



October 29, 1999
RC-99-0213

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Gentlemen:

Subject: VIRGIL C. SUMMER NUCLEAR STATION
DOCKET NO. 50-395
OPERATING LICENSE NO. NPF-12
LICENSEE EVENT REPORT (LER 1999-003-00)
INADEQUATE SURVEILLANCE TEST FOR CONTROL ROOM
VENTILATION TECHNICAL SPECIFICATION

Gary J. Taylor
Vice President
Nuclear Operations

Attached is Licensee Event Report No. 1999-013-00, for the Virgil C. Summer Nuclear Station (VCSNS). This report describes an inadequate surveillance performed on the "B" train Control Room Normal and Emergency Ventilation System due to an inadequate procedure. This issue is being reported per 50.73(a)(2)(i)(B).

Should you have any questions, please call Mr. Jim Turkett at (803) 345-4047.

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Very truly yours,

Gary J. Taylor

JT/GJT/dr
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NUCLEAR EXCELLENCE - A SUMMER TRADITION!

FACILITY NAME: Virgil C. Summer Nuclear Station
 DOCKET NUMBER: 05000395
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TITLE: INADEQUATE SURVEILLANCE TEST FOR CONTROL ROOM VENTILATION TECHNICAL SPECIFICATION

EVENT DATE			LER NUMBER			REPORT DATE			OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
09	29	1999	1999	013	00	10	29	99		05000

OPERATING MODE	POWER LEVEL	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more)											
1	100	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 73.71
		<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> OTHER	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(vi)	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	Specify in Abstract below or in NRC FORM 366A

LICENSEE CONTACT FOR THIS LER
 NAME: A. R. Rice
 Manager, Nuclear Licensing & Operating Experience
 TELEPHONE NUMBER (Include Area Code): (803) 345-4232

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	
D	VI			N						

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

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)
 V.C. Summer Nuclear Station (VCSNS) Technical Specification (TS) surveillance requirement (SR) 4.7.6.e.3 requires that the control room normal and emergency air handling system be demonstrated operable every 18 months by verifying the system starts on a simulated SI or high radiation test signal and provides a positive control room pressure with a maximum of 1000 cubic feet per minute (CFM) of outside air during system operation. This surveillance was performed on 3/9/99 just prior to a VCSNS refueling outage in accordance with surveillance test procedure STP 454.002, task sheet STTS 9900700, with data obtained through the performance of maintenance procedure MMP-460.024. The test was noted as satisfactory.
 Subsequent to the outage, VCSNS Plant Support Engineering (PSE) began a review of maintenance air handling procedures to assure conformance with accepted HVAC standards recognized by ASHRAE and SMACNA. PSE identified that a table in MMP-460.024 utilized to convert velocity pressure into air mass flow did not contain density corrections for the air temperature. Condition Evaluation Report CER-99-954 was initiated to identify the error in MMP-460.024. PSE initiated an evaluation of this error on air handling systems with respect to historical flow measurements. Airflow measurements taken on 3/9/99 for STP-454.002 were re-evaluated and found to exceed the 1000 CFM outside air allowed by TS for "B" train control room ventilation (CRV) system with an adjusted flow rate of 1082 CFM. Nonconformance Notice NCN-99-1289 was generated on 9/29/99 to determine system impact and corrective actions. The provisions of TS 4.0.3 were utilized. Disposition to this NCN included performance of the surveillance test under controlled conditions with the data analyzed to proper HVAC standards. Results of this test, performed on 9/30/99 were satisfactory and below the TS limit.
 The cause of this event is attributed to an inadequate procedure, MMP-460.024. A table used to adjust field measurements of air velocity pressure to airflow did not contain the proper density correction factors.
 No operability concerns currently exist, as testing of the "B" train CRV system was satisfactory. An analysis of the historical data for "A" and "B" trains of CRV was performed and resulted in no additional noncompliances. Engineering evaluated the potential dose consequences associated with this issue. A minor increase in dose would have occurred, however, doses would have remained well below the GDC 19 limits.

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PLANT IDENTIFICATION

Westinghouse - Pressurized Water Reactor

EQUIPMENT IDENTIFICATION

Control Room Normal and Emergency Ventilation System XAH0012B-AH

EIIS Code VI

IDENTIFICATION OF EVENT

Inadequate surveillance test for control room ventilation due to procedure deficiency. A table in HVAC mechanical maintenance procedure MMP-460.024 did not contain proper density correction factors for converting air velocity pressure into air mass flow.

EVENT DATE

Event Date - March 9, 1999
Discovery Date - September 29, 1999

REPORT DATE

October 29, 1999

CONDITIONS PRIOR TO EVENT

Mode 1 – Power Operation (100%)

DESCRIPTION OF EVENT

V.C. Summer Nuclear Station (VCSNS) Technical Specification (TS) surveillance requirement (SR) 4.7.6.e.3 requires that the control room normal and emergency air handling be demonstrated operable every 18 months by verifying the system starts on a simulated SI or high radiation test signal and provides a positive control room pressure with a maximum of 1000 CFM of outside air during system operation. This surveillance was performed on 3/9/99 just prior to a VCSNS refueling outage in accordance with surveillance test procedure STP 454.002, task sheet STTS 9900700, with data obtained through the performance of maintenance procedure MMP-460.024 and noted as satisfactory.

