



July 7, 2000

United States Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

Operating Licenses DPR-58 and DPR-74  
Docket Nos. 50-315 and 50-316

Document Control Manager:

In accordance with the criteria established by 10 CFR 50.73 entitled Licensee Event Report System, the following report is being submitted:

LER 316/2000-004-00, "Partial Loss of Offsite Power Results in Start of Emergency Diesel Generators".

The following commitments were identified in this submittal:

- The Interface Agreement between CNP and AEP Western Transmission Region will be revised by September 6, 2000, to require concurrent verification of switching operations in the switchyard by operations department personnel.
- Training will be developed for the operators by September 29, 2000, to reinforce the expectations regarding 1-hour TS Action Statement requirements.

Should you have any questions regarding this correspondence, please contact Mr. Robert C. Godley, Director, Regulatory Affairs, at 616/465-5901, extension 2698.

Sincerely,

A handwritten signature in black ink, appearing to read "A. Christopher Bakken, III". The signature is written in a cursive style with a large, circular flourish at the end.

A. Christopher Bakken, III  
Site Vice President

/mbd  
Attachment

c: J. E. Dyer, Region III  
R. C. Godley  
D. Hahn  
W. J. Kropp  
R. P. Powers  
R. Whale  
NRC Resident Inspector  
Records Center, INPO

JE22

**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-8 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)

Donald C. Cook Nuclear Plant Unit 2

DOCKET NUMBER (2)

05000-316

PAGE (3)

1 of 4

TITLE (4)

Partial Loss of Offsite Power Results in Start of Emergency Diesel Generators

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	
06	08	2000	2000	-- 004 --	00	07	07	2000	Cook Plant Unit 1	05000-315	
										FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)		4		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)		00		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)		<input checked="" type="checkbox"/>		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

M. B. Depuydt, Regulatory Affairs

TELEPHONE NUMBER (Include Area Code)

616 / 465-5901, x1589

**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).  NO

**EXPECTED SUBMISSION DATE (15)**

MONTH DAY YEAR

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

On June 8, 2000, at 0931 hours EDT, with Unit 1 defueled and Unit 2 in Mode 4, reserve power to the Train A busses on both units was lost during switching operations in the 34.5 kV switchyard. The Unit 1 and Unit 2 CD Emergency Diesel Generators (EDGs) started and picked up load as expected. The Spent Fuel Pool (SFP) Cooling pump in service tripped, but was restored at 0953 hours following a 1 degree Fahrenheit (F) temperature rise in the SFP. All 4 Reactor Coolant Pumps (RCPs) on Unit 2 tripped as designed. While on natural circulation, the Reactor Coolant System cooled down approximately 20 degrees F due to low decay heat and increased auxiliary feedwater flow. Two RCPs were returned to service by 1159 hours. This LER is submitted in accordance with 10CFR50.73(a)(2)(iv), any event that resulted in an automatic actuation of any Engineered Safety Feature, and in accordance with 10CFR50.73(a)(2)(i)(B), for failure to complete the surveillance requirement of Technical Specification 3.8.1.1.a, " AC Power Sources", within 1 hour.

The root cause of this event was personnel error. The Interface Agreement between Donald C. Cook Nuclear Plant and American Electric Power's Western Transmission Region will be revised to require concurrent verification of switching operations in the switchyard by operations department personnel. The missed surveillance was due to failure of the responsible crew members to complete an evaluation of the event for its impact on compliance with TS requirements in a timely manner due to the plant transient response. Training will be developed for the operators to reinforce the expectations regarding 1-hour TS action statement requirements.

The safety significance of this event was evaluated and found to be minimal. All expected actions for a loss of power to a bus occurred, including load shed, start of the EDGs on both units and sequencing of loads onto the EDGs.

