

INFORMATION SYSTEM (RIDS)

ACCESSION NBR: 8707230525 DOC. DATE: 87/07/20 NOTARIZED: NO DOCKET #
 FACIL: 50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylv 05000387
 AUTH. NAME AUTHOR AFFILIATION
 HIRT, J. A. Pennsylvania Power & Light Co.
 BYRAM, R. G. Pennsylvania Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 86-024-01: on 860703, discovered that seismic relays not qualified. Relays replaced w/seismically qualified components on 860612, prior to restart. Installation of unqualified HGA' relays considered isolated incident. W/870720 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: 1cy NMSS/FCAF/PM. LPDR 2cys Transcripts. 05000387

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	PD1-2 LA THADANI, M	1 1 1 1	PD1-2 PD	1 1
INTERNAL:	ACRS MICHELSON	1 1	ACRS MOELLER	2 2
	AEOD/DOA	1 1	AEOD/DSP/NAS	1 1
	AEOD/DSP/ROAB	2 2	AEOD/DSP/TPAB	1 1
	DEDRO	1 1	NRR/DEST/ADE	1 0
	NRR/DEST/ADS	1 0	NRR/DEST/CEB	1 1
	NRR/DEST/ELB	1 1	NRR/DEST/ICSB	1 1
	NRR/DEST/MEB	1 1	NRR/DEST/MTB	1 1
	NRR/DEST/PSB	1 1	NRR/DEST/RSB	1 1
	NRR/DEST/SGB	1 1	NRR/DLPQ/HFB	1 1
	NRR/DLPQ/QAB	1 1	NRR/DOEA/EAB	1 1
	NRR/DREP/RAB	1 1	NRR/DREP/RPB	2 2
	NRR/PMAS/ILRB	1 1	NRR/PMAS/PTSB	1 1
	REG FILE 02	1 1	RES DEPY GI	1 1
	RES TELFORD, J	1 1	RES/DE/EIB	1 1
	RGN1 FILE 01	1 1		
EXTERNAL:	EG&G GROH, M	5 5	H ST LOBBY WARD	1 1
	LPDR	2 2	NRC PDR	1 1
	NSIC HARRIS, J	1 1	NSIC MAYS, G	1 1
NOTES:		3 3		

TOTAL NUMBER OF COPIES REQUIRED: LTTR 49 ENCL 47

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Susquehanna Steam Electric Station (SSES) Unit One	DOCKET NUMBER (2) 0 5 0 0 0 3 8 7	PAGE (3) 1 of 0 4
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TITLE (4)
Automatic Start Relays for the Emergency Service Water Pumps Not Seismically Qualified

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 3	8 6	8 6	0 2 4	0 1	0 7	2 0	8 7		0 5 0 0 0 3 8 8
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)										

OPERATING MODE (9) 4	POWER LEVEL (10) 0 0 0	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 365A)
		20.405(a)(1)(iii)	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 Jeffrey A. Hirt, Engineer Level II	TELEPHONE NUMBER
	AREA CODE: 7 1 1 7 5 4 1 2 - 1 3 9 1 7

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS										
B	B	I	R	L	Y	2	W	1	2	3	N								

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)

On June 2, 1986, the seismic qualification of the Emergency Service Water (ESW) automatic pump start relays was questioned by a design engineer. An Engineering Work Request (EWR) was initiated on June 9, 1986 to determine if the relays were seismically qualified as required by the Final Safety Analysis Report. The EWR was completed July 3, 1986 and found that the relays were not seismically qualified. At the time when the seismic qualification was questioned, Units One and Two were shutdown (Condition 4). The relays were replaced by June 12, 1986 with seismically qualified components prior to restarting the units.

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

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

EVENT DESCRIPTION/CORRECTIVE ACTION

On June 2, 1986, a design engineer initiated a nonconformance report questioning the seismic qualification of the four Emergency Service Water (ESW) (EIIS Code: BI) automatic pump start relays (IEEE Code: RLY2). An Engineering Work Request (EWR) was initiated on June 9, 1986 to determine if the relays were seismically qualified as required by the Final Safety Analysis Report. The EWR was completed July 3, 1986 and found that the relays were not seismically qualified. It cited a Wyle Laboratory test report which stated that the contacts of similar Westinghouse HGA relays were observed to chatter during the seismic tests conducted at their Huntsville laboratory. At the time when the seismic qualification was questioned, Units One and Two were shutdown (Condition 4). The relays were replaced by June 12, 1986 with seismically qualified components prior to restarting the units.

ANALYSIS OF EVENT

The relays were part of the automatic start circuitry which is designed to start the ESW pumps, after a 40 to 50 second time delay, following a diesel generator initiation signal. The ESW pumps provide cooling water to the diesels. If the pumps failed to start, the diesel generators would trip on high temperature. There was a possibility that during a safe shutdown earthquake (SSE) and loss of off-site power event the relay contacts would remain open, preventing the automatic start of the ESW pumps. The control room operator would have been able to start the pumps manually, since the non-seismic relays only affected the automatic start circuitry. It was also possible, because of the relay contacts chattering during a seismic event, that if a loss of off-site power, SSE, and loss of coolant accident occurred the ESW pumps could have started at the same time as the Residual Heat Removal (EIIS Code: BP) pumps. This scenario would have put an extra starting load on the diesel generators which may have prevented the emergency core coolant system pumps from reaching their required speed as quickly as assumed in the accident analysis.

