

LICENSEE EVENT REPORT (LER)

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| FACILITY NAME (1) Oyster Creek, Unit 1 | DOCKET NUMBER (2) 0 5 0 0 0 2 1 1 9 1 | PAGE (3) 1 OF 016 |
|---|--|----------------------|

TITLE (4)
Diesel Auto Start Due to 4160 Volt Bus Lockout (Elec. Fault)

| 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 | 9 | 2 | 5 | 8 | 4 | 8 | 4 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 3 | 0 | 8 | 4 | 0 | 5 | 0 | 0 | 0 |

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)

| | | | | | |
|-----------------------------|-------------------|------------------|-------------------------------------|---------------------|--|
| OPERATING MODE (9) N | 20.402(b) | 20.408(a) | <input checked="" type="checkbox"/> | 90.73(a)(2)(iv) | 73.71(b) |
| POWER LEVEL (10) 0 1 0 0 | 20.408(a)(1)(i) | 90.38(a)(1) | | 90.73(a)(2)(v) | 73.71(a) |
| | 20.408(a)(1)(ii) | 90.38(a)(2) | | 90.73(a)(2)(vi) | OTHER (Specify in Abstract below and in Text, NRC Form 388A) |
| | 20.408(a)(1)(iii) | 90.73(a)(2)(i) | | 90.73(a)(2)(vii)(A) | |
| | 20.408(a)(1)(iv) | 90.73(a)(2)(ii) | | 90.73(a)(2)(vii)(B) | |
| | 20.408(a)(1)(v) | 90.73(a)(2)(iii) | | 90.73(a)(2)(ix) | |

LICENSEE CONTACT FOR THIS LER (12)

| | |
|---|---|
| NAME David W. Jones, Electrical Engineer | TELEPHONE NUMBER AREA CODE: 6 1 0 9 9 7 1 1 - 4 8 8 8 |
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPROS | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPROS |
|-------|--------|-----------|--------------|---------------------|-------|--------|-----------|--------------|---------------------|
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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 fifteen single-space typewritten lines) (16)

While testing 1-2 Emergency Service Water Pump during Maintenance activities, personnel safety grounds were left on three (3) phases of the 4160 volt switchgear (motor load side of breaker). Tags were released to allow a jog of the motor to check for rotation. A bolted fault occurred when the control switch was closed causing a trip of the pump and a flash which caused sufficient ground current flow to trip the main 4160 volt bus "1C" breaker. During the refueling outage, at the time of the occurrence, the redundant 4160 volt bus "1D" was powered by the "1C" bus via cross tie breakers EC and ED. As a result of the lockout of the 4160 volt bus "1C" in this alignment normal offsite power was also lost to 4160 volt bus "1D". The loss of power to bus "1D" initiated an emergency fast start of Diesel Generator No. 2 to assume loads on bus "1D". The bus "1C" lockout prevented Diesel Generator No. 1 fast start until the operator reset the bus lockout at which time Diesel Generator No. 1 fast started to assume loads on bus "1C". After assessment of conditions, normal power source alignment was reestablished with two offsite power connections and two available diesel generators.

An investigation revealed that personnel safety grounds applied to Emergency Service Water Pump 1-2 motor feeder had not been removed by maintenance personnel prior to releasing tags to operate the pump.

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TEXT (If more space is required, use additional NRC Form 388A's) (17)

Date of Occurrence

The event occurred on September 25, 1984 at 2020 hours.

Identification of Occurrence

An unplanned automatic actuation of Diesel Generator No.2 due to loss of power on 4160 volt bus 1D reportable in accordance with 10 CFR 73(a)(2)(iv).

Conditions Prior to Occurrence

The reactor was refueled with the mode switch in REFUEL.

