

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: 50.0 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.

FACILITY NAME (1) Clinton Power Station		DOCKET NUMBER (2) 05000461	PAGE (3) 1 OF 4
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TITLE (4)
Opening Incorrect Electrical Cubicle Causes Loss of Shutdown Cooling and Leads to Failure to Meet Technical Specification Required Action in the Required Time

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	18	98	1998	036	00	11	17	98	None	05000
									None	05000

OPERATING MODE (9) 4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 000	20.2201(b)		20.2203(a)(2)(v)	<input checked="" type="checkbox"/>	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 Tim Staber, Shift Manager	TELEPHONE NUMBER (Include Area Code) (217) 935-8881, Extension 3101

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

SUPPLEMENTAL REPORT EXPECTED (14)					EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	<input checked="" type="checkbox"/>	NO						

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

On October 18, 1998, at 2241 hours, operations personnel were restoring a tagout when they opened the wrong electrical cubical door. This caused the low voltage auto trip relaying to trip the 1A1 reserve feed breaker de-energizing the Division 1 electrical bus. The Residual Heat Removal (RHR) "A" pump tripped off, causing a loss of shutdown cooling and forced circulation and the Division 1 diesel generator automatically started. Technical Specification Limiting Condition for Operation (LCO) 3.4.10, "RHR Shutdown Cooling System - Cold Shutdown," Required Action B.1, requires that reactor coolant circulation be established within one hour of the loss of shutdown cooling. Reactor coolant circulation was not established until three hours and fourteen minutes after shutdown cooling was lost. The cause of this event was attributed to a non-licensed operator opening the incorrect potential transformer fuse cubicle door. Shift supervision prioritized recovery activities and decided that it was prudent to establish Division I power from an offsite source prior to establishing forced reactor coolant circulation. Corrective actions for this event include: revising training on potential transformer location and purpose, communicating the event to on shift personnel, and evaluating the use of natural circulation as an acceptable method of reactor coolant circulation.

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

DESCRIPTION OF EVENT

On October 18, 1998, the plant was in Mode 4 (Cold Shutdown) with reactor [RCT] level being maintained between 70 and 100 inches using the shutdown range instruments and temperature being maintained between 95 and 100 degrees Fahrenheit, reactor pressure was atmospheric. At 2200 hours non-licensed plant operators were briefed on restoring safety tagout 98-1148 and performing a load dispatch switching order. The safety tagout was prepared in order to remove the reserve auxiliary transformer supply [XFMR] feed from service for maintenance on a disconnect switch. At 2241 hours, the non-licensed operators were restoring the safety tagout. The tagout restoration required the non-licensed operators to open the 1A1 main feed breaker [BKR] potential transformer [XPT] fuse [FU] cubicle door. However, the non-licensed operators opened the 1A1 Division 1 safety-related electrical bus [BU] potential transformer fuse cubicle door in error. The operators opened the front electrical cubicle door that contained the 1A1 Division I safety-related potential transformer fuses instead of the rear door as stated on the tagout restoration.

Opening the incorrect potential transformer fuse cubicle door caused the Division 1 electrical bus loss of power instrumentation to sense low bus voltage. This caused the low voltage auto trip relaying to trip the 1A1 reserve feed breaker. Since the 1A1 main feed breaker was already out of service, the Division 1 electrical bus was de-energized. Upon de-energization of the Division 1 electrical bus, the "A" residual heat removal (RHR) system [BO] pump [P] tripped, causing a loss of shutdown cooling and coolant circulation for the reactor vessel. The Division 1 emergency diesel generator [DG] automatically started and energized the Division 1 electrical bus. The RHR pump does not automatically restart when the bus is re-energized by the Division 1 emergency diesel generator.

Technical Specification Required Limiting Condition For Operation (LCO) 3.8.2 Action A.2.4 was entered, due to the loss of offsite power to the Division 1 electrical bus. This requires that action be taken to immediately restore a required offsite power circuit to an operable status. Technical Specification LCO 3.4.10 Required Action B.1 for loss of shutdown cooling was also entered. Required Action B.1 requires that reactor coolant circulation be verified using an alternate method within one hour. At Clinton Power Station, the accepted alternate method of reactor coolant circulation in Mode 4 is by use of forced circulation. The use of one of the reactor recirculation loops, residual heat removal system trains in the shutdown cooling mode of operation, or operation of one reactor water cleanup pump [P], are considered acceptable methods of establishing reactor coolant circulation.

