

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) **Clinton Power Station** DOCKET NUMBER (2) **05000461** PAGE (3) **1 OF 07**

TITLE (4) **Incorrect Command During Channel Functional Test Leaves Flush Valve Partially Open and Results in Inoperable Off Gas Pretreatment Radioactivity Monitor and Invalid Hydrogen Samples**

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	4	1988	88	015	00	06	08	88	NONE	050000	

OPERATING MODE (9) **4** THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 16 CFR § (Check one or more of the following) (11)

POWER LEVEL (10) 0100	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
	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)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iii)	X 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)(vii)(B)	
	20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12) NAME **D. W. Hillyer, Assistant Manager-Plant Radiation Protection** TELEPHONE NUMBER **217 935-8881** AREA CODE **x3313**

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	I	L	M	O	N	E	0	7	0	N

SUPPLEMENTAL REPORT EXPECTED (14) YES (If yes, complete EXPECTED SUBMISSION DATE) NO EXPECTED SUBMISSION DATE (15) MONTH DAY YEAR

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

ABSTRACT

On May 9, 1988, with the plant in Mode 1 (POWER OPERATION), a motor-operated flush valve on the off gas (OG) pretreatment process radiation monitor (PRM) was discovered to be partially open. The partially open valve caused the PRM to monitor instrument air instead of condenser effluent gas, and as a result, the PRM became inoperable. Immediate corrective actions included closing the flush valve, checking the PRM for proper response, and declaring the monitor operable. The cause of this event was attributed to utility Control and Instrumentation (C&I) technician error. On April 7, during a channel functional test (CFT), the C&I technician apparently gave a double command to the flush valve. This command caused the valve to remain partially open. During this event, the OG hydrogen monitors also became inoperable and, as a result of the partially open flush valve, hydrogen grab samples that were obtained at a sample station on the PRM, were also instrument air instead of condenser effluent. Corrective actions include personnel training on the event, revision of the CFT procedure to add clearer precautionary guidance and to add a procedural requirement to visually verify valve position, review of other procedures for similar deficiencies, review of the PRM design for enhancement, and operation of indicating lights to provide valve positions.

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TEXT (If more space is required, use additional NRC Form 306A's (1/77))

DESCRIPTION OF EVENT

On May 9, 1988, at approximately 0250 hours, with the plant in Mode 1 (POWER OPERATION) at approximately 91% reactor [RCT] power, a radiation protection (RP) technician identified that the radiation dose rate at the off gas [WF] pretreatment process radiation [IL] monitor (PRM) [MON] filter [FLT] housing was significantly less than expected. The technician identified the low dose rate after first noting that the pretreatment monitor cubicle was not posted as a high radiation area. The technician notified the RP shift supervisor of the low dose rate condition and an investigation was started to determine the reason for the low rate. At 0725 hours on May 9, the Operations shift supervisor was notified of the low rate, and declared the PRM (IRIX-PR034) inoperable.

At 1015 hours on May 9, after further investigation of the low dose rate, RP personnel determined that the dose rate of the PRM filter housing was low because a flush valve [V] on the PRM skid was partially open. This flush valve is a small motor-operated [MO] valve that allows flush air from the instrument air system [LD] to be supplied to the pretreatment PRM skid. The partially open flush valve caused the PRM to monitor instrument air instead of condenser [COND] effluent gas. As a result, the PRM became inoperable.

Immediate corrective actions included closing the flush valve, and checking the monitor for proper response. At 1050 hours on May 9, the PRM was declared operable by the Operations shift supervisor.

A review of this event identified that on April 7, 1988 at approximately 0125 hours, with the plant in Mode 4 (COLD SHUTDOWN) at approximately 175 degrees Fahrenheit (F) and atmospheric pressure, utility Control and Instrumentation (C&I) technicians performed a channel functional test of the PRM (which included operation of the flush valve).

On May 2, 1988, with the plant in Mode 2 at approximately 1% reactor power, startup of the off gas treatment system was initiated for the first time since recovery from the spring 1988 outage. At 2215 hours the "B" Steam Jet Air Ejector (SJAE) [EJR] was placed in service with the off gas system in the bypassed condition.

On May 2, 1988, at 2200 hours, the off gas hydrogen monitors were declared inoperable due to inadequate gas flow. Because of this condition, Chemistry obtained hydrogen grab samples until May 4, 1988 (0642 hours), when the "B" SJAE was taken out of service as power was reduced to support steam leak repair work. At 0720 hours on May 5, the off gas pretreatment radioactivity monitor, IRIX-PR034, was declared inoperable for repair of its process pump [P].

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APPROVED OMB NO 3150-0104
EXPIRES 8-31-86

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TEXT (If more space is required, use additional NRC Form 365A (1) (17))

On May 5, 1988, the "B" SJAE was placed back in service at 0715 hours with the hydrogen monitors still in an inoperable condition. At 0859 hours, the off gas treatment system was placed in service. Chemistry logs indicate that three hydrogen samples were taken on May 5, 1988, before the hydrogen monitors were returned to operable status at 2020 hours.