Description of Occurrence

On September 25, 1984 at 8:20 P.M., outage maintenance activities for the Emergency Service Water System pumps and motors was near completion. A request had been initiated by the maintenance contractor to temporarily lift equipment control tags for the Emergency Service Water (ESW) Pump Motors 1-1 and 1-2 in order to jog the motor as a check for motor rotation. ESW Motor 1-1 breaker was found not able to close. The breaker racking switch for the 1-1 ESW breaker needed adjustment to allow breaker closure. The operator proceeded to ESW 1-2 motor breaker, racked in the breaker, released control power tags, observed maintenance personnel were at the motor to observe rotation and contacted the control room operator to jog 1-2 ESW pump from the control room. As the control switch was closed, an immediate fault in ESW 1-2 4160 volt cubicle occurred.

Conditions Prior to Occurrence

1. Offsite power was aligned to 4160 volt bus 1A (via SIA) and to 4160 volt bus 1B (via SIB).
2. 4160 volt bus 1C was powered from bus 1A (via breaker 1C).
3. 4160 volt bus 1D was powered from bus 1C by bus tie breakers EC and ED.

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TEXT (If more space is required, use additional NRC Form 368A's) (17)

4. The normal bus 1D feeder breaker, breaker 1D, was open to allow protective relay maintenance checks by the Relay Department.

5. 125 volt DC Battery "C" was being recharged following previous load discharge test. The "C" battery breaker was open and the "C" battery charger was powering DC loads (including 4160 volt bus 1A and 1C control power).

Due to the occurrence, the following occurred:

1. ESW 1-2 tripped due to phase overcurrent and ground current.
2. Main breaker 1C tripped due to ground overcurrent causing 4160 volt bus 1C 86 lockout relay trip.
3. Tie Breaker EC cleared due to 1C lockout.
4. Diesel Generator No. 1 blocked from starting due to bus 1C lockout.
5. The trip of breaker EC caused loss of bus tie power to 4160 volt bus 1D and initiated Diesel Generator No. 2 fast start to assume loads on 4160 volt bus 1D.
6. The 125 volt DC "C" battery charger output breaker tripped due to overcurrent.

Note: Both RPS systems de-energized due to loss of power resulting in a full scram and initiation of Standby Gas Treatment System No. 2.

After assessment of conditions, clearing of smoke haze from the 4160 Room bus 1C vault and racking out the 1-2 ESW breaker, bus 1C 86 lockout was reset allowing fast start of Diesel Generator No. 1 to assume loads on the 1C 4160 volt bus at approximately 9:16 PM. The "C" battery charger breaker was reset restoring DC control power to 4160 volt bus 1A and 1C. Normal offsite power alignment was restored to the 1C bus by resynchronizing bus 1A to the diesel powered bus 1C and securing Diesel Generator No. 1. Tags were released on breaker 1D (normal feed to 4160 volt bus 1D) and normal offsite power was restored to the 1D 4160 volt bus by resynchronizing bus 1B to the diesel powered bus 1D and securing Diesel Generator No. 2.

In accordance with Oyster Creek procedure 126, the NRC was notified of the loss of power to safety related and security systems.

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

Apparent Cause of Occurrence

Electricians removed the rear cable access panel of the ESW 1-2 compartment (panel metal was stretched and bulged). The personnel safety grounds had not been removed prior to closure of the rear cable compartment when maintenance was complete on the motor feeder cables. Extensive flash in the cubicle had vaporized portions of the load side aluminum bus links to motor current transformers, flashed the load side porcelain bushings, flashed outer tape layers of the motor feeder cables and deposited carbon products throughout the cubicle. The main bus had been protected by sheet metal baffles and thus displayed extremely minor carbon dust deposits on outer insulation.

A critique was conducted the following morning with maintenance, contract maintenance, operations and management personnel to determine events leading to the lack of personnel safety ground removal. The following facts are relevant:

1. Contract Electrical Job Supervisor requested equipment control tags for four (4) ESW pumps on August 26, 1984 to perform maintenance on motor feeder circuits and conduit at the intake canal.
2. Contract supervisor also requested personnel safety grounds for each circuit in accordance with Oyster Creek procedure 108, "Equipment Control". The operator included a comment on the tagging request, "Insure ground straps are removed from load side of breaker", before removing tag.

Note: Personnel safety grounds are placed and removed by maintenance personnel.

