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WC-194-96
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Docket No. 50-461

10CFR50.73

Document Control Desk
Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Clinton Power Station - Unit 1
Licensee Event Report No. 96-006-00

Dear Sir:

Enclosed is Licensee Event Report No. 96-006-00: Degraded Control Room HVAC Train Declared Inoperable During Redundant Train Outage Due to Inadequate Consideration of Degraded Equipment Results in Entry into Technical Specification 3.0.3. This report is being submitted in accordance with the requirements of 10CFR50.73.

Sincerely yours,

Wilfred Connell

Wilfred Connell
Vice President

RSF/csm

Enclosure

cc: NRC Clinton Licensing Project Manager
NRC Resident Office, V-690
Regional Administrator, Region III, USNRC
Illinois Department of Nuclear Safety
INPO Records Center

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NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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TITLE (4)
Degraded Control Room HVAC Train Declared Inoperable During Redundant Train Outage Due to Inadequate Consideration of Degraded Equipment Resulting in Entry Into Technical Specification 3.0.3

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 NAME	DOCKET NUMBER
									None	05000
05	29	96	96	006	00	06	25	96	FACILITY NAME: None	DOCKET NUMBER: 05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)	100		20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)
			20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
			20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
S. P. O'Riley, System Engineer	(217) 935-8881, Extension 3491

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
X	VI	MO	B515	Y						

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 15 single-spaced typewritten lines) (16)

With the plant in POWER OPERATION at 100 percent reactor power and the "B" train of the control room heating, ventilating, and air conditioning (HVAC) system out of service for a planned train outage, the "A" train of the HVAC system was declared inoperable due to a degraded air supply fan motor. With both trains inoperable, the conditions of Technical Specification (TS) 3.7.3, "Control Room Ventilation," were not met, thus requiring entry into TS 3.0.3. Engineers had been monitoring a deteriorating fan vibration condition. During the "B" train outage, the fan vibration increased resulting in the fan being considered inoperable. The cause of this event is attributed to personnel error by the work control group and Operations supervision due to inadequate consideration of equipment condition. Corrective action for this event includes briefing work control group and Operations personnel on this event emphasizing the need for confidence that redundant equipment is not degraded before removing counterpart equipment from service, and developing a standing order for work control.

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TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

DESCRIPTION OF EVENT

In November 1995, during routine equipment vibration monitoring, Plant Engineering noted an increase in vibration level on the "A" train control room heating, ventilating, and air conditioning system (HVAC) [VI] supply fan [FAN] 0VC03CA. The vibration data indicated a developing problem, but did not indicate a need for immediate action.

In December 1995, engineers determined that the fan vibration isolators [VB] were causing the vibration problem and needed to be replaced. The isolator parts were ordered in January 1996. Monitoring of the fan condition subsequent to November 1995 identified continued deterioration of the fan due to small increases in the vibration level.

On April 10, 1996, the vibration isolator parts were received on site and were installed. The replacement isolators reduced the vibration level but did not eliminate it.

On May 1, 1996, maintenance work request (MWR) D63064 was initiated to investigate the vibration problem, and on May 4, 1996, a consultant from the fan supplier was brought on site to assist in the investigation. The consultant recommended replacing the fan motor [MO] outboard bearing to correct the vibration problem. Plant Engineering continued trending the vibration readings, the bearing parts were ordered, and the work was scheduled. Trending during surveillance tests indicated that the fan remained degraded but was not deteriorating further.

The MWR was scheduled to be worked on June 10, 1996. The schedule was based on the expected delivery date of May 22, 1996 for the bearings, the history of the vibration problem, and completing a planned outage for the "B" train of the control room HVAC system scheduled to begin May 29, 1996. Plant Engineering, the work control group, and Operations supervision believed that the fan would run adequately to allow the planned "B" train outage to be performed as scheduled. For contingency, a plan was established to work the MWR earlier if vibration readings increased to an unacceptable level.

The bearings arrived on site on May 22, 1996, and were processed through receipt inspection and available for installation on May 23, 1996.

