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FACIL:50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylva 05000387
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RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 96-004-00 on 960704,improper circuit breaker alignment discovered rendering. EDG inoperable. Caused by error of non-licensed operator on 960614. Proper alignments completed & operability testing of EDG completed. W/960802 ltr.

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TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: 05000387

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AUG 2 1996

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SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 50-387/96-004-00
PLAS - 671 FILE R41-2

Docket No. 50-387
License No. NPF-14

Attached is Licensee Event Report 96-004-00. This report is being made pursuant to 10CFR50.73(a)(2)(i)(B) as a condition prohibited by the plant's Technical Specifications in that the 'E' Emergency Diesel Generator (EDG) was rendered inoperable on June 14, 1996 due to a circuit breaker mis-alignment and, as a result of not being discovered until July 4, 1996, the Technical Specification Limiting Condition for Operation ACTION time of 72 hours was exceeded. Also, as a result of the 'A' and 'C' EDGs being inoperable for 1 minute (6/24/96) and 2 minutes (7/1/96), respectively, for voltage regulator bridge transfers, less than three EDGs were OPERABLE during these short durations. As such, this event is also reportable per 10CFR50.73(a)(2)(v) as an event which alone could have prevented fulfillment of the safety function of structures or systems needed to shut down the reactor and maintain it in safe shutdown, remove residual heat, control the release of radioactive material or mitigate the consequences of an accident.

G. J. Kuczynski
Plant Manager - Susquehanna SES

Attachment

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IE22

NRC FORM 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92
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), U7.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER(2)	PAGE (3)
Susquehanna Steam Electric Station - Unit 1	0 5 0 0 0 3 8 7	1 OF 1 2

TITLE (4)
Condition Prohibited By The Plant's Technical Specifications - Circuit Breaker Mis-Alignment Resulted In Emergency Diesel Generator Inoperability

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 7	0 4	9 6	9 6	0 0 4	0 0	0 8	0 2	9 6	SSES - Unit 2	0 5 0 0 0 3 8 8
										0 5 0 0 0

OPERATING MODE (9)	1
POWER LEVEL (10)	1 0 0

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

	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
	20.405(a)(1)(i)		50.36(c)(1)	X	50.73(a)(2)(v)		73.71(c)
	20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		
	20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		
	20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

(LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Richard R. Wehry - Nuclear Licensing Engineer	AREA CODE 7 1 7 5 4 2 - 3 6 6 4

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

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

At 1630 hours on July 4, 1996, with Unit 1 and Unit 2 both in Condition 1 (Power Operation) at 100% power, a non-licensed operator performing station rounds discovered an improper circuit breaker alignment which rendered the 'E' Emergency Diesel Generator (EDG), which was substituting for the 'D' EDG, inoperable. An immediate assessment was performed, breaker alignment was corrected and 'E' EDG OPERABILITY testing was satisfactorily completed. Investigation determined that the mis-alignment was performed by another non-licensed operator on 6/14/96 and that three subsequent electrical line-up surveillances performed by three additional non-licensed operators failed to identify the mis-alignment. During the time that 'E' EDG was determined to have been inoperable, two short duration (1 minute and 2 minute) LCOs were taken during voltage regulator bridge transfers on the 'A' and 'C' EDGs. As such, less than three EDGs were OPERABLE for those short durations and a report per 10CFR50.72(b)(2)(iii) was made at 1026 hours on 7/5/96. The primary causes for this event were deficiencies in the performance of some non-licensed operators and the failure of Management to detect and correct those deficiencies. An Engineering Safety Assessment concluded that the 'E' EDG, although degraded as a result of the mis-alignment, would have started and performed all safety functions and would have operated for a period of time considered adequate to assure operator correction of the mis-alignment, ensuring continued 'E' EDG operation. Corrective actions include removal from shift responsibilities of non-licensed operators whose rounds performances were deficient pending final disposition; re-performance of subject Technical Specification related rounds by first line supervision; verification of key breaker/component proper configuration; counseling of involved Operations supervision concerning taking prompt action when status control is questioned; increased management oversight and monitoring of non-licensed operator performance; procedural enhancements and review of event and findings with Nuclear Department personnel

