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

SUBJECT: LER 90-028-00:on 901121,determined that postulated single failure could place plant in condition outside design basis. Caused by inadequate original design of control structure chilled water sys.Sys modified.W/901219 ltr.

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

NOTES:LPDR 1 cy Transcripts. 05000387

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December 19, 1990

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

SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 90-028-00
PLAS -464 FILE R41-2

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

Attached is Licensee Event Report 90-028-00. A condition was determined reportable per 10CFR50.73(a)(2)(ii)(B) in that a postulated, independent, single failure of equipment concurrent with a Design Basis Accident could have placed the plant in a condition that could be outside of its analyzed design basis.

H. G. Stanley
Superintendent of Plant - Susquehanna

MLC/mjm

cc: Mr. T. T. Martin
Regional Administrator, Region I
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IE24

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), U.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 0 4

TITLE (4)

Postulated Single Failure Could Have Placed the Plant in a Condition Outside 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)
										0 5 0 0 0
1 1	2 1	9 0	9 0	0 2 8	0 0	1 2	1 9	9 0		0 5 0 0 0

OPERATING MODE (9)	1
POWER LEVEL (10)	0 6 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)	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)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
20.405(a)(1)(iv)	X 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
	AREA CODE
Michael L. Crist - Compliance Evaluator	7 1 7 5 4 2 - 3 2 8 9

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	

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)

On July 14, 1990 Engineering Discrepancy Report (EDR) G00059 was issued describing a condition that existed with the original design of the Unit 1 Emergency Switch Gear Room (ESGR) Cooling System. It was discovered that in the event of a Design Basis Accident (DBA) concurrent with a postulated, independent, single failure of either the chilled water supply, return or bypass valve for the Control Structure Chilled Water (CSCW) loop in service, chilled water to the operating ESGR cooler would not be established. The loss of cooling to the ESGRs would ultimately result in room temperatures exceeding those where switchgear operation would be assured. On July 25, 1990 the condition was determined to be reportable under 10CFR50.9. As such, a report outlining the condition and corrective actions was submitted to NRC Region I on September 13, 1990. A modification to the CSCW system was completed on October 8, 1990 which eliminated the postulated single failure issue. On November 21, 1990 the condition was re-evaluated and was determined to be reportable as a condition outside the design basis of the plant. As such, at 1350 hours an ENS call was made in accordance with 10CFR50.72(b)(1)(ii)(B). Unit 1 was operating in Condition 1 at 60% power at the time of the notification. The cause of this condition was inadequate original design of the CSCW system by the Architect - Engineer for the station.

EVENT DESCRIPTION

Background

During normal operation, the Reactor Building Chilled Water System (RBCW, EIIS Code: KM) provides chilled water to the Emergency Switchgear Room (ESGR, EIIS Code: EB) Cooling System. RBCW flows through both the A and B ESGR coolers simultaneously. An emergency cooling coil in each ESGR cooler is supplied by Control Structure Chilled Water (CSCW, EIIS Code: KM). However, CSCW does not flow through the ESGR coolers during normal operation even though a loop of CSCW is in service.

Following a Design Basis Accident (DBA), RBCW is not available; therefore, the CSCW cooling coils are used for the Unit 1 cooling units. The 'A' ESGR cooler is supplied by the 'A' CSCW system; the 'B' ESGR cooler is supplied by the 'B' CSCW system. Each ESGR cooler is 100% capacity unit. A simplified sketch of one loop is provided as part of this report. To establish the flow path to the ESGR coolers during a DBA, the CSCW supply and return valves (HV-08603 and HV-08601) must open and a bypass valve (HV-08602) must close.

Event

On July 14, 1990 Engineering Discrepancy Report (EDR) G00059 was issued describing a condition that existed with the original design of the Unit 1 ESGR Cooling System. It was discovered that in the event of a DBA concurrent with a postulated, independent, single failure of either the chilled water supply, return or bypass valve for the CSCW loop in service, chilled water to the operating ESGR cooler would not be established and the existing system logic would not initiate an automatic swap to establish switchgear cooling from the redundant CSCW train and ESGR cooler. During this postulated event the other chilled water loop remains available for service but there is no clear indication to the Control Room operator that would indicate the need to place the loop in service. This scenario results in inadequate ESGR cooling. The loss of cooling to the ESGRs would ultimately result in room temperatures exceeding those where switchgear operation would be assured.

On July 25, 1990 the Discrepancy Review Committee met to assess the condition identified by EDR G00059. It was determined that the condition was not reportable under 10CFR50.72 and 50.73, however, the condition was considered reportable under 10CFR50.9. As such, a phone call was made to NRC Region I on July 26, 1990 and a follow-up 10CFR50.9 Report was submitted on September 13, 1990, detailing the condition and corrective actions.

A modification to the CSCW system was completed on October 8, 1990. The modification permanently repositioned the chilled water valves to ensure CSCW is always flowing through the ESGR cooler from the in service CSCW loop. This action eliminated the postulated single failure scenario.

On November 21, 1990 at 1330 hours with Unit 1 operating in Condition 1 at 60% power the condition was re-evaluated and was determined to be reportable as a condition outside the design basis of the plant. As such, at 1350 hours an ENS call was made in accordance with 10CFR50.72(b)(1)(ii)(B). Unit 2 is not affected by this condition as it has a different design.

CAUSE OF EVENT

The cause of this condition was inadequate original design of the CSCW system by the Architect - Engineer for the station.

REPORTABILITY/ANALYSIS

This condition was determined to be reportable per 10CFR50.73(a)(2)(ii)(B) in that the postulated, independent, single failure of any one of the subject control structure chilled water valves, concurrent with a DBA, could place the unit in a condition outside of its analyzed design basis. The consequences of the postulated event have been analyzed. With current conservative assumptions made within the analysis the postulated event is predicted to ultimately result in conditions above acceptable ambient temperatures, and loss of the emergency switchgear and associated loads. Thus, the unit's ability to provide long-term core cooling during a DBA would be compromised. Modifications to the CSCW system have eliminated this postulated scenario.

In accordance with the guidance provided in NUREG 1022 Supplement 1, Item 14.1, the required submission date for this report was determined to be December 21, 1990.

CORRECTIVE ACTIONS

A modification to the CSCW system was completed on October 8, 1990. The modification permanently repositioned the chilled water valves to ensure CSCW is always flowing through the ESGR cooler from the in service CSCW loop. This action has eliminated the postulated single failure scenario.

ADDITIONAL INFORMATION

Failed Component Identification: Not applicable.

Similar Reportable Events: Review of past reportable events has determined that LER 90-013, Docket No. 387/License No. 14 is similar. Both reports document that a postulated, independent, single failure concurrent with a DBA could place the the plant in a condition outside of its analyzed design basis.

SIMPLIFIED SKETCH OF A SINGLE LOOP OF CONTROL STRUCTURE CHILLED WATER AND UNIT 1 SWITCHGEAR ROOM COOLING (NORMAL OPERATING PATH PRIOR TO MODIFICATION SHOWN)