NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Peach Bottom Atomic Power Station - Unit 2	0 5 0 0 0 2 7 7	1 OF 0 7

TITLE (4)
Shutdown Cooling Isolation as a Result of Procedural Inadequacy

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 7	2 9	8 8	8 8	0 1 9	0 0	0 9	1 5	8 8		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N		20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0 0 0	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)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
W. C. Birely, Senior Engineer - Licensing Section	AREA CODE 2 1 5 8 4 1 - 5 0 4 8

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)	X NO				

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

Abstract:

On July 29, 1988 at 0950 hours, a Primary Containment Isolation System Group II actuation of shutdown cooling occurred as a result of a false high reactor pressure signal. At the time of the event, a maintenance electrician was lifting leads for the drywell floor drain isolation valve alarm relay (16A-K20) in the 20C42 control room panel to replace the relay for preventive maintenance. Lifting the 16A-K20 relay leads interrupted the neutral side of several other relays within the circuit which were not within the scope of the blocking permit. The circuit interruption resulted in the unexpected shutdown cooling isolation. There were no adverse consequences of this event. All of the affected equipment operated as designed. No physical deficiencies or irregularities were identified within the Primary Containment Isolation System, nor equipment damage occur as a result of this event. The cause of the event is procedural deficiency (blocking permit). The maintenance electrician immediately replaced the leads upon actuating the relays, and notified Operations. The isolation was reset and shutdown cooling was returned to service within five minutes. To prevent recurrence, a letter was issued to personnel normally assigned as blocking permit preparers and reviewers, which requires a review of all applicable drawings during permit preparation, and a review of selected previous similar LERs. In addition, the letter encourages panel walkdowns, wherever applicable, to verify permits.

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Unit Conditions Prior to the Event:

Unit 2 was in Cold Condition.

The "C" Residual Heat Removal (RHR) pump was operating in the shutdown cooling mode.

Description of the Event:

On July 29, 1988 at 0950 hours, a Primary Containment Isolation System (PCIS) Group II actuation of shutdown cooling (SDC) occurred as a result of a false high reactor pressure signal. In addition, two Group III isolation valves also received closure signals; however, these valves experienced no motion because they were in the closed position prior to the event. The actuation of an engineered safety feature is reportable under 10 CFR 50.73(a)(2)(iv). The details of the event are as stated below.

The 16A-K20 relay is the drywell floor drain isolation valve alarm relay. At the time of the event, a maintenance electrician was lifting the 16A-K20 leads in the 20C42 control room panel to replace the relay for preventive maintenance. Lifting the 16A-K20 relay leads interrupted the neutral side of several other relays within the circuit which were not within the scope of the blocking permit, resulting in the unexpected isolation (See Attachment 1). The following actuations occurred due to lifting the 16A-K20 leads:

Relay No.	Effects of Circuit Interruption
16A-K50	Relay de-energized generating a false high reactor pressure signal.
	Also, relays 16A-K29 and 16A-K54 de-energized, providing an isolation signal to the SDC inboard isolation valve (MO-2-10-18) and the Head Spray inboard isolation valve (MO-2-10-32).

16A-K55	Relays 16A-K30 and 16A-K55 de-energized to provide an isolation signal to the SDC outboard isolation valve (MO-2-10-17) and the Head Spray outboard isolation valve (MO-2-10-33). All valves isolated to the closed position and the "C" Residual Heat Removal (RHR) pump tripped.
16A-K33	Contacts opened to provide an isolation signal to the drywell 2-inch inboard vent valve (AO-2509). No valve motion occurred because it was in closed position prior to the event.
16A-K67	Contacts opened to provide an isolation signal to the drywell 2-inch outboard vent valve (AO-2510). No valve motion occurred because it was in the closed position prior to the event.

The maintenance electrician immediately replaced the leads when the relays actuated and informed operations personnel in the control room of the event. At 0955 hours, the isolation was reset and shutdown cooling was restored.

The duration of the event was five minutes.

Consequences of the Event:

There were no adverse consequences of this event for the following reasons. All of the affected equipment operated as designed. There were no physical deficiencies or irregularities

identified within the Primary Containment Isolation System (PCIS) logic, or equipment damage as a result of this event.

PCIS is designed as a "fail safe" type system. Thus when the 16A-K20 relay leads were lifted which interrupted power to the other affected relays, the isolation valves associated with these relays received closure signals and the "C" RHR pump tripped. Therefore, any potential release of radioactive material would have been precluded.

