

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Virgil C. Summer Nuclear Station										DOCKET NUMBER (2) 0 5 0 0 0 3 9 5 1					PAGE (3) OF 4				
TITLE (4) Reactor Trip/Safety Injection																			
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	3	8	6	8	6	0	0	3	0	5	8	6	0	5	0	0	0
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 8: (Check one or more of the following) (11)																	
1		20.402(b)				20.405(c)				<input checked="" type="checkbox"/> 50.73(a)(2)(iv)				73.71(b)					
POWER LEVEL (10)		0 0 7				20.405(a)(1)(i)				50.38(c)(1)				73.71(a)					
		20.405(a)(1)(ii)				50.38(c)(2)				50.73(a)(2)(v)				OTHER (Specify in Abstract below and in Text, NRC Form 366A)					
		20.405(a)(1)(iii)				<input checked="" type="checkbox"/> 50.73(a)(2)(i)				50.73(a)(2)(vii)(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)(ix)									
LICENSEE CONTACT FOR THIS LER (12)																			
NAME A. R. Koon, Jr. Assoc. Manager, Nuclear Licensing										TELEPHONE NUMBER 8 0 3 3 4 5 7 5 2 9 9									
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																			
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS									
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR					
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO									

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

On February 3, 1986, at approximately 0740 hours, during a main turbine roll-up, a Reactor Trip and Safety Injection (SI) occurred from approximately seven percent power. The Reactor Trip and SI were a result of a steamline low pressure signal generated during the turbine roll-up. At approximately 400 rpm, the turbine control system experienced a malfunction which caused a rapid increase in turbine speed to approximately 1000 rpm. This rapid increase in speed resulted in a steam flow increase to approximately fifty percent of full steam flow and a rapid decrease in steam header pressure. Although steam header pressure did not decrease to the low pressure setpoint of 675 psig, the rate of decrease in steamline pressure was sufficient to actuate the steamline low pressure protection bistable due to rate compensation.

Plant systems responded as expected to the SI and Reactor Trip with the exception of the 'B' Train of Component Cooling Water (CCW). Following the SI actuation, the 'B' CCW pump did not automatically start due to an improper breaker alignment involving the swing CCW pump. This failure is attributed to a lack of operator understanding of a design interlock associated with the breaker alignment for swing components. The 'B' CCW pump was manually started and performed its intended function following the SI actuation.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

FACILITY NAME (1) Virgil C. Summer Nuclear Station	DOCKET NUMBER (2) 0 5 0 0 0 3 9 5 8 6 - 0 0 3 - 0 0	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
					0 2	OF	0 4

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

On February 3, 1986, at approximately 0740 hours, during a main turbine roll-up, a Reactor Trip and Safety Injection (SI) occurred from approximately seven percent power. The Reactor Trip and SI were a result of a steamline low pressure signal generated during the turbine roll-up. At approximately 400 rpm, the turbine control system experienced a malfunction which caused a rapid increase in turbine speed to approximately 1000 rpm. This rapid increase in speed resulted in a steam flow increase to approximately fifty percent of full steam flow and a rapid decrease in steam header pressure. Although steam header pressure did not decrease to the low pressure setpoint of 675 psig, the rate of decrease in steamline pressure was sufficient to actuate the steamline low pressure protection bistable due to rate compensation.

Plant systems responded as expected to the SI and Reactor Trip with the exception of the 'B' Train of Component Cooling Water (CCW). The 'B' Train CCW pump did not automatically start following the SI actuation. Operators manually started the CCW pump during the performance of the Immediate Operator Actions of Emergency Operating Procedure EOP-1.0, "Reactor Trip/Safety Injection Actuation". Subsequent review of the CCW system design indicates that the system functioned properly. Prior to the SI, the CCW system was aligned with the 'A' CCW pump running on the 'A' Train and the 'B' and 'C' CCW pumps aligned to the 'B' Train with both pumps in standby (breakers racked in). This alignment prevented the automatic start of either the 'B' or 'C' pump due to a design interlock. This interlock prevents the start of either pump when both are aligned to an inactive train. This system design feature is unique in that the interlock which is provided for protection of the power supply can cause the system to be inoperable when the proper breaker alignment is not maintained. The failure of a 'B' Train CCW pump to start automatically following the SI actuation was a result of a lack of operator understanding of this interlock and is attributed to inadequate communication of design information to training and operations personnel. If all three pumps are operable with breakers racked in, the swing ('C') pump must be aligned to the train with the operating pump. Information provided to operators in both the System Design Description and System Operating Procedure did not adequately address this design feature of the system. A contributing concern was also identified for delays in returning equipment to service following maintenance and modification activities. These delays were the result of a failure to process associated paperwork in a timely manner.

