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An Exelon/British Energy Company

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**Clinton Power Station**

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U-603440

2C.220

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Docket No. 50-461

10CFR50.73

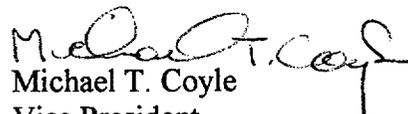
Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Subject: Clinton Power Station  
Licensee Event Report No. 2000-005

Dear Madam or Sir:

Enclosed is Licensee Event Report (LER) No. 2000-005: Losses of Secondary Containment Integrity During Movement of Irradiated Fuel Due to Unauthorized Opening of Boundary Doors and Failure to Adequately Verify Local Leak Rate Test Boundary Valve Position. This report is being submitted in accordance with the requirements of 10CFR50.73.

Sincerely yours,

  
Michael T. Coyle  
Vice President

RSF/blf

Enclosure

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

IE22

**LICENSEE EVENT REPORT (LER)**

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

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the 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. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

**FACILITY NAME (1)**

Clinton Power Station

**DOCKET NUMBER (2)**

05000461

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**TITLE (4)**

Losses of Secondary Containment Integrity During Movement of Irradiated Fuel Due to Unauthorized Opening of Boundary Doors and Failure to Adequately Verify Local Leak Rate Test Boundary Valve Position

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
10	22	2000	2000	005	00	11	20	2000	None	05000
									None	05000

OPERATING MODE (9)	POWER LEVEL (10)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)						
5	000	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  
J. C. Wemlinger, Corrective Action Coordinator Lead

TELEPHONE NUMBER (Include Area Code)  
(217) 935-8881, Extension 3846

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

**SUPPLEMENTAL REPORT EXPECTED (14)**

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

**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)**

Four times during the recent refueling outage Secondary Containment was breached during movement of irradiated fuel. On two occasions contract employees opened both doors of Secondary Containment boundary airlocks for a few minutes to transport scaffolding through the doors. The causes of the events were incorrect assumption of permission to open both doors based on assignment of work, and inadequate corrective action to prevent recurrence. Corrective action includes briefing work crews, coaching the involved individuals, informing site personnel about the event, and evaluating a more effective means to control a Secondary Containment airlock. On two occasions operators failed to ensure a boundary isolation valve for local leak rate testing was closed. The air-operated valve involved in both events had its air supply isolated and control power fuse removed. Operators were unaware of the fuse removal due to an error in the valve identification in the clearance that removed the fuse. This resulted in the valve being open when operators believed they had repositioned the valve to the closed position. The valve identification error was the cause of the event. Corrective actions include providing lessons learned to Operations personnel, and verifying valve position in the field when indicating lights are not lit.

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		2000	- 005	- 00	

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

DESCRIPTION OF EVENT

EVENT 1:

On October 22, 2000, the plant was in Mode 5 (REFUEL) for the seventh refueling outage (RF-7). Reactor coolant temperature was being maintained between 80 to 110 degrees Fahrenheit (F) and pressure was atmospheric. Secondary Containment was operable and movement of irradiated fuel assemblies was in progress. Fuel Building ventilation [VG] was in service providing secondary containment differential pressure.

At about 1427 hours, a radiation protection (RP) technician notified the Main Control Room that he discovered both doors [DR] of the Secondary Containment boundary airlock [AL] entry open to the Reactor Core Isolation Cooling (RCIC) System [BN] pump [P] room. A contract employee had defeated the interlock [IEL] that prevents both doors of the airlock from being open at the same time so that 10-foot scaffold poles could be transported through the doors and into the RCIC pump room to support scaffold erection in that area. Both doors were open at about 1415 hours causing a breach of Secondary Containment integrity and were immediately closed at 1417 hours when the condition was discovered.

During the approximately 2 minutes that both doors were open, the requirements of Technical Specification (TS) 3.6.4.1 to have at least one door closed in each access to the Secondary Containment during movement of irradiated fuel assemblies in the containment was not met. During this time, however, Secondary Containment vacuum remained greater than 0.25 inches water gauge as required by the Technical Specification. Condition Report 2-00-10-172 was initiated to track a cause and corrective action determination for this issue.

EVENT 2:

On October 25, 2000, the plant was in Mode 5 with reactor coolant temperature being maintained between 80 to 110 degrees F and pressure atmospheric. Secondary Containment was operable and movement of irradiated fuel assemblies was in progress. Fuel Building ventilation was in service providing secondary containment differential pressure.

At about 0552 hours, the Main Control Room received an alarm indicating a loss of Secondary Containment vacuum. In response to the alarm, operators immediately declared Secondary Containment inoperable, and suspended core alterations and movement of irradiated fuel assemblies in accordance with the Required Actions of TS 3.6.4.1. At about 0558 hours, the general foreman of a contract employee crew discovered that contract employees had both doors of a Secondary Containment boundary airlock entry open simultaneously so that scaffolding could be removed from the Auxiliary Building Steam Tunnel. The foreman immediately closed the doors and reported the condition to the Main Control Room. Secondary Containment integrity was restored at 0558 hours.