The consequences of the SDC isolation were minimal because the duration of the event was only five minutes, and because the decay heat load was minimal due to the reactor being shutdown for more than sixteen months. The consequences of the event could have been more significant with a greater heat load. In the unlikely event that SDC could not have been re-established, alternative methods of cooling could have been implemented as described in Peach Bottom General Plant Procedure GP-12, "Core Cooling Procedure". The procedure outlines alternative sources of makeup, including condensate transfer from stay-full lines, and Core Spray from the Condensate Storage Tank or Torus. The procedure outlines several methods of energy removal including draining to the Torus through RHR piping. It also provides guidance for other methods of makeup and energy removal depending on the reactor pressure and equipment availability.

The Reactor Head Spray system does not perform a safety-related function. Consequently, closure of the isolation valves on the Reactor Head Spray system would not impact plant safety.

Cause of the Event:

The cause of the event was procedural deficiency. Blocking permits are procedures for the removal and return to service of Plant equipment. The procedure (blocking permit) was deficient in that following the steps caused the interruption of the neutral side of relays which were not within the scope of the blocking sequence.

Training for permit and blocking preparation focuses primarily on the completion of the documents associated with a permit. Basic aspects of isolating sources of energy are presented; however,

control logic and interlocks with operating equipment are not fully addressed. Therefore, permit preparers and reviewers currently rely on common practices and past experiences. A varied range of knowledge of common practices and past experiences exist among the permit preparers and reviewers.

Corrective Actions:

The maintenance electrician immediately replaced the leads upon actuating the relays and notified Operations. Operations reset the isolation and returned SDC to service within five minutes. Application of the permit was suspended pending further review and revision to correct the deficiencies.

Actions Taken to Prevent Recurrence:

On August 15, 1988, a letter was issued to personnel normally assigned as permit writers and reviewers concerning the preparation of permits which deal with safety-related equipment logic circuitry. The letter states that all of the appropriate prints which illustrate the logic circuitry (M-1-S) terminal connections (M-1-EE) must be consulted during permit preparation. In addition, the letter requires a review of selected previous Peach Bottom LERs which exemplify events related to handling logic circuits. Finally, the letter encourages "walkdowns" of the applicable panels/components, whenever practical, to verify that the permit is in agreement with actual conditions.

To broaden the background of the permit writers and reviewers and make accessible previous experiences encountered regarding the preparation of blocking permits, guidance on developing this type of blocking permit will be placed in a section of the Peach Bottom Permits and Blocking Manual. The manual is being prepared by the Operations Group and is expected to be issued by September 30, 1988. Personnel normally assigned as permit writers and reviewers will read this section of the manual as part of their training.

Additionally, the "Root Cause Investigation of Shutdown Cooling Isolations" evaluation report, which was submitted to the NRC on June 9, 1988, was reviewed in conjunction with the preparation of

this LER. Additional corrective actions were identified within this evaluation report relating to the revision of the station "Rules for Permits and Blocking" manual, and identification of documents and drawings required for writing and reviewing permits involving complex logic circuits. These corrective actions are consistent with the proposed actions of this LER, and will further reduce the likelihood of recurrences of this event.

EIIS Codes:

The EIIS codes for the systems and components discussed in this LER are as follows: Containment Isolation Control System (PCIS) - JM; Residual Heat Removal System (shutdown cooling) - BO; Condensate Storage Tank - KA; Torus - BT; isolation valves - ISV; panel - PL; relay - RLY.

Previous Similar Occurrences:

LERs 2-87-03, 2-87-10, 2-87-17, 2-87-18, 2-87-24, 2-88-06, 2-88-10 and 2-88-14 address isolations which were caused by inadequate blocking permits.

