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6710-96-2398
December 12, 1996

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Subject: Three Mile Island Nuclear Station, Unit I (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
LER 96-001-00

This letter transmits Licensee Event Report (LER) number 96-001-00 that resulted from the electrical system engineer's investigation of the seismic qualification of Class 1E 4160 VAC switchgear. The investigation was initiated by a plant event reported by the Susquehanna Station which was being reviewed for applicability to TMI-1. Public health and safety were unaffected.

This LER is being submitted pursuant to 10 CFR 50.73, using the required NRC forms (attached). NRC form 366 contains an abstract which provides a brief description of the event. For a complete understanding of the event, refer to the text of the report provided on Form 366A.

Sincerely,



J. Knubel

Vice President and Director, TMI

WGH

Attachments

cc: Administrator, Region I
TMI Senior Resident Inspector
TMI-1 Senior Project Manager

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LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION
COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO
THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING
BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33),
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE
PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET,
WASHINGTON, DC 20503.

FACILITY NAME (1)

THREE MILE ISLAND, UNIT 1

DOCKET NUMBER (2)

50-289

PAGE (3)

1 OF 3

TITLE (4)

INVESTIGATION OF THE SEISMIC QUALIFICATION OF CLASS 1E 4160 VAC WESTINGHOUSE BREAKERS

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 NAME	DOCKET NUMBER	
11	12	96	96	001	00	12	12	96	Susquehanna 1&2	50-387	
									Comanche Peak 1&2	50-445	
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
POWER LEVEL (10) 100%			20.2201(b)			20.2203(a)(2)(v)			50.73(a)(2)(i)		50.73(a)(2)(viii)
			20.2203(a)(1)			20.2203(a)(3)(i)			X 50.73(a)(2)(ii)		50.73(a)(2)(x)
			20.2203(a)(2)(i)			20.2203(a)(3)(ii)			50.73(a)(2)(iii)		73.71
			20.2203(a)(2)(ii)			20.2203(a)(4)			50.73(a)(2)(iv)		OTHER
			20.2203(a)(2)(iii)			50.36(c)(1)			50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
20.2203(a)(2)(iv)			50.36(c)(2)			50.73(a)(2)(vii)					

LICENSEE CONTACT FOR THIS LER (12)

NAME

W. G. HEYSEK, TMI LICENSING ENGINEER

TELEPHONE NUMBER (Include Area Code)

717-948-8191

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
A	EB	BKR	W120	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	NO	EXPECTED SUBMISSION	MONTH	DAY	YEAR
	X				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On November 12, 1996 during review of a plant event reported to the NRC by the Susquehanna Station, TMI-1 engineers determined that a similar condition existed at TMI-1. Susquehanna Station reported that during a postulated seismic event, Westinghouse Class 1E 4160 VAC switchgear [EB/BKR]* with breakers in the racked out position were not seismically qualified. The breakers, when racked out, are no longer tightly constrained within the module cell and could cause relays associated with safety related equipment to trip or cause damage to the bus during a seismic event.

TMI-1 engineers identified that three Westinghouse Class 1E 4160 VAC switchgear modules had breakers in the racked out position. It was also identified that evaluations, performed under the auspices of the Seismic Qualification Users Group criteria to verify the seismic qualification of nuclear plant equipment, had implicitly assumed that all breakers are racked in during plant operation. That assumption was incorrect.

The Plant Review Group met and following discussion of the issue, concluded the condition to be outside the plant design basis since Class 1E 4160 VAC switchgear is required to be seismically qualified. The root cause of the event was identified as personnel error. Within an hour, the event was reported to the NRC via the ENS and the racked out breakers were removed from their modules and seismically restrained.

The event is being reported per 10 CFR 50.73(a)(2)(ii)(B).

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
THREE MILE ISLAND, UNIT 1	50-289	95	-- 001	-- 00	2 OF 3

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

I. PLANT OPERATING CONDITIONS BEFORE THE EVENT

The plant was operating at 100% power at the time of the event.

II. STATUS OF STRUCTURES, COMPONENTS OR SYSTEMS THAT WERE INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT

No systems, structures or components were out-of-service that contributed to this event.

III. EVENT DESCRIPTION

On November 11, 1996 during perusal of the NRC Daily Report section of the INPO network, bulletin PS 6140 was reviewed and determined to be potentially applicable to TMI-1. PS 6140 identified that Pennsylvania Power and Light's (PP&L) Susquehanna Station Units 1&2 had reported that the Class 1E 4160 VAC switchgear was not seismically qualified when the breakers [EB/BKR] are in a racked out position within the switchgear module. During a previous discussion with personnel at the Susquehanna units, it had been identified that switchgear there was similar to that installed at TMI-1.