During the approximately 6 minutes that both doors were open, the requirements of TS 3.6.4.1 to have at least one door closed in each access to the secondary containment during movement of irradiated fuel assemblies was not met. Further, during this time, Secondary Containment vacuum was not maintained at greater than 0.25 inches water gauge as required by TS 3.6.4.1.

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DESCRIPTION OF EVENT (continued)

Condition Report 2-00-10-217 was initiated to track a cause and corrective action determination for this issue.

Prior to beginning the scaffold activity on October 25, the crew was briefed about the work, the importance of maintaining Secondary Containment integrity, and the loss of Secondary Containment integrity event that occurred on October 22. An investigation discovered that the interlock that prevents both doors of the airlock from being open at the same time had been disabled. The interlock was disabled to address concerns with personnel egress from a high radiation area and has been disabled for some time. This configuration allows both doors to be open at the same time, and established the conditions that made this event possible.

EVENT 3:

On October 27, 2000, the plant was in Mode 5 with reactor coolant temperature being maintained between 80 to 110 degrees F and pressure atmospheric. Secondary Containment was operable and movement of irradiated fuel assemblies was in progress. Fuel Building ventilation was in service providing secondary containment differential pressure. A local leak rate test (LLRT) of the 1B21-F016 and 1B21-F019 Main Steam Line Drain Isolation Valves was in progress.

At about 1245 hours, the vent path down stream of the isolation valves [V] was checked and air-operated LLRT boundary isolation valve 1B21-F033 was found open. With valve 1B21-F033 open, a communication pathway existed between an open 2-inch main steam vent line (vent valves [VTV] 1B21-F034 and 1B21-F035) located inside the Auxiliary Building Steam Tunnel (inside Secondary Containment) through valve 1B21-F033, through a 0.27 inch orifice, and to the Main Condenser [COND] (outside Secondary Containment). The pathway was open from about 1000 hours until about 1200 hours. Operators further recognized that the same condition had existed on October 26, 2000, during performance of an LLRT of the "C" Main Steam Isolation Valves (MSIVs) [ISV].

EVENT 4:

On October 26, 2000, the plant was in Mode 5 with reactor coolant temperature being maintained between 80 to 110 degrees F and pressure atmospheric. Fuel Building ventilation was in service providing secondary containment differential pressure. The draining lineups for the LLRT of the "C" MSIVs were completed, Secondary Containment was established and operable, and movement of irradiated fuel assemblies recommenced. Air-operated valve 1B21-F033 was an LLRT boundary isolation valve for Secondary Containment to prevent a Secondary Containment leakage path. However, valve 1B21-F033 was not closed as believed (as discussed above). At this time, a communication pathway existed between an open 2-inch main steam vent line (vent valves 1B21-F034 and 1B21-F035) located inside the Auxiliary Building Steam Tunnel (inside Secondary Containment) through valve 1B21-F033, through a 0.27 inch orifice [OR], and to the Main Condenser (outside Secondary Containment). The pathway was open from about 2000 hours on October 26 until about 0100 hours on October 27, 2000.

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DESCRIPTION OF EVENTS (continued)

During preparation of the LLRT line up on October 26, 2000, operators noted that valve 1B21-F033 was tagged in the open position under a safety clearance that showed the instrument air supply was isolated to the valve. Operators temporarily lifted the clearance to reopen the instrument air supply to the valve so the valve could be shut; however, the operator restoring the air supply failed to adequately check valve 1B21-F033 to ensure it was shut.

An investigation of this event determined that air-operated valve 1B21-F033 was open due to a loss of power to the valve. A control power fuse [FU], supplying valve 1B21-F033 had been removed under a safety clearance, preventing the valve from being closed. Review of the safety clearance identified the equipment description for this control power fuse incorrectly referenced the equipment identification as 1B21-F333, rather than 1B21-F033. This caused the fuse status to be overlooked during a review of the clearance performed on October 26, 2000. Per the clearance, valve 1B21-F033 was de-energized and failed-open since October 15, 2000.

The requirements of Technical Specification (TS) 3.6.4.1 to have all Secondary Containment penetrations required to be closed during accident conditions in the closed position during movement of irradiated fuel assemblies was not met with valve 1B21-F033 open during EVENTS 3 and 4. Condition Report 2-00-10-238 was initiated to track a cause and corrective action determination for this issue.

No automatic or manually initiated safety system responses were necessary to place the plant in a safe and stable condition. Other inoperable equipment or components did not directly affect this event.

CAUSE OF EVENTS

EVENT 1:

The cause of this event was the contract employee incorrectly assumed that permission was already granted to defeat the airlock and open both doors since he had been given a pre-job brief identifying the need to transport equipment through the airlock doors to build the scaffold.