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TEXT CONTINUATION**

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		2000	--	004	--	00

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

**Conditions Prior to Event**

Unit 1 was defueled  
Unit 2 was in Mode 4, Hot Shutdown

**Description of Event**

On June 8, 2000, switching operations commenced in the 34.5 kV switchyard to realign reserve feed to both units such that Train A bus loads would be fed from Transformer (TR) 4 and Train B bus loads would be fed from TR-5. TR-4 output breaker "BC" was closed. 34.5 kV crosstie breaker "BD" was then opened to separate the 34.5 kV busses. After the "BD" breaker disconnects on the TR-5 side were opened, the first disconnect on the TR-4 side of the breaker was opened. At 0931 hours EDT, when the first disconnect on the TR-4 side of breaker "BD" was opened, breaker "BC" re-opened, resulting in the loss of the 34.5 kV reserve feed to Unit 1 and 2 Train A busses.

The loss of reserve feed resulted in the automatic start of the CD Emergency Diesel Generators (EDGs) on both units. Both EDGs started and loaded as expected, and both units entered the procedure for loss of offsite power while shutdown.

The partial loss of offsite power resulted in Unit 2 entering multiple Technical Specification (TS) Action Statements. TS 3.8.1.1.a, AC Power Sources, was entered due to the partial loss of reserve feed. The requirement of the Action Statement to demonstrate the operability of the remaining AC offsite source within 1 hour was not met.

TS 3.4.1.3, Reactor Coolant System (RCS) Loops, was entered due to the trip of all 4 operating Reactor Coolant pumps (RCPs). When power was lost to the Train A bus, RCPs 22 and 23 tripped. The 4 kV bus under-frequency signal then caused the RCPs 21 and 24 to trip as expected. As a result, Unit 2 was in the natural circulation mode using the steam generators as a heat sink. RCP 24 was restarted at 1047 hours (duration: 1 hour 16 minutes), restoring the required 1 loop to operation, and the Action Statement was exited.

TS 3.6.2.1, Containment Spray (CTS), was entered after manual action was taken to isolate Essential Service Water (ESW) to the CTS heat exchanger. This action was taken in response to the discovery that the safety valve on the ESW side of the heat exchanger lifted and failed to fully reseal, resulting in a leak of approximately 3 gallons per minute. The valve lifted in response to the ESW system pressure transient resulting from the restart of the ESW pumps. The valve was replaced and CTS declared operable at 1115 hours on June 9, 2000.

For Unit 1, the in-service Spent Fuel Pool (SFP) Cooling pump was load shed when the Train A bus was de-energized. Cooling was restored at 0953 hours.

The safety valve on the ESW side of the Unit 1 Component Cooling Water (CCW) heat exchanger lifted and did not fully reseal, resulting in a leak of less than 1 gallon per minute. This safety valve lift is also attributed to the ESW system pressure transient resulting from the restart of the ESW pumps. The safety valve later reseated and the leakage stopped.

At 1311 hours EDT on June 8, 2000, this event was reported in accordance with 10CFR50.72(b)(2)(ii). This LER is therefore reported in accordance with 10CFR50.73(a)(2)(iv), for any event that resulted in an automatic actuation of any Engineered Safety Feature. Additionally, this LER is submitted in accordance with 10CFR50.73(a)(2)(i)(B), for failure to complete the surveillance requirement of Technical Specification 3.8.1.1.a, "AC Power Sources", within 1 hour.

**Cause of Event**

The root cause of this event was personnel error, as the incorrect disconnect switch was manipulated. Switching operations in the switchyard, performed by American Electric Power's (AEP) Western Transmission Region personnel, do not receive the same level of verification as activities inside the plant. The disconnect switches for the 34.5 kV crosstie breaker "BD" are directly adjacent to the disconnect switches for Grounding Transformer TR-3. Instead of opening the

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disconnect switch for Breaker "BD", the disconnect switch for Grounding Transformer TR-3 was opened instead. Opening one phase on the grounding transformer caused the TR-4 phase imbalance relay to activate. This resulted in breaker "BC" opening and loss of power to the Train A busses.

The cause of the missed surveillance was failure of the responsible crew members to complete an evaluation of the event for its impact on compliance with TS requirements in a timely manner. This failure was caused by inadequate reinforcement of 1 hour action statement requirements through training.

