

OYSTER CREEK NUCLEAR GENERATING STATION
Forked River, New Jersey 08731

Licensee Event Report
Reportable Occurrence No. 50-219/77-17-3L

Report Date

August 26, 1977

Occurrence Date

July 28, 1977

Identification of Occurrence

Operation in a Degraded Mode as defined in Technical Specifications, when the power supply was lost to Core Spray Pumps connected to "C" Bus and to Standby Gas Treatment System I. This event is considered to be a reportable occurrence as defined in the Technical Specifications, paragraph 6.9.2.b.2.

Conditions Prior to Occurrence

Plant was shut down for annual refueling with the mode switch in the "refuel" position.

Description of Occurrence

At 1645 on Thursday, July 28, 1977, the "C" 4160-volt Bus lost power when breakers 1C and EC opened due to activation of relays 51N (neutral overcurrent) and 86-1C/HR (lockout). Power to Reactor Protection System I was reestablished by transferring power feed from the MG set to the transformer and the scram was reset. Tie breakers US1T, US2T, and US3T were closed to supply power to plant 480-volt power systems normally fed by the "C" bus.

At that time, electricians were called to investigate the cause of the trip. After extensive testing as listed under Corrective Action, no failed components or improperly set components could be found and thus, the cause for the bus trip is unknown at this time.

Since the tests conducted proved the integrity of the relays, the bus and cables, the switchgear and the associated equipment, the system was returned to normal service.

Apparent Cause of Occurrence

The cause of the incident is unknown at this time.
(SEE R.O. 7813 FOR CAUSE)

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Analysis of Occurrence

The isolation of "C" bus resulted in a loss of standby emergency power to bus "1C". In addition, the incident resulted in a temporary loss of one-half the safety systems associated with the emergency busses. Had a condition called for the operation of the safety systems, the redundant systems would have been

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available to operate. The redundant diesel generator was proven operable soon after the occurrence, and therefore, was available if a complete loss of outside power sources had occurred.

Appendix L to the FDSAR contains a probability analysis regarding the availability of standby cooling systems and includes an analysis of off-site power availability concurrent with a loss of coolant accident. The results indicated that the reliability of available power from off-site sources or from a self-contained unit (only one diesel generator was considered in the analysis) was quite high. Since the station is provided with two separate diesel generator units, having one unit out of service has no effect on the results of the analysis. In addition, the effects of single bus operation during a loss of coolant accident was analyzed in Amendment 32 to the FDSAR and the unit loading under this condition was found to be within the normal KVA rating of the diesel generator. Thus, there is no additional safety significance associated with this event beyond that already analyzed.

Corrective Action

Electrical Tests Performed

- (1) The three phases of the bus and diesel cables were meggered at 2500 volts DC with all "C" Bus breakers racked in and open:
 - Phase A - 700 Megohms
 - Phase B - 750 Megohms
 - Phase C - 700 Megohms
- (2) Breaker EC was closed and megger readings retaken to prove no damage or fault occurred on the 4160-volt bus tie. Readings similar to those above were found.
- (3) Each of the three unit substation transformers and feeder cables were meggered at 2500 volts DC. (These were the only loads on the bus at the time).
 - US1A1/1A1P Feeder Cables - 100 Megohms
 - US1A2/1A2P Feeder Cables - 100 Megohms
 - US1A3/1A3P Feeder Cables - 125 Megohms
- (4) Current transformers were inspected and continuity checks made on the primaries and secondaries. No problems were found.
- (5) All relay wiring was checked for continuity, broken or shorted wires, and for poor connections. None could be found.
- (6) Current was driven through each phase of the bus with an ammeter in the secondary to prove the ratio of the current transformers. The ratio found matched the transformer 400/1 ratio.

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- (7) Lightning arresters were meggered at 2500 volts DC with no indications found.
- (8) Relay Department verified the proper setpoint and operation of all relays involved and those which could have failed upstream of the bus. All relays were found in proper operating condition.
- (9) The current transformers were by-potted to further verify their condition.
- (10) All portions of the bus were physically inspected. No evidence could be found, indeed, the bus was in excellent condition.
- (11) All feeder cable compartments were also inspected with similar results.
- (12) The bus and cables were tested with an 8000-volt DC hypot and results were compared to previous tests. No damage or degradation was indicated.
- (13) All sections of the bus and loads were reenergized one at a time to verify they would support normal operating voltage. All loads were taken without incident.
- (14) All relays and cabinet doors were shaken vigorously to "try" to trip relays inadvertently. The relays could not be tripped in this manner.

The PORC recommended the continued review of testing performed to search for any possible causes for the incident. Contact is being made with General Electric to determine any other means of proving the integrity of the lightning arresters.

Failure Data

No failed components were found.

SEE R.O. # 78/3 FOR CAUSE AS FOUND
DURING SUBSEQUENT FAULT.

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RESPONSE TO ENCLOSURE QUESTIONS
REPORTABLE OCCURRENCE 50-219/77-17

Section A of Enclosure Questions is pertinent since this event involved only one Startup Transformer.

RESPONSE:

- A.1 Two circuits are available; one circuit was lost.
- A.2 Cause of event was discovered subsequently during investigation of RO 78/3 (Attachment V). Cause was degradation of 5KV cable bus.
- A.3 Degradation of cable had advanced to more discharge prone condition in one bus than the other.
- A.4 No voltage excursions are pertinent to this event.
- A.5 No frequency excursions are pertinent to this event.
- A.6 The bus was out of service for a period of two to three hours while testing was performed to determine cause of event and ensure the bus was not faulted.
- A.7 DATE OF EVENT: 7/28/77