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 FACIL: 50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylv 05000387
 AUTH. NAME AUTHOR AFFILIATION
 METER, J.J. Pennsylvania Power & Light Co.
 STANLEY, H.G. Pennsylvania Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 94-008-00: on 940331, breaker lifting devices caused load centers to be outside of their dynamic qualification design basis. Caused by insufficient forces to load ctr. Corrective action: removed sliding assemblies & trolleys. W/940502 ltr.

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

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Pennsylvania Power & Light Company

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May 2, 1994

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

SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 94-008-00
FILE R41-2
PLAS - 601

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

Attached is Licensee Event Report 94-008-00. This report is being made pursuant to 10CFR50.73(a)(2)(ii)(B), in that Susquehanna Unit 1 and 2 were in a condition outside the design basis of the plant because breaker lifting devices mounted on the class 1E 125 VDC, 250 VDC and 480 VAC load centers caused the load centers to be outside of their dynamic (seismic and hydrodynamic) qualification design basis. The breaker lifting devices have subsequently been removed from the load centers.


H.G. Stanley
VP - Nuclear Operations

JJM/mjm

cc: Mr. T. T. Martin
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LICENSEE EVENT REPORT (LER)

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 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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

TITLE (4) **Class 1E 125 VDC, 250 VDC and 480 VAC Load Centers Outside Dynamic Design Basis**

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)
03	31	94	94	008	00	05	02	94	Susquehanna SES - U2		0 5 0 0 0 3 8 8
											0 5 0 0 0

OPERATING MODE (9) **1**

POWER LEVEL (10) **11010**

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

<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
<input type="checkbox"/> 20.405(a)(1)(iv)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME **Joseph J. Meter - Power Production Engineer** TELEPHONE NUMBER **7 1 7 5 4 2 1 - 1 8 7 3**

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

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15) **0 1 7 2 1 9 9 4**

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

On March 31, 1994, at 2250 hours with Unit 1 in Condition 1 at 100% power and Unit 2 in Condition 2 at 0% power, it was determined that breaker lifting devices mounted on all station class 1E 125 VDC, 250 VDC and 480 VAC load centers caused the load centers to be outside of their dynamic (seismic and hydrodynamic) qualification design basis. On 3/30/94, an Engineering Discrepancy Report (EDR) was generated to document the potential that the lifting devices may render the load centers unable to function as designed during a design basis seismic event. As a result of the above condition, the decision was made to remove the sliding assemblies and trolley portions of the devices while the operability analysis was in its final stages as a prudent measure. On 3/31/94 the operability assessment of the EDR was finalized and it determined that the load centers were outside their dynamic (seismic and hydrodynamic) qualification design basis. The results of the operability assessment also showed that the DC load centers were operable in their current configuration with the devices removed. The same assessment also concluded that the AC load centers were operable. The lifting devices were installed on the load centers during original construction per design documents and not addressed in the dynamic analysis. Investigation into the causes for this oversight is continuing. The load centers have been evaluated and are now within their dynamic design basis. Actions to prevent recurrence will include updating the applicable design drawings and installation and operating manuals for the load centers to show the breaker lifting devices are not part of the load center's dynamic qualification. A review of other safety related equipment will also be performed.



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LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Unit 1 Susquehanna Steam Electric Station	DOCKET NUMBER (2) 0 5 0 0 0 3 8 7	LER NUMBER (6)			PAGE (3)		
		YEAR 9 4	SEQUENTIAL NUMBER — 0 0 8	REVISION NUMBER — 0 0	0 2	OF	0 5

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

DESCRIPTION OF EVENT

On March 31, 1994, at 2250 hours with Unit 1 in Condition 1 at 100% power and Unit 2 in Condition 5 at 0% power, it was determined that breaker lifting devices mounted on all station 125 VDC (EIIS Code: EJ), 250 VDC (EIIS Code: EJ), and 480 VAC (EIIS Code: ED) load centers caused the load centers to be outside of their dynamic (seismic and hydrodynamic) qualification design basis. On 3/25/94 Engineers (Utility and Non-utility, non-operator licensed) performed a walkdown of safe shutdown components required to be dynamically qualified to gather as-installed data as part of an Individual Plant Evaluation of External Events (IPEEE) project. The as-installed data was later reviewed against the Seismic Qualification Report Team (SQRT) binder for individual components. During this review of the 125 VDC, 250 VDC and 480 VAC load centers, it was discovered that the breaker lifting devices mounted on the load centers were not considered in the dynamic qualification of the panels. On 3/30/94, an Engineering Discrepancy Report (EDR) was generated to document the potential that the lifting devices may render the load centers unable to function as designed during a design basis dynamic event. From 3/30/94 to 3/31/94 analysis of the as-found conditions via the EDR process continued, at 2250 hours on 3/31/94 the operability assessment was finalized. The operability assessment determined that the breaker lifting devices mounted to the load centers did cause the following DC load centers to be outside their seismic design basis and inoperable: 125 VDC - 1D612, 1D622, 1D632, 1D642, 2D612, 2D622, 2D632, and 2D642, 250 VDC - 1D652, 1D662, 2D652 and 2D662. The following AC load centers were also determined to be outside their seismic design basis and operable: 480 VAC - 1B210, 1B220, 1B230, 1B240, 2B210, 2B220, 2B230 and 2B240.

