for both NI-35 and and 36) to 1.21×10^{-4} amps for NI-35 and 1.50×10^{-4} amps for NI-36. This information was based on the Unit 2, cycle 8 power history data and Control Room Operator's Data Sheets collected during the initial power ascention following the cycle 7-8 refueling.

The ability to accurately develop the intermediate range trip setpoint for low leakage cores will be refined as additional operating experience is gained.

4. Immediate Corrective Action

Unit 1

When the Unit 1 intermediate range setpoint was found to be out of tolerance, its trip function had already been blocked and was not required to be operable until the unit is again shutdown.

Unit 2

The collection of data required to develop accurate Unit 2 setpoint currents was started when power ascention began. When the intermediate range setpoints were found out of tolerance, this data collection process continued so that more precise setpoints could be calculated.

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Intermediate Range Setpoint Non-Conservatism

5. Additional Corrective Action

Unit 1

The new Unit 1 setpoints will be changed before the unit undergoes another startup.

Unit 2

The new Unit 2 setpoints have been changed and reflect the most current values.

6. Action Taken to Prevent Recurrence

A North Anna Tech. Spec. change was submitted to the NRC to revise the intermediate range high flux trip setpoint from less than or equal to 25% of rated thermal power to less than or equal to a specified value. This is a more appropriate way to set the intermediate range detector setpoints since they cannot be calibrated to directly measure percent of rated thermal power. A similar Tech. Spec. change is planned for Surry contingent upon approval of the North Anna change.

7. Generic Implications

For a similar LER, see Unit 2, 83-027/03L-0. The problem of calibrating the IR trip setpoints in low leakage cores is generic to Westinghouse PWR's. As more data is accumulated on cores with low neutron leakage, the calculations for the intermediate range trip setpoints should become more precise.

VIRGINIA POWER

Surry Power Station
P. O. Box 315
Surry, Virginia 23883

July 30, 1985

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

Serial No: 85-016A
Docket No: 50-280
50-281
License No: DPR-32
DPR-37

Gentlemen:

Pursuant to Surry Power Station Technical Specifications, Virginia Power hereby submits the following Licensee Event Report for Surry Units 1 and 2.

REPORT NUMBER

85-010-01

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,

RF Saunders

R. F. Saunders
Station Manager

Enclosure

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

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