EVENT DESCRIPTION

At 1630 hours on July 4, 1996, with Unit 1 and Unit 2 both in Condition 1 (Power Operation) at 100% power, an operator (utility; non-licensed) performing station rounds discovered an improper circuit breaker alignment which rendered the 'E' Emergency Diesel Generator (EDG; EIIS Code: EK) inoperable. Upon confirmation of the mis-alignment, an immediate assessment of the situation was performed, proper breaker alignments were completed and OPERABILITY testing of the 'E' EDG was satisfactorily completed. Investigation determined that the improper circuit breaker alignment occurred on June 14, 1996 when the 'E' EDG was substituted for the 'D' EDG, which was out of service for planned maintenance activities. The 'E' EDG is a fifth and spare EDG which can be substituted for any one of the four EDGs ('A', 'B', 'C' or 'D') at Susquehanna.

Additionally, review of the station Limiting Condition for Operation (LCO) logs determined that during the time periods of 6/24/96 from 0455 - 0456 (1 minute duration) and 7/1/96 from 0455 - 0457 (2 minute duration), the 'A' EDG and 'C' EDG, respectively, were inoperable for those short durations during voltage regulator bridge transfers. As such, during those short durations and, given 'E' EDG inoperability, less than three EDGs were OPERABLE. A report pursuant to 10CFR50.72(b)(2)(iii) was made at 1026 hours on 7/5/96.

The improper circuit breaker alignment occurred when another operator (utility; non-licensed), on June 14, 1996, mistakenly removed 4160 volt circuit breaker number 0A51005 from 4160 volt distribution bus 0A510 cubicle position 6 vice circuit breaker number 0A51006 from 0A510 cubicle position 1 and placed it in cubicle position 7 in order to substitute the 'E' EDG for the 'D' EDG.

4160 volt bus 0A510 is located in the 'E' EDG building and contains 8 distinct and separate cubicles. Cubicle position 4 is a spare cubicle and cubicle position 8 houses potential transformer equipment. Cubicle position 6 houses circuit breaker number 0A51005, which automatically closes in the event of a total loss of offsite power (LOOP) to energize 480 volt Motor Control Center (MCC) 0B565. MCC 0B565, which, except during a LOOP, is energized via the normal plant electrical distribution system, provides power to the non engine-driven 'E' EDG auxiliary equipment, the 'E' EDG Class 1E 125 VDC battery charger and equipment associated with the habitability of the 'E' EDG building. Thus, circuit breaker number 0A51005 must always be installed in cubicle position 6, regardless of 'E' EDG alignment configuration. The remaining five cubicle positions are utilized for the transition/substitution circuit breaker which can be installed in the appropriate cubicle (2, 5, 3 or 7) when the 'E' EDG is substituted for EDG 'A', 'B', 'C' or 'D', respectively; or installed in cubicle position 1 to connect 'E' EDG to its test facility for testing purposes when not aligned for one of the other four EDGs.

Three subsequent performances of a weekly electrical line-up surveillance by three different operators (utility; non-licensed) failed to identify the 'E' EDG circuit breaker mis-alignment.

CAUSE OF EVENT

A root cause analysis of this event was performed by a multi-disciplined Event Review Team. Additionally, separate, independent investigations and reviews were performed by PP&L's Nuclear Assessment Services and by PP&L's Corporate Auditing Services.

The primary causes of this event can be summarized under two key issue areas as follows:

Key Issue #1

Deficiencies existed in the performance of some non-licensed operators.

Key Issue #2

Management failed to detect and correct operator performance deficiencies.

Concerning Key Issue #1, above, the following specific causes were identified:

1. The performance of the non-licensed operator during substitution of the 'E' EDG for the 'D' EDG on 6/14/96 was less than adequate. This resulted in the breaker mis-alignment.

2. The performance of three non-licensed operators, who performed weekly electrical line-up surveillances and failed to identify the 'E' EDG mis-alignment, was unacceptable.

3. The quality of operator rounds performed by an additional eight (8) (one licensed and seven non-licensed) operators was less than adequate.

4. The knowledge level of the 'E' EDG electrical function and operations among Operations personnel is less than adequate.

Concerning Key Issue #2, above, the following specific causes were identified:

1. Operations Shift Supervision (utility; licensed) erred in not verifying proper circuit breaker alignment on 6/14/96 when the non-licensed operator raised questions concerning what he thought was a breaker mis-alignment (original alignment was correct; action taken by the non-licensed operator resulted in the mis-alignment).