On May 6, 1988 at 1026 hours, PRM IRIX-PRO34 was declared operable.

On May 9, 1988, as described above, the partially open flush valve was discovered.

Chemistry personnel took hydrogen grab samples, as discussed above, from a sample station at PRM IRIX-PRO34 during the periods when the SJAE was in operation and the hydrogen monitor was inoperable. This corresponds to the time periods of May 2 at 2215 hours through May 4 at 0642 hours and May 5 at 0715 hours through 2020 hours. Since the instrument air flush valve on the PRM was later discovered to be partially open during these periods, instrument air (approximately 10 pounds per square inch gauge (psig)) was provided at a higher pressure than the condenser [COND] system [SH] at the off gas recombiner [RCB] effluent (partial vacuum). As a result, the samples obtained were invalid because they contained instrument air instead of main condenser effluent.

Technical Specification 3.3.7.12 requires that when the SJAE is in operation, the hydrogen monitors must be operable to monitor hydrogen concentration in the main condenser off gas treatment system. If the hydrogen monitors are inoperable, Technical Specification Table 3.3.7.12-1 allows continued operation of the main condenser off gas treatment system provided grab samples are collected at least once every four hours and analyzed within the following four hours. Since the hydrogen grab samples Chemistry took were later determined to be invalid, the requirements of Technical Specification 3.3.7.12 were not fulfilled.

Technical Specification 4.11.2.6 requires that the concentration of hydrogen in the main condenser off gas treatment system be determined to be less than or equal to four percent (by volume). This determination is made by using the hydrogen monitor (or as otherwise provided by Technical Specification Table 3.3.7.12-1), to continuously monitor the waste gases in the main condenser off gas treatment system whenever the main condenser evacuation system (SJAE) is in operation. Although hydrogen samples were taken during the periods when the hydrogen monitors were inoperable, as noted above, the samples were later determined to be invalid. Therefore the requirements of Technical Specification 4.11.2.6 were not fulfilled. This resulted in a condition in which the concentration of hydrogen in the main condenser off gas treatment system was unknown for an extended period of time.

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TEXT IF more space is required, use additional NRC Form 388A's (17)

According to Technical Specification 3.3.7.1 (Table 3.3.7.1-1), the off gas pretreatment radioactivity monitor is required to be operable during operation of the main condenser SJAE. The provisions of the corresponding action specified in Table 3.3.7.1-1 allows condenser effluent to be released to the environment provided a) the off gas treatment system is not bypassed and b) the post treatment air ejector off gas PRM high range noble gas activity monitor is operable. During the periods from 2215 hours on May 2 through 0542 hours on May 4, and 0715 hours through 0859 hours on May 5, the plant was operating in a condition during which main condenser off gas effluent was released to the environment with the off gas treatment system in the bypassed condition. Although this condition is allowed for limited periods of time by the Technical Specifications, this condition is not allowed when the off gas pretreatment monitor is inoperable as specified under Technical Specification 3.3.7.1. Since it was later determined that, due to the flush valve condition, PRM IRL-PRO34 was not operable during the periods noted above, the plant was operating in a condition prohibited by Technical Specification 3.3.7.1.

Technical Specification 4.11.2.7.1 requires the radioactivity rate of noble gases at the off gas recombiner to be continuously monitored to verify that the off gas radioactivity rate is within the limit specified under Technical Specification 3.11.2.7. Because of the flush valve condition, the off gas radioactivity rate was not properly monitored and the requirements of Specification 4.11.2.7.1 were not fulfilled. The corresponding periods of this violation were from May 2, 1988 at 2215 hours through May 4, 1988 at 0642 hours and May 5, 1988 at 0715 hours through May 9, 1988 at 1050 hours.

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 such that their inoperable condition contributed to this event.

CAUSE OF EVENT

The cause of this event is attributed to personnel error on the part of utility C&I technicians.

The flush valve is controlled from terminals in the Main Control Room and the RP office. Additionally, commands may be given locally by the pushbutton at the PRM skid or by using a portable terminal. A single command from the local pushbutton will cause the flush valve to cycle from a full close to a full open or from a full open to a full close position. If a second command is given while the valve is moving, the valve will cease movement or "freeze" in that position.

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TEXT (If more space is required, use additional NRC Form 306A's) (17)

The PRM was operating correctly prior to the spring 1988 outage which began March 19, 1988 and ended on May 5, 1988. Numerous work activities involving the PRM were conducted during the outage. Investigation of these activities determined that the flush valve was most probably left in the partially open position as a result of a double command to the flush valve during a channel functional test performed on April 7, 1988. During this test, the flush valve was cycled for performance of the flush sequence. C&I technicians conducted the test in accordance with surveillance procedure 9537.66, PRE-TREATMENT OFF GAS PRM IRIX-PRO34 CHANNEL FUNCTIONAL TEST, as post modification testing.

