

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

TITLE (4)

Inadequate Preventive Maintenance Leads to Possible Failure of Westinghouse DHP Circuit Breakers to Open on Demand

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
08	23	97	97	018	00	09	19	97	None	05000
									FACILITY NAME	DOCKET NUMBER
									None	05000
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
4		20.2201(b)			20.2203(a)(2)(v)			50.73(a)(2)(i)		50.73(a)(2)(viii)
POWER LEVEL (10)		20.2203(a)(1)			20.2203(a)(3)(i)			50.73(a)(2)(ii)		50.73(a)(2)(x)
000		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)			X 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

P. M. Thompson, Supervisor-Electrical Maintenance

TELEPHONE NUMBER (Include Area Code)

(217) 935-8881, Extension 3357

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
E	EB	52	W120	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)

On August 23, 1997, the plant was in Mode 4 (Cold Shutdown). Plant personnel were reviewing the results of the maintenance performed on three Westinghouse model DHP safety-related circuit breakers. During the review station personnel determined that the condition of the three circuit breakers was similar to the condition of two Westinghouse model DHP safety-related circuit breakers that failed to open on demand on July 22, and August 5, 1997. Because the condition of three of the circuit breakers was similar to that of the Westinghouse model DHP safety-related circuit breakers that had previously failed station personnel determined that the condition of the circuit breakers presented a condition that could have prevented the circuit breakers from fulfilling their safety function to shutdown the reactor and maintain it in a safe shutdown condition. The cause of the event was determined to be inadequate preventive maintenance (PM) performed on Westinghouse DHP circuit breakers. Corrective actions for this event include: performing preventive maintenance tasks on the circuit breakers to ensure circuit breaker operability, revise preventive maintenance procedures to provide better instructions for required maintenance, increase the frequency of the PM task on the circuit breakers from six to three years, and develop new PM task to periodically refurbish the circuit breakers.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Clinton Power Station	05000461	97	018	00	2 OF 4

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

DESCRIPTION OF EVENT

On July 22, 1997, at about 1307 hours Operations personnel were changing offsite power sources for the Division I electrical distribution system from the reserve auxiliary transformer [XFMR] to the emergency reserve auxiliary transformer. During this evolution the reserve feed circuit breaker [52] is closed and the main feed circuit breaker for Division I is opened. However, during this evolution the main feed circuit breaker did not open as expected. The circuit breaker local mechanical position indication revealed that the circuit breaker contacts were in an intermediate condition. In this condition the circuit breaker was still able to carry electrical load. This resulted in two separate offsite power supplies supplying the Division I electrical distribution system. The circuit breaker was subsequently de-energized and tripped in order to alleviate having two offsite power sources supplying the Division I electrical distribution system in parallel and to allow restoring the Division I electrical distribution system. The failed main feed circuit breaker is a Westinghouse 4160-volt safety-related model DHP circuit breaker.

A plan was developed by engineering and maintenance, with assistance from Westinghouse personnel, to determine the cause of the circuit breaker to fail to open. Various tests and inspections of the circuit breaker were performed onsite with the assistance of Westinghouse personnel to determine the cause of the circuit breaker to fail to open. This inspection and testing did not reveal any abnormalities that were believed to be the cause of the failure of the circuit breaker to open. The circuit breaker was then sent offsite to a Cutler-Hammer facility for further inspection. Cutler-Hammer is the current manufacturer of this type of circuit breaker. The inspections, tests and disassembly activities performed at the Cutler-Hammer facility did not reveal any single deficiency that could explain the failure of the circuit breaker to open on July 22, 1997. Inspections included checks of the following items: operating linkages for misalignment or physical damage, puffer tube assembly condition and alignment, degraded lubrication, loose debris, spring strength, bearings and trip latch.