2. Operations Shift Supervision erred in not promptly investigating the apparent status control event (apparent mis-alignment) as reported, albeit in error, by the non-licensed operator on 6/14/96.

3. Operations Shift Supervision failed to identify the inadequacy of operator rounds performance by some non-licensed operators.

A causal factor that contributed to this event was:

Operability surveillance testing of the 'E' EDG when substituted for another EDG did not verify status of breaker 0A51005, which is designed to automatically close and energize the 480 volt MCC for 'E' EDG auxiliary equipment in the event of a LOOP.

REPORTABILITY/ANALYSIS

This event was determined to be reportable per 10CFR50.73(a)(2)(i)(B) as a condition prohibited by the plant's Technical Specifications in that the 'E' EDG was rendered inoperable on June 14, 1996 and, as a result of not being discovered until July 4, 1996, the required ACTION time of Technical Specification LCO ACTION 3.8.1.1.b.3 (72 hours) was exceeded. Also, as a result of the 'A' EDG and 'C' EDG being inoperable for 1 minute (6/24/96) and 2 minutes (7/1/96), respectively, for voltage regulator bridge transfers, less than 3 EDGs were OPERABLE during these short durations. The Susquehanna Final Safety Analysis Report (FSAR) requires three OPERABLE EDGs to safely shutdown the plant. As such, this event was also determined to be reportable per 10CFR50.73(a)(2)(v) as an event which alone could have prevented fulfillment of the safety function of structures or systems needed to shutdown the reactor and maintain it in safe shutdown, remove residual heat, control the release of radioactive material or mitigate the consequences of an accident.

The nature and extent of the degradation of this safety system was, in the event of a LOOP, Class 1E MCC 0B565 would not have been automatically energized to support long term operation of the 'E' EDG when aligned to the Class 1E Distribution System.

When connected to the Class 1E Distribution System, the 'E' EDG fully replaces the out of service EDG for all safety related functions. Class 1E MCC 0B565 supports the long term operability of the 'E' EDG by providing AC power to the following equipment:

- Non-engine driven auxiliaries
- 'E' EDG Class 1E 125 VDC Battery Charger
- Equipment associated with the habitability of the 'E' EDG Building

The equipment of specific interest during a loss of AC power includes; 'E' EDG fuel oil transfer pump, various ventilation fans that support habitability of the 'E' EDG Building and Class 1E Battery Charger 0D596, all of which will lose AC power when Class 1E MCC 0B565 is deenergized.

The postulated failure being evaluated is loss of Class 1E MCC 0B565 under Loss of Coolant Accident (LOCA) with LOOP conditions with the 'E' EDG connected to the Class 1E Distribution system based upon circuit breaker 0A51005 found NOT installed.

Engineering's review revealed that there are no consequential failures that result from this event nor are there any common mode considerations for impact on the other EDGs.

There are three conditions that are considered limiting cases for the failure of Class 1E MCC 0B565 to support the LOOP operation of the 'E' EDG aligned to the Class 1E Distribution System; they are as follows:

- Limiting Case #1 - 'E' EDG run time to fuel oil day tank empty.
- Limiting Case #2 - 'E' EDG run time for local temperature rise to cause undesired effects on critical equipment assuming loss of all ventilation.
- Limiting Case #3 - 'E' EDG run time for depletion of the 'E' EDG Class 1E Battery below minimum required voltage.

The worst case postulated time for the loss of fuel oil to affect the 'E' EDG performance under LOCA/LOOP conditions with Class 1E MCC 0B565 deenergized, and the 'E' EDG aligned to the Class 1E distribution system was judged to be not less than 1 hour and 25 minutes. The rationale for this assumption is based upon Unit 1 requiring the highest LOCA load sequence followed by a delayed LOOP, coincident with the 'E' EDG fuel oil day tank level just above the transfer pump start setpoint. These conditions will result in the shortest operating time (i.e., not less than 1 hour and 25 minutes) for the 'E' EDG in the evaluated scenario.

