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U.S. Nuclear Regulatory Commission
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Licensee Event Report 92-38-03, Docket 050237 is being submitted to provide an update concerning corrective action to prevent recurrence.

for 12-1-93
Gary F. Spedl
Station Manager
Dresden Station

GFS:slb

cc: J. Martin, Regional Administrator, Region III
NRC Resident Inspector's Office
File/NRC
File/Numerical

070025

IE22

LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1)	Docket Number (2)	Page (3)
Dresden Nuclear Power Station, Unit 2	0 5 0 0 0 2 3 7	1 of 0 5

Title (4)

Containment Cooling Service Water (CCSW) Found Outside Technical Specification Limits Due to an Inadequate Systems Interaction Analysis (supplement 3)

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 8	9 2	9 2	--- 0 3 8	--- 0 3	1 2	0 1	9 3	N/A	
									N/A	

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIRMENTS OF 10CFR (Check one or more of the following) (11)							
POWER LEVEL (10)	N	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)	
0 8 4		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)	
		20.405(a)(1)(iii)		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)	X	50.73(a)(2)(iii)		50.73(a)(2)(x)			

LICENSE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
Nicos P. Digrindakis, Technical Staff engineer Ext.3584	8 1 5 9 4 2 - 2 9 2 0

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	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 October 28, 1992 with Unit 2 at 88% power, an ENC-QE- 40.1 operability evaluation performed by the Nuclear Engineering Department (NED) recommended that the 2B Containment Cooling Service Water (CCSW) pump be declared inoperable because it could not be analytically proven to meet technical specification surveillance requirements of 180 psig discharge pressure when the CCSW room cooler flow and the backup control room HVAC condenser flows are considered. At 1835 hours on November 18, 1992 while performing CCSW pump testing (testing in response to LER 92-38 revision 0), the 2C CCSW pump did not meet its Technical Specification discharge pressure surveillance requirement. A root cause analysis has shown that the cause of this event was an inadequate systems interaction analysis during the design of the Backup Control Room HVAC modification (M12-2/3-82-1). Personnel error and management deficiency contributed to this event. The Technical Specification requirement of 180 psig discharge pressure is to ensure that CCSW pressure out of the heat exchanger is maintained 20 psig greater than LPCI system pressure to avoid an unplanned radioactive release. The 2B and 2C CCSW pumps would have (respectively) achieved 99.2% and 98.6% of their required discharge pressure of 180 psig. Therefore the safety significance of this event is minimal. Immediate corrective actions restored operability to the 2B and 2C CCSW pumps, while additional corrective actions included procedure changes to account for increased flow requirements and the installation of restricting orifices which eliminated the need for throttled valves. The occurrence is the first involving a CCSW pump being declared inoperable due to the effects of the backup control room HVAC cooling water flow.

PLANT AND SYSTEM IDENTIFICATION:

General Electric-Boiling Water Reactor-2527 MWt rated core thermal power.

Nuclear Tracking System (NTS) tracking code numbers are identified in the text as (XXX-XXX-XX-XXXXX)

EVENT IDENTIFICATION:

Containment Cooling Service Water (CCSW) Found Outside Technical Specification Limits Due to an Inadequate Systems Interaction Analysis (supplement 3)

A. CONDITIONS PRIOR TO EVENT:

Unit: 2 Event Date: October 28, 1992 Event Time: 1915 Hours

Reactor Mode: N Mode Name: Run Power Level: 88%

Reactor Coolant System (RCS) Pressure: 1003 psig

B. DESCRIPTION OF EVENT:

On October 28, 1992, an operability evaluation performed by the Nuclear Engineering Department (NED) in accordance with procedure ENC-QE-40.1 recommended that the 2B Containment Cooling Service Water (CCSW) pump be declared inoperable. The NED recommendation was made because the pump did not analytically meet the Technical Specification surveillance requirement of 180 psig discharge pressure (with a corresponding flow of 3500 gpm to the Containment Cooling Heat Exchanger), when the CCSW room cooler flow and the Backup Control Room Ventilation (HVAC) Air Conditioner condenser cooling water flow are considered. Followup actions resulting from the operability determination of the Unit 2 CCSW pumps were provided to the Station on November 9, 1992.

At 1835 hours on November 18, 1992, with Unit 2 at 84% power while performing CCSW pump testing (this testing was in response to LER 92-38 rev. 0). the 2C CCSW pump did not meet its Technical Specification surveillance discharge pressure requirement.

Additionally, on December 18, 1992 the CCSW tie to the Back up Control Room HVAC Refrigeration Condensing Unit had been isolated for more than 30 days. This exceeded Dresden Administrative Technical Requirements (DATR).

C. APPARENT CAUSE OF EVENT:

This report is submitted in accordance with 10 CFR 50.73 (a)(2)(ii), which requires the reporting of any condition that is outside the design basis of the plant.

The apparent cause of the 2B and 2C CCSW pumps being declared inoperable was an inadequate systems interaction analysis during the design of the Backup Control Room HVAC modification (M12-2/3-82-1). This modification consisted of adding an HVAC train (Air Handling Unit, Air Conditioning Unit, and Air Filtration Unit), based on a Control Room Habitability Study performed in response to NUREG-0737. A contributing factor to the improper analysis was the incorrect design assumption that two CCSW pumps would be available (powered by a diesel

generator) following a Loss-of-Coolant-Accident (LOCA) combined with a loss of offsite power. The Backup Control Room HVAC system effect on CCSW pump performance was not previously considered as a challenge to the Technical Specification Surveillance test requirement. Also, a Systems Interaction Checklist, which aids in the design of plant modifications, has been expanded since the time this modification was designed in 1982 and installed in 1984-1985.