ADDITIONAL CORRECTIVE ACTIONS

During June of 1986, HGA relays, which were not seismically qualified, were identified as being installed in the 4KV switchgear cubicles for the Emergency Service Water Pumps. The resolution of this problem was the implementation of a modification which replaced the unqualified relays with relays suitable for the seismic spectra anticipated at the switchgear location.

A review of the circumstances surrounding the identification of the unqualified HGA relays prompted concerns for similar installations of unqualified relays in other safety related circuits. It was apparent that a review of the event should be performed to determine if this was an isolated case or if there are other examples of the incorrect application of unqualified HGA relays in safety related circuits. A review of the facts concerning the unqualified relays was conducted and the findings are described below.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

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

A review of drawings E-146, SH 1, Revisions 1 through 16 and E-146, SH 2, Revisions 1 through 24 was conducted to ascertain when the HGA relays were designed into the ESW control circuit. The relays under discussion are:

- 62AX2A - 1A20108
- 62AX2A - 1A20208
- 62AX2A - 1A20308
- 62AZ2A - 1A20408

The drawing revision blocks revealed that the HGA relays were designed as part of the circuit since Revision 2 - 10/14/75. As a result it is safe to assume that the relays existed intact in the switchgear cubicles from the delivery date of the switchgear, 1978, to the date of discovery which revealed the unqualified relays in 1986.

A review of the seismic qualification of the 4KV switchgear was also performed. The review included the inspection of the WYLE LAB test reports 57577-1, 58642, Rev B, and 58664 Rev B. The report clearly stated that the subject HGA relays did not meet the acceptance criteria of the seismic test.

As part of the Seismic analysis program and in response to the test data, Bechtel, notified PP&L, via BLP-14151, dated 2/23/81, of the problems associated with the HGA relays and other switchgear components encountered during seismic testing at WYLE LABS. In BLP-14380, dated 3/16/81, Bechtel proposed to PP&L that a series of modifications be produced to rectify the problems cited by WYLE LABS. Design Change Request (DCR) 451 was processed to accomplish this task. The DCR included authorization for the investigation of alternatives and the eventual production of modifications as warranted by the analysis. A review of the modification revealed that numerous components were replaced. However, the subject HGA relays were not included in the modification documentation.

In order to determine the cause of this omission a review of the E-146 drawings was conducted for the revision that was current as of 4/25/81. This review revealed an important fact which may help substantiate the PP&L belief that the unqualified relays installed in the ESW switchgear cubicles were the result of an isolated incident.

In the design process at SSES which was utilized at the time DCR was processed, the DCR was prepared by Bechtel - San Francisco Home Office (SFHO). The research for the modification would have included the identification of all components discovered by WYLE LABS which did not meet seismic qualification. The design research would include a review of the pertinent switchgear drawings to identify the location and application of unqualified HGA relays in the 4KV switchgear cubicles. As mentioned above our review of the ESW switchgear drawings, current in 4/81, revealed that the contact development for the HGA relays in question was not presented on the lower half of the E-146 SH 2 print. This fact is crucial, since the simplest method available to the designer in SFHO to identify the HGA relays was a review of the contact development. Since the development of the relay was not shown even though the relay was used in the scheme, the subject HGA's could have been easily overlooked.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

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

In summary; the installation of the unqualified HGA relays, discovered in the ESW switchgear cubicles in 1986, is considered an isolated incident. This incident is explainable in accordance with the facts presented above. Additionally, it is important to note that the unqualified relay was clearly identified by the seismic qualification program. The circumstances which allowed the relays to remain installed were unique. The designer, hampered by the omitted contact development, did not include the replacement of the unqualified HGA relays in DCR 451.

A review of electrical prints to two safety related systems, core spray and Emergency Safeguard system transformers, was conducted which further substantiates that the unqualified relays were an isolated incident. The review revealed that no HGA relays were installed in the systems which would impair the system from performing its design function during a seismic event. In addition, the contact developments, on the electrical prints reviewed, were complete. (i.e., relays used in the scheme were presented on the lower half of the print).



Pennsylvania Power & Light Company

P.O. Box 451 • Berwick, PA 18603-0451 • 717/542-2151

July 20, 1987

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

SUSQUEHANNA STEAM ELECTRIC STATION
LICENSE EVENT REPORT 86-024-01
FILE R41-2
PLAS-270

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

Attached is Licensee Event Report (LER) 86-024-01 which is an update to LER 86-024-00 filed on July 21, 1986. This event was determined reportable per 10CFR50.73 (a) (2) (v), in that the Emergency Service Water automatic pump start relays were not seismically qualified.

R. G. Byram
Superintendent of Plant-Susquehanna

JAH/cdn

cc: Mr. William T. Russell
Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Mr. Loren Plisco
Resident Inspector
U.S. Nuclear Regulatory Commission
P.O. Box 52
Shickshinny, PA 18655

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