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John L. Skolds
Vice President
Nuclear Operations

10CFR50.73

APR 29 1991

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
LER 90-009, REVISION 1

Attached is Revision 1, which updates the 'Additional Corrective Actions' section, to Licensee Event Report No. 90-009 for the Virgil C. Summer Nuclear Station. This report is submitted pursuant to the requirements of 10CFR50.73(a)(2)(ii) and (v).

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

Very truly yours,

John L. Skolds

DCH:JLS:lcd
Attachment

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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)
Virgil C. Summer Nuclear Station	0 5 0 0 0 3 9 5	1 OF 0 4

TITLE (4)
Design Defect in the Chilled Water System

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)
1 0	2 6	9 0	9 0	-	0 0 9	- 0 1	0 4	2 9	9 1		0 5 0 0 0
											0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)					
POWER LEVEL (10)	1 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)		
		20.405(a)(1)(i)	50.36(c)(1)	X 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)	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
W. R. Higgins, Supervisor, Regulatory Compliance	AREA CODE 8 0 3 — 3 4 5 - 4 0 4 2

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	
B	K M	R V R		N							

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 October 26, 1990, a 10CFR21 notification was made by Gilbert/Commonwealth, Inc., regarding a design defect in the Virgil C. Summer Nuclear Station (VCSNS) Chilled Water System. This design defect was discovered while evaluating the non-essential header isolation valve stroke time requirements. The design defect involves the inability of the expansion tank instrumentation to detect a loss of inventory due to a postulated failure of the non-essential header and actuate the non-essential header isolation valves. This could result in a loss of cooling to both trains of the Charging/Safety Injection pumps and the Component Cooling pumps. Upon receipt of the 10CFR21 notification, the isolation valves were immediately closed and placed under the control of Station Administration Procedure 201, "Danger Tagging." A permanent modification is being implemented to correct the design defect.

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

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

PLANT IDENTIFICATION:

Westinghouse - Pressurized Water Reactor

EQUIPMENT IDENTIFICATION:

Chilled Water System, EIIS - KM

IDENTIFICATION OF EVENT:

A design defect in the Chilled Water System reported by Gilbert/Commonwealth, Incorporated, under 10CFR21 resulted in being outside of the design basis of the plant and presented a significant safety hazard.

EVENT DATE AND TIME:

October 26, 1990, at 10:00 a.m.

REPORT DATE:

November 26, 1990

CONDITIONS PRIOR TO EVENT:

Mode 1, 100% power.

DESCRIPTION OF EVENT:

An evaluation of increased stroke time of the Chilled Water non-essential header isolation valves caused concern to be raised with respect to the validity of the design basis for the isolation valves. The concern was based on the apparent assumption of the design basis that the Chilled Water expansion tank would maintain adequate inventory during the time required for the isolation valves to stroke closed upon the postulated failure of the non-seismic and non-safety related portion of the system. On October 24, 1990, Gilbert/Commonwealth, Incorporated (G/C), the Architectural Engineer for the system, was asked to reevaluate the design basis for the isolation valves. This evaluation resulted in the discovery of a design defect which was reported by G/C under 10CFR21 on October 26, 1990.

The defect was reported as follows:

The Virgil C. Summer Nuclear Station (VCSNS) Chilled Water System consists of (2) redundant, closed cooling loops, each of which provides safety related chilled water to cooling coils in several safety related and several non-safety related components (see attached sketch). Water flow to all non-safety related cooling coils is stopped by automatic isolation valves actuated by a Safety Injection Signal or a low-low level signal (elevation 422'-8') from the expansion tank in each chilled water train. The expansion tanks are located at a low level (centerline elevation 423') relative to the high point of the system (centerline elev. 499'-10"), and rely on a pressurized air pocket to keep the Chilled Water System full of water. In the event of a postulated seismic occurrence, non-safety, non-seismic piping, equipment, and supports may become over-stressed, collapse and/or rupture. Although the expansion tank is initially pressurized so as to maintain the system filled to its high point, the tank must depressurize as level drops, before the level switch will actuate. For a rupture of the lowest non-safety piping (elevation 426'), the Chilled Water System may drain down to this elevation, without actuating the level switch in the expansion tank. Cooling water flow to most of the safety-related air handling units, which are above this elevation, could be lost. Depletion of water inventory may prevent the system from providing the necessary cooling water flow to the Charging pump, Component Cooling pumps, and safety-related air handling units. Loss of these safety functions could result in the inability to achieve safe shutdown conditions.

CAUSE OF EVENT:

The cause of this event was inadequate design of the Chilled Water expansion tank regarding its function to preserve system inventory.

ANALYSIS OF EVENT:

The condition of the system, represented by the 10CFR21 report, involves a potential hazard from a postulated event. It is important to note that the design defect was never challenged and never presented an actual compromise of safety to the plant.