The breaker lifting devices consisted of rails secured to the load centers (except for some of the 480 VAC load centers which the rails were mounted above the load centers), a sliding assembly mounted on the rails and a trolley/winch assembly mounted on the sliding assembly. The sliding assembly moved length wise with respect to the load center and the trolley/winch moved perpendicular to the load center.

As a result of the load center being outside of their design basis, the following concurrently actions were taken: 1) Removal of the sliding assemblies and the trolley/winch assemblies from the above listed load centers and 2) Operability analysis of system/components in the load centers for dynamic events. The decision was made to remove the sliding assemblies and trolleys while the operability analysis was in its final stages as a prudent measure. Based on Engineering judgement, removal of the assemblies and trolleys would put the load centers in a seismically qualifiable configuration even though the rails remained attached to the load centers.

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

When the final operability assessment was completed at 2250 hours on 3/31/94, the results of the assessment were that the DC load centers were inoperable while the assemblies and trolleys were in place, and operable (i.e. able to perform as designed in a dynamic event) with the trolleys and assemblies removed. The same assessment also concluded that although the AC load centers were outside their dynamic (seismic and hydrodynamic) qualification design basis, they were operable with or without the assemblies and trolleys in place. The status of the in plant work to remove the trolleys and assemblies at that time was that the DC load centers required to be operable were complete and the AC load centers were in progress. Therefore, none of the station load centers were declared inoperable at that time. Removal of the assemblies and trolleys for all the station load centers was completed at approximately 0700 hours on 4/1/94.

CAUSE OF EVENT

The cause of the load centers not being within their dynamic (seismic and hydrodynamic) qualification design basis was that during the design basis dynamic event, the breaker lifting devices mounted to the top of the load centers were predicted to cause sufficient forces in the load centers to cause the internal components to change state. The lifting devices were installed during original construction. The reasons for why the breaker lifting devices were mounted to the load centers are that they are used during maintenance of the load center breakers and the devices are shown on design documents (i.e. drawings, installation and operation manuals and purchase orders). The causes for why these devices were not addressed in the dynamic analysis have not been finalized at this time. Retrieval and review of utility, AE, and vendor construction and design records has not yet been completed. Investigation into the causes is continuing.

REPORTABILITY/ANALYSIS

This event was determined to be reportable per 10CFR50.73(a)(2)(ii)(B), in that Susquehanna Units 1 and 2 were in a condition outside the design basis of the plant because Engineering evaluation of the design basis seismic event showed that the breaker lifting devices mounted on the 125 VDC, 250 VDC and 480 VAC load centers could result in sufficient forces in the load centers to cause the internal components to change state. For the 480 VAC load centers the contained relays only could change state. All of the relays in the 480 VAC load centers are part of alarm circuitry. These relays perform no safety function. The safety related loads would not be affected during a design basis seismic event even with the lifting devices attached to the load centers. Therefore, even though the load centers were outside of their design basis in that the relays could change state, there was no impact to the safety related loads supplied from the 480 VAC load centers. The 480 VAC load centers were operable with and without the lifting

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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devices attached. For the 125 and 250 VDC load centers the relays, contactors, starters and circuit breakers could change state. The change of state of the equipment in the 250 VDC load centers during a design basis seismic event could have resulted in the loss of the High Pressure Coolant Injection (EIIS Code: BJ) system, the Reactor Core Isolation Cooling (EIIS Code: BN) system and operation of the outboard Containment Isolation Valves (EIIS Code: JM).

The change of state of the equipment in the 125 VDC load centers during a design basis seismic event could have resulted in the loss of Emergency Diesel Generators A,B,C,D (EIIS Code: EK), Loss of Coolant Accident Initiation Logic division I and division II (EIIS Code: JE), Core Spray (EIIS Code: BM) pumps, Residual Heat Removal (EIIS Code: BO) pumps, Emergency Service Water (EIIS Code: BI) pumps, Residual Heat Removal Service Water (EIIS Code: KE) pumps, Automatic Depressurization System (EIIS Code: B), Control Structure HVAC loop A and loop B (EIIS Code: VI), Reactor Recirculation pump trips (EIIS Code: AD), and the 13 KV and 4.16 KV circuit breaker trips (EIIS Code: EB).

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 05/02/94.

CORRECTIVE ACTIONS

As stated previously, the immediate corrective action was to remove the sliding assemblies and trolleys from the load centers. Subsequent to that activity, the load centers have been analyzed with the remaining rails attached and are within their dynamic design basis. The applicable SQRT binders have also been updated to reflect the in plant configurations. Actions to prevent recurrence will include updating the applicable design drawings and installation and operating manuals for the load centers to show the breaker lifting devices are not part of the load centers dynamic qualification. Since maintenance of the load center breakers in the future will require a lifting device, a procedure will be developed/revised specifying when and how the removed devices can be used or an alternate method of lifting the breakers will be developed. The retrieval and review of construction records will be continued as part of the cause analysis of the event and results will be reported in an update to this report. Lastly, a list of safety related equipment that have "for maintenance uses only" accessory equipment attached to them will be developed and the equipment will be walked down and analyzed if necessary to ensure they are within their dynamic design basis.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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

ADDITIONAL INFORMATION

Failed Component Identification: Not Applicable

Past Similar Events: None

A review of past Licensee Event Reports (LERs) for the station identified no previous events involving equipment outside of its dynamic design basis.