3. The contract Electrical Job Supervisor requested Plant Electricians to place grounds as required and work proceeded.
4. Approximately two (2) weeks prior to the event, the contract Electrical Supervisor left the site and was replaced on the job by a new contract Electrical Job Supervisor.

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

5. On three (3) circuits (ESW 1-1, 1-3, 1-4) grounds were removed from the cable terminations with the supervisors knowledge when cables were being retaped. These grounds were not relocated or reinstalled when taping procedures were completed and rear access covers were closed.
6. Grounds for ESW 1-2 feeder circuit had originally been placed on the load side bus links, not on cable terminations and thus did not interfere with cable retaping procedures.
7. On completion of taping ESW 1-2 motor leads, the rear cover was replaced with grounds remaining on ESW 1-2 load side bus links.
8. On September 25, 1984, the supervisor submitted a temporary tag lift to the Operations department to allow a jog of the motor to check rotation. The temporary lift form did not specify that grounds needed to be removed and the Plant Electrical Department had not been previously notified by the Job Supervisor to remove grounds. During the critique, the contract job supervisor indicated that although he knew grounds were on, he assumed the Group Shift Supervisor would notify the Plant Electricians to remove the grounds.

The cause of the occurrence was improper turnover of work responsibility from one Job Supervisor to the next and inadequate attention to electrical safety rules regarding interactions with equipment control procedures.

Analysis of Occurrence and Safety Assessment

The reactor was fueled and the reactor mode switch was in the REFUEL position. Primary containment was not required. The Core Spray System was in reduced availability configuration permitted in accordance with Technical Specifications. Offsite power was supplied through one of two available circuits. Each of two safety related 4160 volt buses had operable Emergency Diesel Generators available. Although the 1C 4160 volt bus was locked out by relay actuation damage was not incurred as a result of a load fault on the bus and was, therefore, available through manual action to be powered from diesel generators or from the offsite power system.

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Plant conditions at the time of the occurrence required at least one Core Spray and Standby Gas Treatment system to be operable. The loss of one automatic Emergency Diesel Generator and loss of offsite power to both redundant systems would not have prevented operation of Engineered Safety Systems if they had been required. Further, there were additional power options available through operator intervention to restore disconnected power sources. As such, the impact on plant safety is considered minimal.

Corrective Action

The immediate corrective action was to restore both offsite power sources and Diesel Generators to their normal service configurations. The 4160 volt bus 1C was subsequently removed from service for thorough inspection and high voltage dielectric testing to assure integrity.

Repair activities commenced to restore the ESW 1-2 feeder compartment to proper operating condition. Damaged bus links and porcelain insulators were replaced. All other compartment equipment was cleaned, tested and reinstalled. All protective relays involved were retested to assure reliability. The 4160 volt breaker which interrupted fault current was sent to the General Electric Service shop for inspection and parts replacements (some contracts and insulation barriers experienced minor interruption arc damage). The motor and feeder cables were hypotted and found in good condition. One fire damper which failed to close when a fire alarm sounded (due to smoke in room) was repaired and returned to service.

Disciplinary actions were taken with respect to the contract supervisor involved with the occurrence.

Subsequent discussions with plant personnel regarding procedural controls, determined a mechanism by which personnel safety grounds will be more effectively controlled. The requirement to include personnel safety grounds under a separate breaker tag has been ordered. Existing procedural controls now require all tags to be cleared prior to rack in and closure of any breaker thus requiring ground removal.



GPU Nuclear Corporation
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Forked River, New Jersey 08731-0388
609 971-4000
Writer's Direct Dial Number:

October 30, 1984

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

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Licensee Event Report

This letter forwards one (1) copy of Licensee Event Report (LER)
No. 84-021.

Very truly yours,

Peter B. Fiedler
Vice President and Director
Oyster Creek

PBF:dam
Enclosures

cc: Dr. Thomas E. Murley, Administrator
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

NRC Resident Inspector
Oyster Creek Nuclear Generating Station
Forked River, NJ 08731

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