The failure of the Unit 2 ESW safety valve to fully reseal is attributed to an undersized gasket that allowed the guide pin to impede travel of the valve stem.

**Analysis of Event**

The automatic responses to this event were correct and in accordance with plant design. Upon operation of the undervoltage relays on the Train A busses on each unit, load shed and start of the Unit 1 and Unit 2 CD EDGs occurred. The EDGs picked up load as designed, re-supplying power to the busses. A summary of operations that outlines the expected and actual sequence of events is provided below.

Expected	Actual
Opening of disconnect on Grounding Transformer TR-3 results in voltage imbalance on Transformer TR-4 output	Event Initiator
Voltage imbalance detected by Relay 59T4	As expected
Relay 59T4 actuates resulting in trip of 34.5kv Breaker "BC"	As expected
Power is lost to the Unit 1 and 2 Train A busses	As expected
RCPs 22 and 23 trip	As expected
Under-frequency trip actuates and causes trip of RCPs 21 and 24	As expected *
1N SFP pump trips	As expected
1 and 2 CD EDGs start	As expected
East ESW, CCW, Non-Essential Service Water and Motor Driven Auxiliary Feedwater pumps load shed (if running) on loss of Train A and sequenced onto EDGs.	As expected
Unit 1 and 2 East ESW headers de-pressurized and then re-pressurized.	As expected, then Safety valves 2-SV-14E and 1SV-15E on ESW header lift
ESW header pressure decreases below SRV setpoint	2-SV-14E and 1-SV-15E fail to fully reseal

NOTE: \*Under-frequency relays incorporate a low voltage cut-out feature which is set at 50% bus voltage to prevent spurious RCP trips. Actuation of this trip is dependent upon the rate of voltage decay versus frequency decay. In this case, bus voltage did not decay fast enough to enable this feature.

The trip of the SFP cooling pump resulted in a 1 degree F temperature rise of the bulk temperature of the SFP. This did not impact the safety of the fuel stored there.

RCS temperature at the time of the event was 335 degrees Fahrenheit (F), and cooled to approximately 315 degrees F while the RCS was in natural circulation. This had no impact on the safety of the plant.

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Donald C. Cook Nuclear Plant Unit 2

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

The responses of the equipment and plant were evaluated for safety significance. All actions expected to occur upon a loss of power to a single bus occurred, including load shed, start of the CD EDGs and sequencing of loads onto the EDGs. The safety significance of this event was minimal.

**Corrective Actions**

Reserve power was restored, and the 2 CD EDG was secured at 1134 hours, at which time Unit 2 exited the loss of offsite power procedure. The 1 CD EDG was secured and Unit 1 exited the loss of offsite power procedure at 1220 hours.

The surveillance required by TS 3.8.1.1 Action Statement was satisfactorily completed at 1218 hours the same day.

The ESW safety valve on the Unit 2 CTS heat exchanger has been replaced. Unit 1 is currently defueled and the Unit 1 ESW system is not required to be operable. The Unit 1 valve will be worked prior to Mode 4, during unit restart activities.

An inspection was performed of 18 similar safety valves on both units to ensure that the installation of the undersized gasket was not a common mode failure. The inspection determined that the problem was isolated to the single affected Unit 2 ESW safety valve.

The Interface Agreement between CNP and AEP Western Transmission Region will be revised by September 6, 2000, to require concurrent verification of switching operations in the switchyard by operations department personnel. The operations department will ensure, through a Standing Order, that concurrent verification is provided until the revision is implemented.

Training will be developed for the operators by September 29, 2000, to reinforce the expectations regarding 1-hour TS Action Statement requirements.

**Previous Similar Events**

315/99-028-00, "ESF Actuation and Start of Emergency Diesel Generator 1CD During Transformer Maintenance". Trip of the sudden pressure relay during maintenance to replace fill oil and nitrogen cover gas. The cause of this event was inadequate ownership of the interface between CNP and AEP Western Region. To prevent recurrence, improvements were to be made to the interface agreement to clarify that CNP is responsible for job planning, equipment clearances and job performance oversight.