EVENT 2:

The cause of this event was inadequate corrective action for Event 1. The briefing was a weak barrier for preventing recurrence of a Secondary Containment breach at the Auxiliary Building Steam Tunnel airlock due to the interlock being disabled. The crew thought that having both doors open together was acceptable when the second door opened without having to defeat any interlocks; these individuals had previously worked in the area when Secondary Containment was not in effect and both doors were allowed to be open at the same time.

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CAUSE OF EVENTS (continued)

EVENTS 3 and 4:

The cause of these events was an error in the equipment identification on the clearance that resulted in the operator believing he had adequately checked the valve as closed after restoring the air supply to the valve.

The operator had checked the clearances in preparation for the temporary lift (of the clearance) to restore the air supply. A technical reviewer had verified that there were no additional clearances that would keep valve 1B21-F033 open. The operator thought that he had verified the valve would close upon restoration of air, but because of the error in the equipment identification on the clearance, he did not know that the control power fuse had been pulled. The operator knew the indicating lights [IL] on the control switch [HS] for the valve were not lit, but did not realize that a loss of control power would cause the valve to fail open. The absence of the information that the control power was de-energized caused the operator and the technical reviewer to believe that restoration of air to the valve would cause it to close.

A contributing cause of this event was the outage schedule review failed to identify that valve work on the 1B21-F033 valve was occurring at a time when Secondary Containment was required due to refueling activities.

CORRECTIVE ACTION

EVENT 1:

Work Support personnel were briefed on this event and a discussion of this event was held with combined scaffold/laborer crews. The contract employee was coached and the individual was assigned to work in other areas. Further, a "Safety Alert" newsletter was distributed to site personnel to increase awareness of this issue; however, not until after EVENT 2 occurred.

EVENT 2:

Work Support personnel were briefed on this event, stressing the need to notify the Main Control Room if a situation with both Secondary Containment airlock doors open is discovered. A discussion of this event was held with combined scaffold/laborer crews. The contract employees were coached and the individuals were assigned to work in other areas. A "Safety Alert" newsletter was distributed to site personnel (as discussed above) to increase awareness of this issue.

CPS will evaluate more effective means for controlling Secondary Containment at the Auxiliary Building Steam Tunnel airlock.

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CORRECTIVE ACTIONS (continued)

Events 1 and 2 will be reviewed via the RF-7 Lessons Learned Program for potential future actions.

EVENTS 3 and 4:

Lessons learned from this event will be provided to all Operations personnel via shift night orders.

Outage Management will ensure that Secondary Containment boundary valves in the next refueling outage schedule are reviewed for clearances/work during outage periods when Secondary Containment is required.

The incorrect equipment identification for the fuse was corrected in the clearance database.

Following these events, the LLRT team began a practice of physically verifying valve positions in the field when the indicating lights in the Main Control Room were not lit.

ANALYSIS OF EVENT

These events are reportable under the provisions of 10CFR50.73(a)(2)(i)(B) as conditions prohibited by Technical Specification 3.6.4.1 that requires Secondary Containment to be operable during movement of irradiated fuel assemblies.

An analysis of the safety consequences and implications of the EVENTS 1 and 2, indicates that if either of the Secondary Containment boundary airlocks were open during a design basis accident, there would be a potential for increased Main Control Room and Offsite dose. However, during the occasions discussed herein, each of the two airlocks was open for a short duration; one airlock was open about 2 minutes and the other was open about 6 minutes. Further, alarm indication available in the Main Control Room alerted the operators to the loss of Secondary Containment vacuum for the 6-minute occasion. (No loss of vacuum occurred during the 2-minute occasion.) In response to the alarm, operators immediately declared Secondary Containment inoperable and took action to suspend movement of irradiated fuel assemblies as expected.

Engineering analyzed the leakage path through the vent valve, valve 1B21-F033, the 0.27-inch orifice and into the Main Condenser (that was open during EVENTS 3 and 4) for impact on the design basis accident. The analysis found no adverse effect on the integrity of the Secondary Containment and all design basis requirements were met because Secondary Containment integrity was preserved due to the orifice in the line.

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ADDITIONAL INFORMATION

No equipment or components failed during this event.

LER 86-002 reported a loss of Secondary Containment negative pressure while moving non-irradiated fuel due to defeating an airlock door interlock during initial fuel load. LER 90-016 reported a breach of Secondary Containment Integrity during core alterations in the second refueling outage due to defeating Secondary Containment door interlocks.

Clinton Power Station has not had any previous reportable events involving a breach of Secondary Containment resulting from the failure to adequately verify LLRT boundary valve positions.

For further information regarding this event, contact J. C. Wemlinger, Corrective Action Coordinator Lead, at (217) 935-8881, extension 3846.