The status of these forced circulation systems was such that none of them were immediately available. Shift Supervision did not want to challenge the Division 1 emergency diesel generator by starting the RHR "A" pump because, at the time, the emergency diesel generator was the only source of power to the Division I electrical bus. The RHR "B" pump, which is powered by the Division II safety related bus was available, but would need to be flushed and prepared for operation. This activity would exceed the one hour Required Action time. Reactor recirculation [AD] pump "A" was out of service for maintenance. Reactor recirculation pump "B" support systems were not available for startup. The reactor water cleanup system [CE] was out-of-service for maintenance. Shift Supervision determined that the most prudent success path for restoring reactor coolant circulation was the restoration of the "A" RHR system in the shutdown cooling mode of operation.

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Shift supervision referenced the reactor coolant time to boil curves and verified that time to boil was greater than 62 hours for reactor coolant. Shift supervision prioritized the recovery activities and determined that restoration of the offsite power circuit was the immediate priority followed by restoration of reactor coolant circulation.

Operations personnel entered the off-normal procedures for loss of AC power and loss of shutdown cooling. The operations staff pursued restoring offsite power. The procedure for restoration of offsite power requires that the automatic reclosure devices for the circuit breakers that provide 138 KV power to the Emergency Reserve Auxiliary Transformer (ERAT) be turned off. This is performed in a switchyard [FK] remote from the plant by personnel from the electrical transmission and distribution staff.

The loss of shutdown cooling off-normal procedure directs the operator to maintain reactor coolant level greater than 44 inches using the shutdown range reactor vessel level instruments. This level ensures that there is natural circulation of reactor coolant even without forced circulation. At the time of this event reactor water level was already greater than 44 inches and therefore, natural reactor coolant circulation had been established.

At 2341 hours, forced reactor coolant circulation had not been established and therefore, Technical Specification Required Action B.1 for LCO 3.4.10 was not completed. At 2355 hours, electrical maintenance personnel had completed the verification of the Division 1 potential transformer fuse integrity and the fuses were re-installed. On October 19, 1998, at 0035 hours, the RHR "A" loop was filled and vented. The automatic reclosure devices for the 138 KV feed to the ERAT were turned off at 0110 hours. At 0140 hours, the Division 1 emergency diesel generator was paralleled with an offsite power source and the emergency reserve auxiliary transformer was energized. At 0145 hours, the Division 1 emergency diesel generator was shutdown. At 0155, the "A" RHR pump was started and placed into service in the shutdown cooling mode of operation. This allowed LCO Required Action B.1 to be exited.

CAUSE OF EVENT

The cause of this event was attributed to a non-licensed operator opening the incorrect potential transformer fuse cubical door during tagout restoration. Shift supervision prioritized recovery actions based on plant conditions (i.e., low decay heat generation rate, reactor vessel coolant level, and available sources of electrical power), and determined that establishing a reliable offsite power source was the first priority followed by establishing forced reactor coolant circulation.

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CORRECTIVE ACTIONS

Learning opportunities for opening the incorrect potential transformer cubicle door were communicated to on-shift personnel in a shift night order. Training for potential transformers will be improved to include potential transformers purpose, location, potential pitfalls for error, and various potential transformer configurations.

Also, the ability to use natural circulation as a means to achieve reactor coolant circulation, as required by the plant Technical Specifications, will be evaluated and implemented in plant procedures, if determined to be acceptable.

ANALYSIS OF EVENT

This event is reportable per 10CFR50.73(a)(2)(i)(B) as operation of the plant prohibited by the Technical Specifications. LCO 3.4.10 Required Action B.1 was not completed within one hour as required by the plant Technical Specifications.

Failure to restore reactor coolant circulation within one hour had little impact on core cooling due to the minimal decay heat load at the time of the event. Reactor coolant temperature increased three degrees Fahrenheit during the three hours and fourteen minutes it took to restore forced reactor coolant circulation. If this event had occurred during reduced coolant inventory conditions, significant temperature stratification could have occurred. However, under these conditions the evaluation of the situation by the operating crew may have led them to restore shutdown cooling while the Division 1 electrical bus was being supplied by the Division 1 emergency diesel generator.

Clinton Power Station has not been fully analyzed for the effects of natural circulation as an alternate means of ensuring reactor coolant circulation. As a result of studies performed at other BWR-6 plants, natural circulation does provide reactor coolant circulation within the core area.

ADDITIONAL INFORMATION

Review of Licensee Event Reports for the last two years revealed one other occasion where Technical Specification LCO 3.4.10 Required Action B.1 was not completed within the required time. The cause of that event related to a lack of adequate work planning. However, if natural circulation of reactor coolant would have been an acceptable alternate reactor coolant circulation method, Required Action B.1 would have been met at that time.

For additional information on this event contact Tim Staber, Shift Manager, at (217) 935-8881, extension 3101.