While performing CCSW pump testing on November 18, 1992 it was discovered that CCSW flow to Control Room HVAC was in excess of 140 gpm (local flow indication was off-scale high). Previous analysis did not anticipate this excessive flow and therefore it under estimated the resultant effect of flow to Control Room HVAC on CCSW pump performance. This condition contributed to the 2C CCSW pump not meeting Tech Specs when previously it was analyzed to be within acceptable limits.

D. SAFETY ANALYSIS OF EVENT:

The CCSW pumps provide service water to the Containment Cooling Heat Exchangers which are part of the Low Pressure Coolant Injection (LPCI) System. The Technical Specification requirement of the 180 psig pump discharge pressure ensures that CCSW pressure at the heat exchanger outlet is maintained 20 psig greater than LPCI System pressure, to prevent the possibility of an unplanned release of potentially radioactive effluent to the CCSW System and to the environs.

The Backup Control Room HVAC Air Conditioning Unit is normally in a standby condition. Cooling water for the unit is normally supplied by the Service Water System. An emergency source of cooling water exists from the Unit 2 CCSW loops; there is no source from the Unit 3 CCSW loops. CCSW to the Air Conditioning Unit from the A loop (pumps 2A and 2B) is supplied via valve 2/3-1599-100. CCSW from the B loop (pumps 2C and 2D) is supplied via valve 2/3-1599-101. Further, the 2B and 2C CCSW pumps are enclosed in a single room; cooling water for the room coolers is provided by the 2B and 2C CCSW pumps themselves. The 2A and 2D CCSW pumps are not enclosed in rooms.

During Technical Specification surveillance testing of the Unit 2 CCSW pumps, flow to the Backup Control Room HVAC system is not usually present, and therefore its effect is not represented in test results. NED calculated that under current conditions, the Backup Control Room HVAC system cooled by CCSW would affect the discharge pressure of the Unit 2 CCSW pumps by 3.5 psig. Applying this correction to the most current 2B CCSW pump surveillance results would yield a discharge pressure of 178.5 psig. Therefore, while meeting the required flow of 3500 gpm, the 2B CCSW pump would have achieved 99.2% of its required discharge pressure of 180 psig; thus, the safety significance of this event is considered minimal.

The 2A and 2D CCSW pumps were shown to be able to each supply adequate flow to the Backup Control Room HVAC system, and meet Technical Specification surveillance flow and pressure requirements.

The occurrence of the 2C CCSW pump not meeting its required discharge pressure was determined to be of minimal safety significance at time of discovery, since the CCSW supply to the Backup Control Room HVAC system was isolated from the CCSW B loop.

E. CORRECTIVE ACTIONS:

On October 28, 1992, the immediate corrective action taken was to close valve 2/3-1599-100, which is the CCSW supply to backup control room HVAC from CCSW pumps 2A and 2B (CCSW A loop). This isolation restored operability of 2B CCSW pump. On November 9, 1992 the Nuclear Engineering Department issued the followup actions to the operability determination of the CCSW pumps. These followup actions confirmed the results of the original ENC-QE-40.1 operability evaluation of October 28, 1992 and also provided cooling water flow rate requirements for the CCSW room coolers and the backup control room refrigeration condensing unit based on variable inlet water temperature.

On November 18, 1992 when the 2C CCSW pump discharge pressure was found to be below Technical Specifications limits, the immediate corrective action was to close valve 2/3-1599-101, which is the CCSW supply to backup Control Room HVAC from CCSW pumps 2C and 2D (CCSW B Loop). This isolation restored operability of 2C CCSW pump.

Special Testing of CCSW as described in LER 92-38 Rev. 0 was completed November 20, 1992. During the performance of this special test, excess flow through the CCSW vault coolers was reduced. Also, excess CCSW flow to control room HVAC has been reduced.

Special testing confirmed that the effect of flow to the Back up Control Room HVAC Refrigeration Condensing Unit caused a drop in CCSW discharge pressure consistent with calculated values. The maximum required flow to the Back up Control Room HVAC Refrigeration Condensing Unit is 102 gpm. The Quarterly CCSW Pump Operability Surveillance was modified under a temporary procedure change to account for this flow. All Unit Two CCSW pumps were then tested on December 22, 1992 and all met their acceptance criteria. Currently, permanent procedure changes have been made to the Quarterly CCSW Pump Operability Surveillance to account for this flow to the Back up Control Room HVAC Refrigeration Condensing Unit.

During this special testing these flows were reduced by throttling valves. Presently, restricting orifices have been installed in these lines which have eliminated the need for throttling these valves. These modifications were completed prior to start up following the D2R13 refueling outage.

Corrective actions to prevent exceeding Dresden Administrative Technical Requirements (DATR) regarding Back up Control Room HVAC Refrigeration Condensing Unit operability involved revising the DATR's. The revised DATR's now require that if the control room air filtration unit (AFU) is made or found to be inoperable, restore the system to operable status within 14 days, or a be in a condition not requiring secondary containment.

F. PREVIOUS OCCURRENCES:

No previous occurrences were found involving Technical Specification requirements not being met due to the effects of Backup Control Room HVAC cooling, during a review of past reportable events of the LPCI, CCSW, and Control Room HVAC systems.

TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]

G. COMPONENT FAILURE DATA:

A component failure did not occur during this event; therefore, this section is not applicable.