On August 5, 1997, at about 0412 hours, during a swap of the residual heat removal pumps (RHR) [BO] from the "A" to the "B" RHR pump the "A" RHR pump circuit breaker failed to open on demand. The Division I electrical distribution system was de-energized and the failed circuit breaker left in its cubicle until a plan could be developed to determine the cause of the circuit breaker to fail to open on demand. The Division I and II AC electrical distribution systems were declared inoperable, as a conservative measure, by the Operations Shift Supervisor pending an investigation into the cause of the failure of the circuit breaker. This was done because both electrical distribution systems use Westinghouse 4160-volt safety-related model DHP circuit breaker circuit breakers as the electrical supply circuit breakers. These circuit breakers are not used in the Division III electrical distribution system.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Clinton Power Station	05000461	97	018	00	3 OF 4

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

On August 6, 1997, a team made up of circuit breaker manufacturer experts, independent circuit breaker experts, failure analysis experts, and site maintenance and engineering personnel was formed to determine the cause of the circuit breaker to fail to open. This team after extensive inspection and testing of the circuit breaker determined that the cause of the failure of the circuit breaker to open was that the sum of the opening forces in the circuit breaker were not sufficient to overcome the friction from rough and unlubricated main and auxiliary contacts and degraded lubrication. The friction in the contacts was the largest contributor to the additional friction force in the circuit breaker. However, at the time the condition of the other Westinghouse safety-related model DHP circuit breakers at the plant was indeterminate.

As part of the corrective action for the failure of the Westinghouse 4160-volt safety-related model DHP circuit breakers an inspection to correct problems and assess the condition of this type of circuit breaker was determined to be necessary. On August 23, 1997, during a review of the results of three of the inspections that had been performed station personnel determined that conditions similar to what caused the August 5, 1997, circuit breaker failure were present in other Westinghouse 4160-volt safety-related model DHP circuit breakers. The similarities noted were: rough and unlubricated main and auxiliary contacts and degraded lubrication. Because of these similarities it was believed that the physical condition of the installed circuit breakers presented a condition that could have prevented the circuit breakers from fulfilling their safety function to shutdown the reactor and maintain it in a safe shutdown condition.

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

CAUSE OF THE EVENT

The cause of the event was determined to be inadequate preventive maintenance performed on Westinghouse DHP circuit breakers. The preventive maintenance performed, under the preventive maintenance program, did not lubricate the main and auxiliary contacts in the circuit breakers as recommended by the circuit breaker manufacturer and also did not provide sufficient instructions to remove the roughness on the main and auxiliary contacts.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Clinton Power Station	05000461	97	018	00	4 OF 4

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

CORRECTIVE ACTION

All inservice Westinghouse DHP circuit breakers both safety related and non-safety related will have corrective maintenance tasks performed to reduce the friction in the operating mechanism. Particular attention is being paid to removing any roughness and lubricating the main and auxiliary contacts. Procedures that provide the instructions to perform this maintenance task on Westinghouse model DHP circuit breakers have been revised to lubricate the main and auxiliary contacts and provide better instructions on how to remove the roughness on the main and auxiliary contacts. Also, the frequency of performing the preventive maintenance task on Westinghouse DHP circuit breakers will be changed from once every six years to once every three years. A preventive maintenance task will be developed to require periodic refurbishment of the circuit breakers which will improve the condition of the circuit breaker lubrication and other circuit breaker components. Additional generic corrective actions concerning circuit breaker preventive maintenance will be detailed in the response to the Confirmatory Action Letter dated August 6, 1997.

ANALYSIS OF EVENT

This event is reportable under the provisions of 10CFR50.73 (a)(2)(v)(A) because the failure of the Westinghouse model DHP circuit breakers to open due to poor preventive maintenance could alone have prevented the safety function of systems required to shutdown the reactor and maintain it in a safe shutdown condition.

This condition is potentially nuclear safety significant. The Westinghouse model DHP circuit breakers are used on a number of safety related applications such as emergency core cooling system pumps, emergency diesel generator output circuit breakers and onsite safety-related electrical distribution system power supply circuit breakers. This condition could potentially affect the ability of the electrical distribution system to switch from one offsite power supply to the other, from an offsite power supply to the onsite power supply and required load shedding under accident conditions.

It is indeterminate when the condition of the Westinghouse 4160-volt safety-related model DHP circuit breakers was such that they could not be relied upon to open and perform their safety function.

ADDITIONAL INFORMATION

No additional equipment or components failed during this event.

Illinois Power has not reported occurrences of inadequate preventive maintenance causing equipment to not be able to perform its function in recent history.

For further information on this event contact P. M. Thompson, Supervisor Electrical Maintenance, at (217) 935-8881 extension 3357.