A similar condition existed on the 'B' Train of the Service Water (SW) system. Prior to the SI actuation, the 'C' SW pump was placed in operation for retest on the 'B' Train. The retest was being performed following maintenance activities on the torque switches for the pump discharge valve. Following a satisfactory retest, the 'C' SW pump was left in service on the 'B' Train, however, all of the paperwork had not been completed for return of the 'C' pump to an operable status.

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

Following the SI actuation, the 'C' SW pump was the operating pump on the 'B' Train with the 'B' SW pump locked out. Although the system performed its design function, the operating pump on the 'B' Train was technically inoperable. This condition, again, is attributed to a lack of operator understanding of the pump breaker interlocks.

The improper breaker alignment of the CCW system and the operation of the 'C' SW pump constitute a failure to meet Technical Specification operability requirements. Both conditions existed for approximately one hundred (100) hours which exceeded the period allowed by Technical Specification LCO's 3.7.3 and 3.7.4, by twenty-eight (28) hours. These conditions also resulted in a violation of Technical Specification 3.0.4.

The consequences of the CCW and SW misalignments are minor. The 'C' SW pump, although technically inoperable, performed its intended function following the SI actuation. The 'B' CCW pump, although technically inoperable, was manually started immediately following the SI actuation and adequately performed its intended function.

Corrective action was taken to determine the cause of the turbine control system malfunction. There were no problems identified either during trouble-shooting activities or the subsequent restart. The Licensee plans a program of increased system monitoring for the turbine Electro-Hydraulic Control (EHC) system during subsequent plant startups.

Additional corrective action includes:

- 1) Issuance of a Special Instruction to Operations's personnel concerning the breaker interlock design for all plant systems which contain swing pumps (i.e. Service Water, Component Cooling Water, Charging/Safety Injection, and Chill Water). This Special Instruction provides guidance concerning the required system alignments for various conditions of pump availability.
- 2) The information provided in this Special Instruction will also be incorporated into the Operator Requalification Training Program.
- 3) The System Operating Procedures and the System Design Descriptions for the CCW and SW systems will be revised to include the proper precautions concerning the breaker interlocks.
- 4) A modification to the plant's Bypassed and Inoperable Status Indication (BISI) system will be made to alert operators for a condition where improper breaker alignment would result in system inoperability.

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- 5) The Licensee will evaluate the administrative controls for close-out of maintenance and modification activities in an effort to reduce the period of time presently required to return systems and equipment to an operable status following work completion.
- 6) Operations has implemented a change to the Removal and Restoration program which requires the tagging of main control board controls for equipment which has been removed from service. These tags will reflect the inoperable status of equipment and prevent the use of inoperable equipment except under emergency conditions.

These actions are expected to preclude recurrence of events similar in nature to the breaker interlock concern.



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Dan A. Nauman
Vice President
Nuclear Operations

March 5, 1986

U.S. Nuclear Regulatory Commission
Document Control Desk
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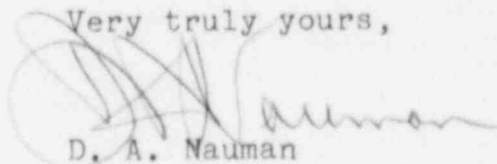
SUBJECT: Virgil C. Summer Nuclear Station
Docket No. 50/395
Operating License No. NPF-12
LER 86-003

Dear Sir:

Attached is Licensee Event Report #86-003 for the Virgil C. Summer Nuclear Station. This report is submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(i) and 50.73(a)(2)(iv).

Should there be any questions, please call us at your convenience.

Very truly yours,



D. A. Nauman

RMF/DAN:dwf
Attachment

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