NRC FORM 366 (7-77)

U. S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT

CONTROL BLOCK: | | | | | | | (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

Field	Value
(1) Licensee Code	O H D B S 1 (2)
License Number	Ø Ø - Ø Ø N P F - Ø 3 (3)
License Type	4 1 1 1 1 (4)
CAT	(5)
Report Source	L (6)
Docket Number	Ø 5 Ø - Ø 3 4 6 (7)
Event Date	1 Ø 2 5 7 9 (8)
Report Date	1 1 2 1 7 9 (9)

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

At 1258 hours on 10/25/79, Reactor Coolant Pump (RCP) 2-2 tripped and with RCP 1-1 shutdown previously because of seal staging difficulties, the reactor tripped on a "Flux to number of RCPs" actuation. This placed the unit in the Action Statement of Technical Specification 3.4.1 and in violation of the Operating License Condition 2C (3)(a) which requires three RCPs in operation while in Modes 1 or 2. There was no danger to the health and safety of the public or station personnel. One RCP in each loop was operable during this trip. (NP-33-79-121)

System Code	Cause Code	Cause Subcode	Component Code	Comp. Subcode	Valve Subcode
C B (11)	B (12)	A (13)	R E L A Y X (14)	B (15)	Z (16)

(17) LER/RO REPORT NUMBER

Event Year		Sequential Report No.		Occurrence Code	Report Type		Revision No.
7 9	—	1 Ø 4	/	Ø 3	L	—	Ø

Action Taken	Future Action	Effect on Plant	Shutdown Method	Hours (22)	Attachment Submitted	NPRD-4 Form Sub.	Prime Comp. Supplier	Component Manufacturer
F (18)	X (19)	A (20)	C (21)	Ø 4 8 Ø	Y (23)	Y (24)	A (25)	C 6 4 9 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

RCP 2-2 tripped from a blown fuse in an RCP interlock circuit. The fuse blew because of a double grounding problem on the DC buses. One circuit was grounded through the case on the Couch (Deutsch) relays. Several additional grounds were found in the DC lighting distribution panels. Six maintenance work orders and two facility change requests were completed to correct the problems. By 11/14/79 the problems were resolved.

Facility Status	% Power	Other Status (30)	Method of Discovery	Discovery Description (32)
E (28)	Ø 7 2 (29)	NA	A (31)	Operator observation

Activity Released	Content of Release	Amount of Activity (35)	Location of Release (36)
Z (33)	Z (34)	NA	NA

PERSONNEL EXPOSURES

Number	Type	Description (39)
Ø Ø Ø (37)	Z (38)	NA

PERSONNEL INJURIES

Number	Description (41)
Ø Ø Ø (40)	NA

LOSS OF OR DAMAGE TO FACILITY (43)

Type	Description
Z (42)	NA

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PUBLICITY

Issued	Description (45)
N (44)	NA

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NRC USE ONLY

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GPO 917-926

TOLEDO EDISON COMPANY
DAVIS-BESSE NUCLEAR POWER STATION UNIT ONE
SUPPLEMENTAL INFORMATION FOR LER NP-33-79-121

DATE OF EVENT: October 25, 1979

FACILITY: Davis-Besse Unit 1

IDENTIFICATION OF OCCURRENCE: Reactor trip from loss of Reactor Coolant Pump (RCP) 2-2.

Conditions Prior to Occurrence: The unit was in Mode 1, with Power (MWT) = 1996, and Load (Gross MWE) = 660.

Description of Occurrence: At approximately 1256 hours on October 25, 1979, station personnel de-energized the 480 volt Lighting Distribution Switchboard Bus E5 to remove station transformer ST1 from service to install a new cable on the South Outdoor Distribution Center BY2 per a facility change request. At approximately 1258 hours, RCP 2-2 (in Reactor Coolant System (RCS) Loop 2) tripped. RCP 1-1 (in RCS Loop 1) had been shutdown previously because of seal staging difficulties. The Reactor Protection System (RPS) tripped the reactor on a "flux to number of RCPs" actuation. The turbine immediately tripped from the reactor trip.