The worst case postulated time for high room temperature to affect the 'E' EDG performance under LOCA/LOOP conditions with Class 1E MCC 0B565 deenergized and the 'E' EDG aligned to the Class 1E distribution system was judged to be not less than 45 minutes. For this assessment, air temperature rise in the 'E' EDG building is estimated to be 1°F per minute. This value is considered conservative based on operating experience and engineering judgment associated with the large volume of the 'E' EDG Building, estimated radiant heat rejected from the 'E' EDG in emergency mode, location of the sensitive equipment in comparison to 'E' EDG, stratification effects, building air leakage, conductive and convective heat transfer to building surfaces, etc.

The worst case postulated time for the loss of the 'E' EDG 125 VDC Class 1E Charger to affect the 'E' EDG performance under LOCA/LOOP conditions with Class 1E MCC 0B565 deenergized, and the 'E' EDG aligned to the Class 1E distribution system would be not less than 4 hours. Surveillance testing periodically demonstrates the 'E' EDG Class 1E battery is capable of supplying the design load profile for a minimum of 4 hours. The loads, included in the load profile for this battery, are; Emergency Service Water (EIIS Code: BI) Valves for the 'E' EDG Building, 'E' EDG Fuel Oil Booster Pump, and various 'E' EDG and Switchgear controls, indication and alarms.

In the event of a LOCA, Control Room operators anticipate the automatic start of all four EDGs. If any EDG related alarm is received in the Main Control Room, it is expected an operator would be dispatched to the corresponding EDG on a priority basis. Subsequent to the postulated LOCA, in accordance with operating procedures, in the event of a postulated LOOP, the first procedural action is to dispatch an operator to the EDGs. Based upon actual operating experience, it is reasonable to assume that it takes an operator less than 15 minutes to attend to any EDG alarm.

Additionally, it is reasonable to assume that the Main Control Room will direct the operator to the 'E' EDG Building to observe the cause for the additional annunciation pertaining to the 'E' EDG which would result from the LOOP and subsequent failure to automatically energize Class 1E MCC 0B565.

Upon initial approach to the 'E' EDG Building, the operator would be alerted to an abnormal condition via an audible alarm. Proceeding into the 'E' EDG Building, the operator would be confronted with the abnormal loss of general lighting since only emergency lighting would be available. Once the operator was in attendance at the 'E' EDG control panels, the operator would determine the reason for any local annunciators.

In the event Main Control Room personnel were not immediately focused on the annunciation related to the 'E' EDG at the time of the LOOP, approximately 9 minutes later, when the fuel at the 'E' EDG fuel oil day tank reaches approximately 50 inches, the "Fuel Oil Day Tank Level Low" alarm will annunciate at the local 'E' EDG Panel in the 'E' EDG Building and the Control Room "Low Priority Trouble" alarm for the EDG for which 'E' EDG is substituting will reflash.

It is reasonable to conclude that, with all of the alarms and indications available, operations personnel will be dispatched to the 'E' EDG Building promptly to perform routine observation of 'E' EDG running in emergency as a result of the LOOP signal or to determine the cause of the additional alarms specific to the 'E' EDG that were presented in the Main Control Room. Once identified, the remaining actions are those directly related to manipulating one 4160 volt breaker at 'E' EDG Switchgear bus 0A510 to reenergize Class 1E MCC 0B565.

The actual operator actions required to reenergize Class 1E MCC 0B565 are not considered complex. Identification of the missing breaker location is a simple check of 5 switchgear cubicles. Racking of a 4160 volt breaker is an individual operator activity, performed on a routine basis by operations personnel. The necessary tools and equipment are staged at the switchgear location. Training has been provided to accomplish the racking of the circuit breakers associated with the 'E' EDG. The normal time required to locate a breaker at the 0A510 Switchgear, remove it from its storage location, transfer and rack it into the connected position and close it locally in accordance with plant design, has been observed to take approximately 10 to 15 minutes.

It is engineering's judgment, that the 'E' EDG will operate and perform all of its intended safety functions for at least 45 minutes without operator intervention. Furthermore, based upon the arguments presented above, it is reasonable to conclude that sufficient time is available for an operator to attend to the 'E' EDG, assess the symptoms via written procedures, determine the corrective actions and perform the necessary nuclear safety related operator actions to reenergize Class 1E MCC 0B565 in approximately 30 minutes.