On November 12, 1996 the TMI-1 4160 VAC switchgear modules were inspected by the System Engineer and a Seismic Capability Engineer. During the inspection, a breaker was moved from its fully racked in position to a position completely out of the module cell. Measurements and photographs were taken in both positions to document the findings. By 1330 hours, contact was made with the cognizant PP&L seismic engineer and information exchanged further identified that the problem was generic to a particular model of Westinghouse 4160 VAC switchgear. During a seismic event, the racked out breaker could move within the module cell and has the potential to cause the failure of associated equipment by tripping protective relays located on the module doors, thereby preventing operation of nuclear safety related equipment.

A Plant Review Group meeting was held at 1400 hours to review the issue, identify immediate corrective actions and discuss reportability. It was identified that at least one breaker on each Class 1E bus was in a racked out position within its module. Therefore both of the Engineered Safeguards (ES) buses were determined to be outside the design basis. The root cause of the event was determined to be personnel error. On two occasions, a previous analysis by the equipment vendor and the on-site walkdown by GPU Nuclear personnel in support of activities concerning Unresolved Safety Issue (USI) A-46, there was a failure to consider that the breakers would be in any position other than racked in when the bus is returned to service.

The condition was determined to be reportable under 10 CFR 50.73(a)(2)(ii)(B) and a one hour report was made at 1420 hours on November 12, 1996.

IV. COMPONENT FAILURE DATA

None.

V. AUTOMATIC OR MANUAL INITIATED SAFETY SYSTEM RESPONSES

Since there was no physical plant event involved with the item being reported herein, there were no safety system responses, automatic or manual.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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

VI. ASSESSMENT OF THE SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

There were no safety consequences associated with the event since no transient condition occurred which would have required changes to the plant configuration or manual or automatic safety system responses. Extreme care was used during the removal the racked out breakers from their modules to preclude an event similar to that which was attributed to the postulated event.

VII. PREVIOUS EVENTS OF A SIMILAR NATURE

There have been no previous events of a similar nature at Three Mile Island Unit 1.

VIII. CORRECTIVE ACTIONS

Immediate corrective actions involved removal of the racked out breakers from their associated modules. As a result, the feeder breaker for the swing High Pressure Injection Pump and a spare breaker in a spare cell from modules of the 1D ES 4160 VAC switchgear were removed and the spare breaker in a spare module cell located in the 1E ES 4160 VAC switchgear was removed. The three breakers were seismically restrained to a wall. The seismic restraints will be used until the module modifications discussed below are completed. A temporary change to the Switching and Tagging Administrative Procedure, AP 1002, was made to require the removal of racked out ES breakers from their switchgear modules.

With regard to corrective actions directly associated with the root cause, personnel error, a vulnerability of the Seismic Review Team (SRT) to not recognize situations or details that could adversely affect equipment seismic capacity was identified. During past walkdowns performed during plant or bus outages, the conditions in switchgear were not recognized as being distinctly different than those which would exist during normal operation. To alleviate this vulnerability, administrative controls will be established in procedures implementing use of the SQUG methodology in the seismic verification process (for new and replacement equipment) which will specifically address the confirmation of the equipment's operating condition as it relates to seismic performance.

Neither the 1D nor 1E ES 4160 VAC buses will be declared inoperable and no time clocks will be entered when the breakers are being moved from their fully racked in to seismically stored positions and vice versa. When the breakers are placed in the test position for short periods to perform surveillance testing, preventive maintenance tasks and troubleshooting activities, the breakers are also not seismically qualified. This situation requires further evaluation and will be addressed in the supplement to this LER. No breakers in the 1D or 1E ES 4160 VAC buses are currently in the test position and none of these breakers will be moved to the test position before the evaluation results prescribing the actions necessary to attain seismic qualification for breakers in the test position are available.

A long term corrective action associated with these particular Class 1E 4160 VAC switchgear modules has been identified. It involves making permanent the temporary change to AP 1002 which required that the breaker be seismically restrained when it is racked out.

Action was also taken to evaluate Class 1E 480 VAC switchgear modules of a different design for a similar seismic qualification vulnerability. Based on field inspection and vendor manual review, these switchgear modules were found to be of a significantly different design. Their design provides breaker restraint in both the test and racked-out positions, and preliminary calculations show that they are not vulnerable to a similar qualification problem. The calculation will be design verified.

* The Energy Industry Identification System (EIIIS), System Identification (SI) and Component Function Identification (CFI) Codes are included in brackets, "[SI/CFI]", where applicable, as required by 10 CFR 50.73(b)(2)(ii)(F).