The vendor manual for PRM IRIX-PRO34 provides a warning that the flush valve may be left in the open position if the flush button is pushed again before the valve sequence is complete; this warning is provided in surveillance procedure 9537.66.

Because direct valve position indication is not provided, the procedure requires checking local flow indication to verify that the flush valve is open during flushing. When flushing is completed, the procedure requires returning the valve lineup to normal configuration (flush valve closed), but does not require verification of valve position. The procedure continues through a series of checks to verify that the monitor is operating normally. These checks include verifying normal system indication at the control terminal located in the RP office.

CORRECTIVE ACTION

Chemistry, RP, Operations, and C&I personnel who operate Area Radiation/Process Radiation equipment will be briefed on this event. This briefing is expected to be conducted by June 15, 1988 for Chemistry, RP and C&I personnel and by July 15, 1988 for Operations personnel.

Clearer precautionary guidance indicating the possible effects of a double command to the flush valve will be added in a revision to procedure 9537.66. Additionally, the revision will add a requirement to visually verify that the flush valve is closed following completion of the flush sequence. The procedure revision is expected to be issued by June 15, 1988.

Chemistry, RP and C&I Maintenance procedures that involve Area Radiation/Process Radiation systems will be reviewed for deficiencies similar to those in procedure 9537.66. This action is expected to be complete by July 31, 1988.

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TEXT (if more space is required, use additional NRC Form 288A's) (17)

Illinois Power will review the design of the PRM for possible enhancements such as installation of manually operated valves in place of electric motor operated valves, installation of double valves on the flush lines, installation of position indicators on valves, and operation of indicating lights to provide valve position. This review is expected to be complete by October 30, 1988.

ANALYSIS OF EVENT

This event is reportable under the provisions of 10CFR50.73(a)(2)(i)(B) because of conditions prohibited by the plant's Technical Specifications.

Assessment of the safety consequences and implications of this event indicates that the invalid hydrogen grab sample condition was not safety significant. Hydrogen levels observed when the flush valve was returned to its closed position on May 9 were in compliance with the Technical Specification limits. Additionally, a hydrogen detonation in the off gas treatment system analyzed in Chapter 15 of the Final Safety Analysis Report indicates that the equipment and piping are designed to contain any hydrogen-oxygen detonation which has a reasonable probability of occurring.

Assessment of the safety consequences and implications of this event indicates that the inoperable pretreatment PRM condition was not safety significant since the off gas post treatment monitoring system was operable during this event and continuously monitored plant effluent. The post treatment monitoring system verified that plant effluent was in compliance with Technical Specification limits.

Review of this event indicates that PRM IRIX-PRO34 was in an inoperable condition from April 7, 1988 at approximately 0125 hours, when the double command to the flush valve caused the valve to be left in the partially open position, until May 9, 1988 at 1050 hours when the monitor was declared operable following closure of the valve and a check of the monitor for proper response. The monitor was identified as inoperable at 0725 hours on May 9, 1988.

ADDITIONAL INFORMATION

IRIX-PRO34 is a pretreatment process radiation monitor manufactured by Eberline Instrument Corporation utilizing a SA-9 detector assembly,

LER 88-011-00 discussed unknown plugged inlet lines that caused the drywell air coolers' condensate monitoring system [IJ] to be inoperable and resulted in missed drywell atmosphere grab samples.

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TEXT (if more space is required, use additional NRC Form 366A 1/ (17))

LER 88-005-00 discussed a failure to recognize that the drywell atmosphere particulate radioactivity monitoring system [IJ] was inoperable which resulted in missed particulate grab samples.

LER 87-056-00 discussed a failure to recognize that hydrogen grab samples were required with both off gas treatment system [WF] hydrogen monitors inoperable.

LER 87-048-00 discussed off gas treatment system [WF] hydrogen samples that were obtained late because of poor communications, inadequate planning, and a manual valve that was stiff.

Although all of these previous LERs involved the failure to obtain grab samples, they occurred because of reasons different from this event.

For further information regarding this event, contact D. W. Hillyer, Assistant Manager - Plant Radiation Protection, at (217) 935-8881 extension 3313.

ILLINOIS POWER COMPANY



CLINTON POWER STATION, P.O. BOX 678, CLINTON, ILLINOIS 61727

10CFR50.73

June 8, 1988

Docket No. 50-461

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

Subject: Clinton Power Station - Unit 1
Licensee Event Report No. 88-015-00

Dear Sir:

Please find enclosed Licensee Event Report No. 88-015-00:
Incorrect Command During Channel Functional Test Leaves Flush Valve
Partially Open and Results in Inoperable Off Gas Pretreatment
Radioactivity Monitor and Invalid Hydrogen Samples. This report is
being submitted in accordance with the requirements of 10CFR50.73.

Sincerely yours,

A handwritten signature in cursive script, appearing to read 'F. A. Spangenberg, III'.

F. A. Spangenberg, III
Manager - Licensing and Safety

RSF/krm

Enclosure

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

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