Tracking Codes: D99 Other Procedural deficiency
Incorrect blocking permit

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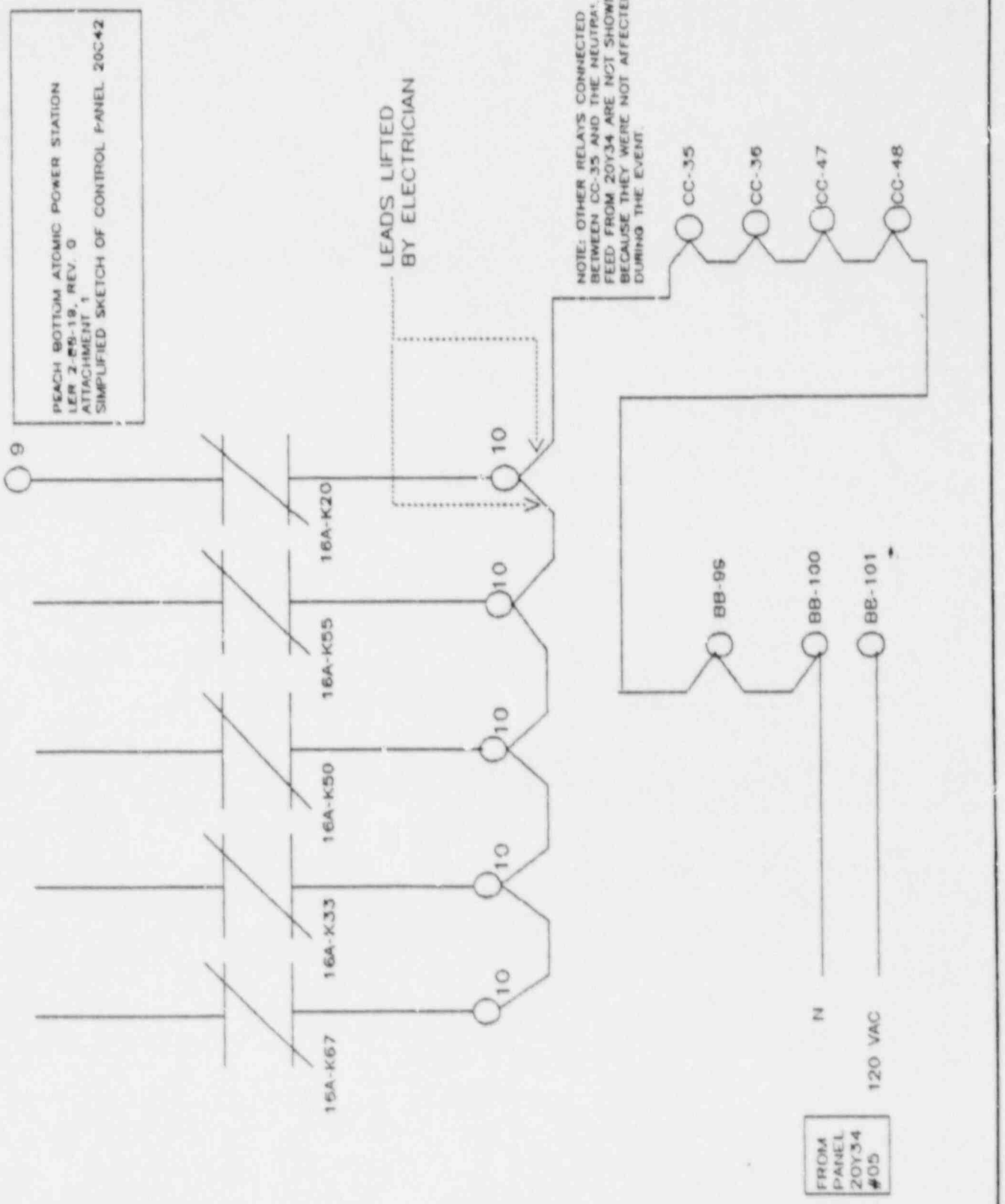
TEXT (If more space is required, use additional NRC Form 366A's) (17)

PEACH BOTTOM ATOMIC POWER STATION
LER 2-88-19, REV. 0
ATTACHMENT 1
SIMPLIFIED SKETCH OF CONTROL PANEL 20C42



10 CFR 50.73(a)(2)(iv)

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E. P. FOGARTY
MANAGER
NUCLEAR SUPPORT DIVISION

September 15, 1988
Docket No. 50-277

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

SUBJECT: Licensee Event Report
Peach Bottom Atomic Power Station Unit 2

This LER concerns a shutdown cooling isolation caused by a deficient procedure (blocking permit).

Reference:	Docket No. 50-277
Report Number:	2-88-19
Revision Number:	00
Event Date:	July 29, 1988
Report Date:	September 15, 1988
Facility:	Peach Bottom Atomic Power Station RD 1, Box 208, Delta, PA 17314

This LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv). This submittal has been delayed to allow an extensive review of the event and develop suitable actions to prevent the recurrence of this event. We regret the late submittal of this report and any inconvenience that it may have caused.

Very truly yours,

E. P. Fogarty
Manager
Nuclear Support Division

cc: W. T. Russell, Administrator, Region I, USNRC
T. P. Johnson, USNRC Senior Resident Inspector
T. E. Magette, State of Maryland
INPO Records Center

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