

James A. FitzPatrick
Nuclear Power Plant
P.O. Box 41
Lycoming, New York 13093
315 342-3840



Harry P. Salmon, Jr.
Resident Manager

June 4, 1992
JAFP-92-0437

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, DC 20555

SUBJECT: Docket No. 50-333
Licensee Event Report: 92-024-00 - Emergency
Diesel Generators Declared
Inoperative Due to
Unanalyzed Condition

Dear Sir:

This letter is submitted in accordance with 10CFR50.73
(a)(2)(ii)(A).

If you have any questions, please contact Mr. W. Verne
Childs at (315)349-6071.

Very truly yours,

HARRY P. SALMON, JR.

wvc
HPS/WVC/DLD/mam

Enclosure

CC: USNRC, Region I
USNRC Resident Inspector
INPO Records Center

*Cert #
P 064 705 479*

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9206120132 920604
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S PDR

JFP

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20585, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

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TITLE (4)
Emergency Diesel Generators Declared Inoperative Due to Unanalyzed Condition

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)																																																									
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LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
W. Verne Childs, Senior Licensing Engineer	3 1 5 3 4 9 - 6 0 7 1

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS

SUPPLEMENTAL REPORT EXPECTED (14)

<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)
		0 9 0 1 9 2

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

INTERIM REPORT

EIIS Codes are in []

The plant was shutdown and in the cold condition for maintenance and refuel. As a result of an observed Emergency Diesel Generator [EK] load excursion, an analysis of the Emergency Diesel Generators (EDGs) electrical circuitry was performed and indicated a potential for engine governor offset in the event of a battery ground. Testing performed on April 14, 1992 confirmed that introduction of a ground resulted in EDG load and frequency shifts. The results from the testing were sent to Engineering for review and analysis. Following review of the test information, Engineering determined that a potential for an unanalyzed condition exists. Engineering notified Plant Management on May 6, 1992 and the Emergency Diesel Generators were declared inoperative, and the NRC notified. Additional operability tests will be performed and required corrective action for the EDGs will be completed prior to declaring the diesels operable.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530) U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TEXT (if more specified, use additional NRC Form 366A's) (17)

INTERNAL REPORT

EIIS Codes are in []

Event Description

During a test of the B & D Emergency Diesel Generators (EDGs) [EK] operating in parallel with offsite power in July of 1990, Control Room Operators observed EDG load excursions which were concurrent with the presence of grounds on the 125VDC station battery bus [EJ]. Instrument & Control was contacted to troubleshoot the problem. The ground on the battery bus detected in the control room was traced back to a ground on the actuator for the High Pressure Coolant Injection (HPCI) [BJ] turbine. The ground problem for the HPCI actuator was corrected, and no further diesel generator problems were detected. Work requests have been written to check for grounds associated with station batteries since 1991. FitzPatrick uses the station batteries as its DC power supply to supply the EDG governors. Due to this configuration a ground on the DC bus has the potential to adversely affect the performance of the EDG governor.

During an evaluation of the electrical circuit created by this configuration, it was found to be theoretically possible, assuming grounds on the battery, to produce EDG governor offsets with the attendant load and frequency offsets. This type of problem would be difficult to detect due to the self-correcting features of the governor. Based on the concern identified by this analysis, a test plan was developed to provide confirmation of the existence (or non-existence) of the theorized problem. I&C performed the test/troubleshooting procedure on April 14, 1992.

The test results were sent to Engineering for review. The results of the test confirmed the circuit evaluation on the effects of grounds on the battery bus. That is, the test confirmed that frequency or load swings could occur given a ground on the 125 VDC bus. Engineering contacted the manufacturer of the EDG speed controller, Woodward Governor Company, to discuss the problem. Woodward stated that the controller is susceptible to grounds on the DC supply. A ground could cause the DC input voltage to the controller to oscillate. However, Woodward knew of no other industry experience similar to the ones at FitzPatrick. Woodward believes that the problem is not related to the controller, but to the DC power supply. Engineering also performed an industry search on this type of grounding concern or speed controller problem, and found no other plants with similar experiences.

Based on their review, Engineering notified plant management on May 6, 1992, that this was a potential unanalyzed condition. All EDGs were declared inoperative on May 6, 1992 and the NRC notified per the requirements of 10CFR50.72(b)(2). The FitzPatrick plant is currently in a refueling outage. In addition, all irradiated fuel is in the

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

spent fuel pool and no handling of fuel or other activities involving potential damage to irradiated fuel are taking place. Per Technical Specifications the EDGs are not required to be operable under these conditions. Since determination of an unanalyzed condition, the plant has remained in a refueling outage and the EDGs remain in an inoperative status.

Cause

The cause will be reported in an update to this LER. The apparent cause is a weakness in the original plant design.

Analysis

The Emergency Diesel Generators are designed to provide backup power to the plant in the event of loss of offsite power. The EDGs are not used for normal operation and are not required per Technical Specifications with no fuel in vessel, and no activities involving the handling of irradiated fuel are taking place. Periodic testing and surveillance is performed to assure readiness and operability of the EDGs.

The concern expressed has identified a potential design weakness. At this time, it can be confirmed that the control system does respond to a ground. Operation of the EDGs per FSAR design basis conditions (that is, isolated from offsite power) needs to be analyzed and verified to determine if the grounding affects operation when isolated from offsite power. The potential unanalyzed condition is considered to require a report under 10CFR50.73(a)(2)(ii)(A).

The concerns for this postulated condition are 1) the ability of the EDGs to maintain the required frequency under all required load conditions, and 2) stability of the EDG output frequency or load. Potential effects of these problems would be 1) damage to loads (motors) due to insufficient frequency, and 2) the possibility of inducing generator oscillations.

Testing will be performed to quantify the impact grounds would have on the EDG governor. This involves determining the bounding conditions of a worst case scenario. The worst case scenario would provide a basis for design modifications to make the system tolerant if a postulated ground should occur.

At this time there is no data to know conclusively the actual effect of grounds on the EDG system.

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TEXT (If more space is required, use additional NRC Form 365A's) (17)

Corrective Action

Resolution of the identified concerns involve the following actions:

1. Prepare and perform a special test to determine the operability of the EDGs, and generate data on the effects of grounds on the system. To be completed prior to moving fuel from the spent fuel pool.
2. Depending on the results of the special test, prepare and implement corrective action. This will be completed prior to declaring the EDGs operable.
3. The RCIC and HPCI turbines also have speed control governor designs similar to the EDGs. Resolution of the EDG issue will determine the actions taken in regards to these components. Due date to be included in final report.

These actions will provide the basis for ensuring that the EDG configuration is operating within analyzed parameters. Results of the special test will be provided in the final LER.

Additional Information

Failed Components: None

Previously Similar Events: No previous LERs identified similar to the grounding concern discussed in this LER.