Once Class 1E MCC 0B565 is reenergized there are no further extraordinary operator actions required to support the restoration of ventilation to the 'E' EDG Building, normal automatic operation of the fuel oil transfer pump, or input power to the Class 1E 125VDC Battery charger. Operations personnel would monitor normal restoration and proceed to other work activities as required.

The expectation for successful operator action in lieu of automatic function for the reenergization of Class 1E MCC 0B565 is reasonable based upon the guidelines provided in ANSI/ANS 58.8-1984, "Time response design criteria for nuclear safety related actions." This standard provides a basis for the determination of whether nuclear safety related systems that mitigate the consequences of design basis events may be initiated or adjusted by use of operator action or automatic protection systems. The standard proposes

specific time criteria that must be met to take credit for operator action in lieu of automatic protective functions. Therefore, to bound the assertions related to the ability of an operator to successfully detect, assess, respond and correct the condition described, it is considered prudent to test the proposed operator actions, to the criteria presented in the standard. In conjunction with the proposed scenario, for locations outside the control room, nuclear safety related operator actions may be considered where certain criteria are met. The standard describes the minimum times for various task sequences and operator judgments. The minimum time suggested by the standard for actions required is 30 minutes from event indication, in this case the LOOP, until the time for completion of nuclear safety related operator action.

There are no radiological or environmental impediments to accomplishing the reenergization of Class 1E MCC 0B565 as described above and there are a sufficient number of qualified shift operators available to perform the required task.

It is engineering's judgment that there is reasonable assurance that sufficient time is available for successful manual operator action to preempt the loss of the 'E' EDG prior to high temperature affecting 'E' EDG performance under postulated LOCA/LOOP conditions with Class 1E MCC 0B565 deenergized and 'E' EDG aligned to the Class 1E Distribution system.

In conclusion, based on the above, it is engineering's judgment that there is reasonable assurance that the 'E' EDG, though degraded, would have started and performed all safety functions. Furthermore, 'E' EDG would have operated for a period of time considered adequate to assure successful operator intervention to transfer the 4160 volt circuit breaker from cubicle position 1 to cubicle position 6 and to manually close the circuit breaker, thereby reenergizing Class 1E MCC 0B565 and ensuring continued 'E' EDG operation.

With respect to less than three EDGs being OPERABLE during the time periods of 6/24/96 from 0455-0456 (1 minute duration) and 7/1/96 from 0455-0457 (2 minute duration) for bridge transfers, an operator, at the respective diesel generator local control panels, transferred the bridge circuits in accordance with plant procedures. This is a normal, routine evolution. The operator placed the EDG in the "Local" position, thereby rendering it inoperable, transferred the bridge circuit in accordance with plant procedures and returned the control switch to the "Remote" position, thereby restoring the EDG to OPERABLE, automatic standby status. In conjunction with the arguments presented above, the 'E' EDG, though degraded, was capable of starting and performing all safety functions for at least 45 minutes. This period of time is considered adequate to assure successful operator intervention to transfer the 4160 volt circuit breaker from cubicle position 1 to cubicle position 6 and to manually close the circuit breaker, thereby reenergizing Class 1E MCC 0B565 and ensuring continued 'E' EDG operation.

Final Safety Analysis Report (FSAR) Section 8.3.1.3 describes the Class 1E Power System at Susquehanna. The design of the system includes four 4160 volt buses per unit each with two offsite power sources designated as preferred and alternate supplies. EDGs are provided as standby power supplies in the event of a total loss of the preferred and alternate offsite power supplies. FSAR Section 8.3.1.11.1 further describes the capability of the Class 1E system. Specifically the onsite power system includes four load groups. The load groups are redundant in that any three of the four load groups are capable of assuring:

1. Specified acceptable fuel design limits and design conditions of the reactor pressure coolant boundary are not exceeded as a result of anticipated operational occurrences.

2. The core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

The design includes the assumption of an accident in one unit and the orderly shutdown and cooldown of the other unit. In summary, the loss of one EDG is bounded by the plant design.

Based on the above Engineering Safety Assessment, it is concluded that there were no safety consequences or compromises to public health and safety as a result of this event.

In accordance with guidance provided in NUREG 1022, Supplement 1, item 14.1 and 10CFR50.4(d), the required submission date for this report was determined to be August 5, 1996.