On May 28, 1996, at about 1330 hours, operators removed the "B" train of control room HVAC system from service and placed the "A" train into service in preparation for the planned train outage. When fan 0VC03CA was started, Plant Engineering measured its vibration level and noted a reading of 0.44 inches per second which was approximately the same reading as indicated during trending prior to the start of the outage. The supplier recommendation was to shut the fan down when fan motor vibration increased to 0.48 inches per second.

At about 1705 hours, the "B" train control room HVAC system air conditioning mode (Technical Specification 3.7.4) was declared inoperable and Operations and Maintenance personnel began removing refrigerant from the "B" control room HVAC chiller [CHU]. Plant Engineering measured the fan vibration level at about 1900 hours and ensured no further degradation was occurring prior to continuing the work.

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On May 29, 1996, at about 0020 hours, the "B" train control room HVAC system high radiation mode (Technical Specification 3.7.3) was declared inoperable for the planned train outage.

At about 0353 hours, with the plant in Mode 1 (POWER OPERATION) at 100 percent reactor [RCT] power, as planned, Plant Engineering again measured fan vibration level and informed Operations that the "A" train control room HVAC system supply fan motor 0VC03CA had degraded. The bearing vibration reading was 0.798 inches per second, greater than the manufacturer's recommended limit of 0.48. Plant Engineering recommended shutting the fan down. In response to the information, operators declared the "A" train of the control room HVAC system inoperable due to the high vibration condition on the supply fan motor. Declaring the "A" train inoperable placed the plant in a condition of having both trains of the control room HVAC system inoperable. Two Technical Specification required modes of the control room HVAC system were inoperable.

With two trains of the control room HVAC system high radiation mode inoperable in Mode 1, 2, or 3, Action D.1 of Technical Specification (TS) 3.7.3, "Control Room Ventilation System," requires an immediate entry into the limiting condition for operation of TS 3.0.3. TS 3.0.3 requires that the plant be placed in a Mode or other specified condition not requiring the control room HVAC system high radiation mode to be operable, by requiring, action be initiated within one hour to begin shutting the plant down.

With two trains of control room HVAC system air conditioning (AC) mode inoperable in Mode 1, 2, or 3, Actions B.1 and B.2 of Technical Specification 3.7.4, "Control Room Ventilation Air Conditioning (AC) System," require verification once per four hours that the control room area temperature is less than or equal to 86 degrees Fahrenheit (F), and restoration of one train of the control room HVAC AC system to operable status within seven days.

Condition report 1-96-05-067 was initiated to track a cause investigation and corrective action determination for this event.

At 0435 hours, operators verified that main control room area temperature was less than 86 degrees F.

At 0445 hours, operators shut down the "A" train of the control room HVAC system.

At 0507 hours, operators started the "B" train of the control room HVAC system. The "B" train control room HVAC system high radiation mode was declared operable at 0508 hours, and TS 3.0.3 was exited.

At 0520 hours, operators initiated the "B" train manual purge mode of the control room HVAC system with heaters [EHTR] turned off to maintain control room temperature less than or equal to 86 degrees F (while the "B" chiller was off) to prevent control room panels [PL] from overheating.

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At 0630, 0930, 1230, and 1505 hours, operators verified that main control room area temperature was less than 86 degrees F.

At 1532 hours, with main control room temperature at about 80 degrees F, reactor water cleanup system [CE] pumps [P] tripped and the Division 2 480-volt alternating current undervoltage alarm [ALM] actuated. Operators suspected the actuation may have been caused by elevated temperature in the main control room back panel area. Condition report 1-96-05-071 was initiated to track the back panel area temperature issue.

At 1702 hours, operators swapped the control room HVAC system "A" train chiller breaker with the "B" train chiller breaker because the racking gear in the "B" train chiller breaker was found to be degraded. During attempts to rack-in the breaker several hours earlier in the event, the "B" train chiller breaker was exhibiting racking difficulty. As a conservative measure, to ensure the breaker could be racked back out, operators decided to swap the breakers. Following the swap, operators started the "B" train chiller, and shut down the control room HVAC system manual purge mode. The "B" train chiller was considered available but not operable.

At 1737 hours, operators noted that the elevated temperature condition in the main control room back panel area had cleared.