IMMEDIATE CORRECTIVE ACTIONS:

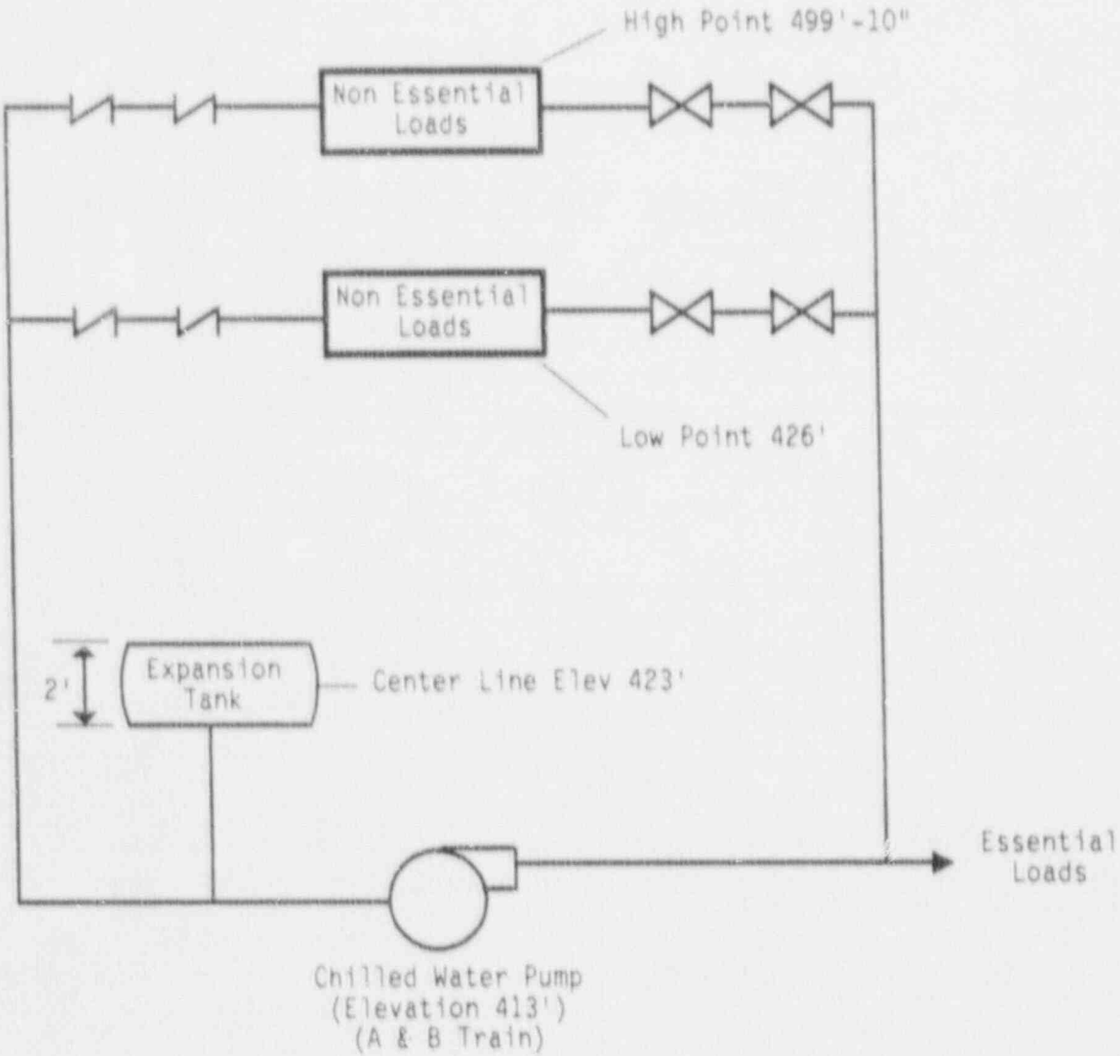
The non-essential header isolation valves have been closed and placed under the control of Station Administrative Procedure 201, "Danger Tagging."

ADDITIONAL CORRECTIVE ACTIONS:

A permanent modification is in progress which separates the non-essential portions of chilled water from the safety related chilled water system. The modification incorporates a new non-safety related Chilled Water System to supply the non-essential loads. These actions are being implemented by Modification Request Form (MRF)-?4054 and will be complete by October 31, 1991.

PRIOR OCCURRENCES:

None.



Essential Load Elevations

Battery Room Cooler - 428'-2"
ESF Switchgear Room Cooler - 456'-1.5"
Emergency Feedwater Room Cooler - 428'-2"
Control Room Ventilation - 486'-4"
Component Cooling Water Motor - 419'-1.5"
Charging Pump Room Cooler - 400'
Charging Pump Skid - 390'-1.5"
RHR Room Cooler - 390'-1.5"