CORRECTIVE ACTIONS

Upon confirmation of the 'E' EDG circuit breaker mis-alignment, an immediate assessment of the situation was performed, proper breaker alignments were completed and OPERABILITY testing of the 'E' EDG was satisfactorily completed.

A review of the station LCO logs was performed and determined that during the time periods of 6/24/96 from 0455-0456 (1 minute duration) and 7/1/96 from 0455-0457 (2 minute duration), the 'A' EDG and 'C' EDG, respectively, were inoperable for those short durations during voltage regulator bridge transfers. As such, during those short durations, and, given 'E' EDG inoperability, less than three EDGs were OPERABLE. A report pursuant to 10CFR50.72(b)(2)(iii) was made at 1026 hours on 7/5/96.

A root cause analysis of this event was performed by a multi-disciplined Event Review Team. Additionally, separate, independent investigations and reviews were performed by PP&L's Nuclear Assessment Services and by PP&L's Corporate Auditing Services.

Corrective actions with respect to Key Issue #1, "deficiencies existed in the performance of some non-licensed operators" are as follows:

- The four non-licensed operators directly involved with this event were removed from shift responsibilities until investigation was completed and until appropriate disposition for each is determined.
- All 'E' EDG transfers are now supervised by Operations first line supervision.
- All Technical Specification related operator rounds, including the Weekly Electrical Distribution Verification were completed by Operations first line supervision.
- Shift Supervision now performs rounds with non-licensed operators on a random basis on each shift.
- The event was reviewed with all Operations personnel with emphasis on rounds, records and notification of supervision.
- Provide instruction, including on-the-job training, to all Operations personnel on the electrical functions and operation of the 'E' EDG.
- An investigation of the surveillance issue (failure of three non-licensed operators to identify the 'E' EDG mis-alignment) was completed by independent personnel skilled in malfeasance type work. It was concluded that no tampering with plant equipment occurred.
- A detailed check was completed to ensure that the major circuit breakers and other key components were in the proper configuration.
- An additional eight operators (one licensed and seven non-licensed) identified as having less than adequate rounds performance as a result of the investigation were removed from shift responsibilities until the investigation was completed and until appropriate disposition for each is determined.
- A daily EDG round by appropriate management personnel was added.

Corrective actions with respect to Key Issue #2, "Management failed to detect and correct operator performance deficiencies" are as follows:

- Operations Manager conducted meeting with Shift Supervision personnel to communicate expectations and responsibilities.
- Results of the event investigation was reviewed with all Shift Supervisors by Operations Management.
- Direction was provided to Shift Supervision with respect to Assistant Unit Supervisor (AUS) duties and responsibilities including expectation for AUS monitoring/observing evolutions.
- Operation's preventative maintenance program is being expanded to include EDG buildings, as well as consideration for increasing frequency of rounds by the AUS, Shift Supervision or Operations Management. The preventative maintenance program is also being revised to ensure that all operators are observed.
- An assessment of the AUS position for effectiveness and to determine if AUS duties and responsibilities ensure quality plant operator performance is being performed.
- The Assistant Unit Supervisors and Shift Supervisors involved in the failure to take appropriate, prompt action when the mis-alignment on 6/14/96 actually occurred were counseled by Operations Management.
- An appropriate level manager has been placed on each shift to monitor rounds until the cause of the management failure was evaluated and until corrective action is complete.

Additional corrective actions not directly related to the two Key Issue areas include the following:

- The operability surveillance test procedure for the 'E' EDG was revised to include a verification that circuit breaker 0A51005 is properly aligned for automatic operation.
- The procedure for Operations Policies and Work Practices will be reviewed and clarified, if necessary, with respect to verification requirements of passive safety related components.
- Operations procedures utilized for conducting human performance investigations will be revised to provide enhanced guidance and to be consistent with the Nuclear Department corrective action (Condition Report) program.

- Operations procedures used for EDG operating and electrical distribution line-up verification will be enhanced as to sequence and layout of information formatting and equipment noun name consistency.
- Labeling of the 'E' EDG 4160 volt distribution bus 0A510 will be improved.

The event and its key findings were reviewed with Nuclear Department personnel stressing the importance of high quality work, absolute integrity for documentation completion, the need to seek help when required to successfully complete the job and the ramifications of not complying with these standards.

ADDITIONAL INFORMATION

Failed Component Identification: None

Previous Similar Reported Events: None identified