This placed the unit in Action Statement (b) of Technical Specification 3.4.1 for Modes 1 and 2. The Technical Specification requires the operability of both reactor coolant loops and both RCPs on each loop. Action Statement (b) states that startup and power operation may be initiated and may proceed provided thermal power is restricted to less than 58.6% of rated thermal power.

The setpoints for high flux and flux- Δ flux-flow trip must be reduced within four (4) hours to the values specified in the Technical Specification 2.2.1.

In addition, this occurrence is not in accordance with the Operating License Condition 2C(3)(a) which requires at least three RCPs in operation while in Modes 1 or 2.

Designation of Apparent Cause of Occurrence: The cause of the reactor trip was the loss of RCP 2-2 from a blown fuse in the DC supply circuit feeding the non-safety related RCP auxiliary relay interlock circuit. This was verified on October 27, 1979, when the sequence of events was repeated several times, verifying that the loss of the 480 volt Lighting Distribution Switchboard Breaker BE510 caused the loss of RCP 2-2. The cause of the blown fuse and loss of RCP 2-2 has been determined to be a double grounding problem on the DC buses which was caused by an unexpected inductive surge in the circuit when the contacts open causing a shorting of the relay contacts to ground. The initial design did not anticipate the surge. Several other grounds were found in the DC lighting distribution panel, caused by improper initial installation. There is an interrelationship between breaker BE510, which automatically transfers to D112, a DC supply to feed DC lighting distribution panel L57E1 on a loss of AC (which is strictly non-essential) and DC motor control center 1 (for which the RCPs interlock circuits are powered).

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A separate deficiency discovered revealed improper initial wiring of the non-safety related RCP auxiliary relay interlock circuit in Relay Cabinet RC3717. The flow switch for component cooling water and seal makeup for RCP 1-1 was wired to RCP 2-2 and the flow switch for component cooling water and seal makeup for RCP 2-2 was wired to RCP 1-1 (positive leads only). This wiring error would not have caused misoperation of the RCPs. The only misoperation that would occur is if the control power fuse blew, the incorrect RCP would trip.

Analysis of Occurrence: There was no danger to the health and safety of the public or to station personnel. One other RCP in each loop was operable during the period that RCP 1-1 and RCP 2-2 were inoperable.

Corrective Action: Under Maintenance Work Order (MWO) 79-3346, the first occurrence was investigated. After testing and troubleshooting at the station, it was found that the RCP interlock circuit was grounded through the case on the Couch (Deutsch) relays by an inductive surge in the circuit. Later tests by the manufacturer proved this statement to be correct. As a followup, MWOs 79-3460, 79-3472, and Work Request IC-093-70-79 were issued to troubleshoot for additional problems. Several additional grounds were found in the DC lighting distribution panels and DCMCC2. These grounds have all been cleared under the above MWOs.

Under Facility Change Request (FCR) 79-378, arc suppression diodes for the RCP interlock circuits were added to suppress an inductive voltage caused by the interruption of time delay coil circuits on 125 volt DC. Arc suppression diodes were also added to several other circuits under this FCR.

Under MWOs 79-3431 and 79-3508, the non-safety related relay cabinet (RC 3719) wiring was scheme checked. The wiring deficiency was a result of original field installation work. Under the above work orders, the wiring was corrected and FCR 79-375 was prepared to correct drawings to an as-built condition.

As a followup, MWO 79-3509 replaced all the Couch (Deutsch) relays for the component cooling water (seal cooling water) and reactor coolant seal injection flow switches for all four pump interlock circuits.

On November 14, 1979, all four RCP interlock auxiliary relay circuits were picked up in their normal configuration for running pumps. At this time, the 480 volt lighting distribution switchboard E5 (breakers BE508 and BE510 and F5 (breakers BF503 and BF510)) were opened and automatically transferred to DC lighting distribution panels L37E1, L57E1, L49E1 and L41E1. No fuses blew in the RCP interlock circuits.

Failure Data: There have been previous reports of loss of RCPs from blown fuses, see Licensee Event Reports NP-33-78-129 and NP-32-79-11.