Subsequent to the outage, VCSNS Plant Support Engineering (PSE) began a review of maintenance air handling procedures to assure conformance with accepted standards recognized by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) and the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).

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DESCRIPTION OF EVENT (Cont'd)

PSE identified that a table in MMP-460.024, utilized to convert velocity pressure into air mass flow, did not contain density corrections for the air temperature. This condition existed since initial plant operation. Condition Evaluation Report CER-99-954 was initiated to identify the error in MMP-460.024.

PSE initiated an evaluation of this error on air handling systems with respect to historical flow measurements. It was through this evaluation that the current outside air issue was identified on 9/29/99. Airflow measurements taken on 3/9/99 for STP-454.002 were re-evaluated and found to exceed the 1000 CFM outside air allowed by TS for "B" train control room ventilation system with an adjusted flow rate of 1082 CFM. Nonconformance Notice NCN-99-1289 was generated on 9/29/99 to determine system impact and corrective actions. Disposition to this NCN included reperformance of the surveillance test with the data analyzed to proper HVAC standards. Results of this test, performed on 9/30/99 were satisfactory and below the TS limit.

CAUSE OF EVENT

The excessive "B" train outside airflow was not identified during the initial testing because the data was evaluated using an inadequate procedure. MMP-460.024 contains a table that provides incorrect density correction factors used to adjust field measurements. The table was obtained from a vendor manual and was included in the initial development of MMP-460.024. The vendor manual provides general guidance for balancing airflow in HVAC systems and should not have been used to develop a safety related procedure, rather the industry standards accepted by ASHRAE and SMACNA should have been incorporated.

Also, the procedure does not include steps for correcting actual airflow measurements to standard air conditions. This step is necessary to provide a comparison between actual field measurements and design values determined at standard conditions.

ANALYSIS OF EVENT

Two outside airflow tests were performed approximately 6 hours apart on 9/30/99. These measurements were obtained in accordance with MMP-460.024. The flow data was evaluated by PSE. The 9/30/99 tests produced flow rates of 795 standard CFM (SCFM) and 772 SCFM, which are within the TS limit of 1000 CFM. PSE determined these values utilizing standard HVAC (ASHRAE and SMACNA) density corrections because the methodology used in MMP-460.024 was incorrect.

The resultant flows were approximately 300 SCFM less than those recorded prior to the refueling outage. No maintenance was performed to the pressure boundary prior to or after these measurements. The values of each test were within approximately 3% of each other.

Based on this evaluation, the excessive flow measured during March 1999 most likely occurred because of inaccurate test data or unrestricted access to the control room boundary during the data collection. Due to the circumstances surrounding this event, VCSNS personnel did not have the opportunity to evaluate the data at the time of the 3/9/99 test to determine conclusively the reason for the high outside airflow.

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ANALYSIS OF EVENT (Cont'd)

There were no hardware or design deficiencies identified and no system adjustments were required. The procedure error resulted in a minor miscalculation of actual airflow when corrected for density variations. The magnitude of the resulting airflow error did not result in a reduction in the safety function of the control room normal and emergency ventilation system. Design basis documents were reviewed and identified that the GDC 19 limits for control room habitability allow an outside air intake of >2600 CFM in order to meet the limits for exposure to control room personnel.

INTERIM CORRECTIVE ACTIONS

The provisions of TS 4.0.3 were utilized. The "B" train was declared inoperable.

STP-454.002 was performed on "B" train control room ventilation system aligned for the emergency mode of operation. The test was performed instituting control room access restrictions. Control room pressure, outside airflow, and barometric pressure were measured. Data was provided to Plant Support Engineering for evaluation.

A system walkdown was performed to identify potential areas of leakage. None were found.

ADDITIONAL CORRECTIVE ACTIONS

MMP-460.024 will be revised to incorporate a density correction table based on standard conditions as accepted by ASHRAE and SMACNA. It will also provide the correct procedure steps to calculate ACFM and SCFM from field measurements.

STP-454.002 will be revised to specify that outside airflow shall be measured/calculated in SCFM. It will also provide precautions to ensure access to the control room pressure envelope is restricted during the outside airflow measurement.

Instrumentation and Control procedures ICP-100.003 and ICP-100.004 will be revised to specify that the airflow measurement and any subsequent transmitter adjustments be performed with the system in the emergency recirculation mode of operation. Also, precautions to limit access to the control room pressure envelope during the outside airflow measurement and adjustments will be added.

These actions will be documented in NCN 99-1289 and completed by November 2000.

PRIOR OCCURRENCES

None