At 1800 and 2100, operators verified that the main control room area temperature was less than 86 degrees F.

At 2215 hours, the "B" train control room HVAC chiller and air conditioning mode were declared operable.

On June 1, 1996, at 1425 hours, the control room HVAC "A" train was restored and declared operable following replacement of its supply fan motor bearings.

No automatic or manually initiated safety system responses were necessary to place the plant in a safe and stable condition. No other equipment or components were inoperable at the start of this event to the extent that their inoperable condition contributed to this event.

CAUSE OF EVENT

The cause of this event is attributed to personnel error by the work control group and Operations supervision due to an inadequate consideration of equipment condition. The outage for the "B" train of the control room HVAC system was initiated even though fan 0VC03CA motor bearing had been the object of specific monitoring since November 1995 when deterioration was identified through vibration analysis.

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Factors that contributed to the decision to perform the "B" train outage as scheduled included: an effort to perform planned train outages as scheduled due to the volume of work required to reschedule such work, historical evidence that the fan motor bearings tend to degrade gradually during steady operation, and failure to consider the impact of a bearing failure with the "B" train out of service and not readily available.

A contributor to the cause of this event was inadequate procedure guidance. NRC Inspection Manual Guidance 9900, "Maintenance--Voluntary Entry into Limiting Conditions for Operation Action Statements to Perform Preventive Maintenance," provides guidance on establishing confidence in the operability of redundant equipment before removing counterpart equipment from service for preventive maintenance. The manual states that if equipment is degraded or is trending toward a degraded condition, then its redundant counterpart should not be removed from service for preventive maintenance. Clinton Power Station has not provided this guidance in any procedure or standing order.

CORRECTIVE ACTION

Corrective action for this event includes briefing personnel and developing a standing order.

Briefings discussing this event will be provided to Operations and work control group personnel. The briefings will emphasize that there must be confidence that equipment is not degraded or trending toward a degraded condition before removing redundant counterpart equipment from service.

A plant manager's standing order (PMSO) will be developed and issued for work control. The PMSO will include the guidance from the NRC Inspection Manual regarding performance of on-line preventive maintenance.

ANALYSIS OF EVENT

This event is reportable under the provisions of 10CFR50.73(a)(2)(i)(B) due to the plant entry into the limiting condition for operation of TS 3.0.3, a condition prohibited by the Technical Specifications.

An assessment of the safety consequences and implications of this event indicates that this event was not nuclear safety significant. No train of control room HVAC high radiation mode was available for about one hour and fifteen minutes during this event. However, the high radiation mode was not called upon to perform its function.

Although fan 0VC03CA was degraded beyond the vendor recommended vibration limit, during the one hour and fifteen minute-period, it would have been capable of performing its design function if plant conditions had required it to do so. This capability is partially supported by the fact that the fan continued to run adequately for 52 minutes after it was declared inoperable, from 0353 hours until it was shut down at 0445 hours on May 29, 1996. Examination of the "A" train fan inboard and outboard bearings following their replacement identified some roughness, however both bearings were well lubricated and showed no signs of imminent failure.

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Additionally, the degraded fan was closely monitored by Plant Engineering during this event, and Operations was fully aware of its degraded condition from the start of the outage. The ability of operators to safely shut down the plant was not adversely affected during this event.

The "A" train control room HVAC system high radiation and air conditioning modes were inoperable from discovery of the fan condition at 0353 hours on May 29, 1996, until 1425 hours on June 1, 1996. The "B" train control room HVAC system air conditioning mode was inoperable from 1705 hours on May 28, 1996 until 2215 hours on May 29, 1996. The "B" train control room HVAC system high radiation mode was inoperable from 0020 hours on May 29, 1996 until 0508 hours on May 29, 1996.

ADDITIONAL INFORMATION

The "A" train control room HVAC system supply fan motor that had the high vibration condition during this event is model TAAM manufactured by the Buffalo Forge Company.

Clinton Power Station has not reported similar events in recent history regarding inadequate consideration of equipment condition.

For further information regarding this event, contact S. P. O'Riley, system engineer, at (217) 935-8881, extension 3491.