

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) Susquehanna Steam Electric Station - Unit 2						DOCKET NUMBER(2) 0 5 0 0 0 3 8 8 1				PAGE (3) OF 0 4	
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TITLE (4)  
Isolation of Both Loops of Containment Radiation Monitoring

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	2	09	7	9	7	0	3	24	9	7	0	5	0	0	0

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 1 ; (Check one or more of the following) (11)										
POWER LEVEL (10) 0 9 4	20.402(b)	<input checked="" type="checkbox"/>	50.73(a)(2)(v)	<input type="checkbox"/>	73.71(b)						
	20.405(a)(1)(X)	<input type="checkbox"/>	50.73(a)(2)(v)	<input type="checkbox"/>	73.71(c)						
	20.405(a)(1)(a)	<input type="checkbox"/>	50.73(a)(2)(v)(i)	<input type="checkbox"/>	OTHER (Specify in Abstract below and in Text, NRC Form 366A)						
	20.405(a)(1)(u)	<input checked="" type="checkbox"/>	50.73(a)(2)(i)	<input type="checkbox"/>							
	20.405(a)(1)(v)	<input type="checkbox"/>	50.73(a)(2)(e)	<input type="checkbox"/>							
	20.405(a)(1)(v)	<input type="checkbox"/>	50.73(a)(2)(u)	<input type="checkbox"/>							

NAME Stephen J. Ellis - Project Engineer, Licensing						TELEPHONE NUMBER 7 1 7 5 4 2 - 3 5 3 7					
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CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NFRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NFRDS	
X	J	C	E	C	B	D	G	0	8	2

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)				<input type="checkbox"/> NO	0	4	09

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

At 0347 hours on February 20, 1997, with Unit 2 in Condition 1 (Power Operation) at 94% power, the control room received indication of a half SCRAM on Division 1. The half SCRAM resulted from a trip of the Reactor Protection System (RPS) (EIS Code: JC) which also caused a Division I isolation signal to be generated. The following Engineered Safety Feature (ESF) actuations occurred: Reactor Water Cleanup isolated, Reactor Building Ventilation Zones isolated, Standby Gas Treatment and Control Room Emergency Outside Air Systems were initiated. Also, both channels of Containment Radiation Monitors (CRMs) (EIS Code: IL) isolated, requiring entry into Technical Specification 3.0.3, which constitutes a condition prohibited by Technical Specifications. RPS was re-powered from its alternate source and the plant equipment was restored in accordance with operation procedures.

At 1640 hours on February 22, 1997, with Unit 2 in Condition 1 (Power Operation) at 93% power, Technical Specification 3.0.3 was again entered when both CRMs were removed from service in preparation for RPS transfer from the alternate to the normal power supply following repair of the RPS Motor-Generator (M-G) set and restoration to normal alignment.

The initiating event is reportable pursuant to 10CFR50.73(a)(2)(iv) in that this event resulted in unplanned ESF actuations. Additionally, the event is reportable per 10CFR50.73(a)(2)(i)(B) in that the loss of both CRMs requires entry into Technical Specification 3.0.3, which constitutes a condition prohibited by the Technical Specifications. There were no safety consequences or compromises to the public health and safety as a result of either event. A Technical Specification change request has been submitted to the NRC to revise Technical Specification Limiting Condition for Operation Action Statements for CRMs. Actions to prevent recurrence include: Replacement of all RPS M-G set voltage regulator boards; failure analysis of the removed voltage regulator board; and review of the preventative maintenance program for RPS.

Subsequent to this event, on March 11, 1997, the RPS Division II tripped also, as a result of a voltage regulator failure. This second event will be addressed in a supplement to this Licensee Event Report, including any potential generic implications..

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**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

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

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

**EVENT DESCRIPTION**

At 0347 hours on February 20, 1997, with Unit 2 in Condition 1 (Power Operation) at 94%, the control room received a Division I half SCRAM. The half SCRAM resulted in Reactor Water Cleanup (RWCU) isolation, isolation of both Containment Radiation Monitors (CRMs), Reactor Building Ventilation Zone isolations on Division I, and subsequent Standby Gas Treatment and Control Room Emergency Outside Air System initiations. The half SCRAM on Division I was due to the trip of the Electronic Protective Assemble (EPA) breakers of the Reactor Protection System (RPS) (EISS Code: JC). The RPS trip occurred as a result of a voltage fluctuation on the output of the RPS Motor-Generator (M-G) set, which is its normal power supply. Technical Specification 3.0.3 was entered when both CRMs (EISS Code: IL) isolated. The RPS bus was manually transferred to its alternate power supply and system restoration commenced.

At 1640 hours on February 22, 1997, with Unit 2 in Condition 1 (Power Operation) at 93% power, Technical Specification 3.0.3 was again entered when both CRMs were removed from service at the same time during a planned transfer of the RPS system from its alternate power supply to its normal power supply. This action was a result of the event described above, and was required to restore the unit to its normal (preferred) alignment.

The design of RPS requires a manual transfer between the normal and alternate supplies in a break-before-make sequence. The de-energization of the RPS bus causes the system to actuate. The design of the isolation feature for the CRMs is that for an actuation of either Division of RPS, both loops of the CRM will isolate. The CRMs are used for detection of leakage in the primary containment during normal operation and are not required post-accident.

**CAUSE OF EVENT**

The conclusion of the investigation of the event of February 20, 1997 is that the loss of RPS was caused by an aging component on the voltage regulator control card associated with the RPS M-G set output voltage. The voltage regulator circuit board was replaced with an acceptable one that was previously used in the Unit 1 "A" RPS M-G set. This is the first failure of an RPS M-G Set Voltage Regulator in plant history. The suspect voltage regulator has been sent to the manufacturer (GE) to determine the failure mechanism.

Technical Specification 3.4.3.1 does not adequately address isolation of both loops of CRMs from the containment. Entry into Technical Specification 3.0.3 was therefore necessary since both loops of CRMs were isolated from the containment following the RPS trip and during the planned transfer of "A" RPS from its alternate to its normal power supply during restoration.

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

FACILITY NAME (1)  Unit 2  Susquehanna Steam Electric Station	DOCKET NUMBER (2)  0   5   0   0   0   3   8   8	LER NUMBER (6)	PAGE (3)															
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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)

Subsequent to the event described herein, a trip of Unit 2 RPS (Division II) occurred on March 11, 1997. The trip has been identified to be caused again by the failure of the M-G set voltage regulator. Since this latest trip is due to a failure of the same component as the Division I trip, both failures preliminarily appear to be age related and are being considered as potential common mode equipment failures. This will be addressed via a supplemental report to be issued on or before April 9, 1997.

**REPORTABILITY/ANALYSIS**

This event was determined to be reportable per 10CFR50.73(a)(2)(iv) in that Susquehanna SES Unit 2 experienced the following ESF actuations as a result of the RPS trip: Isolation of RWCU, initiation of Standby Gas Treatment, and an initiation of the Control Room Emergency Outside Air System. The isolations and initiations received were as expected with regard to a RPS trip.

Additionally, the event was determined to be reportable per 10CFR50.73(a)(2)(i)(B), in that Susquehanna SES Unit 1 was in a condition prohibited by the Technical Specifications when both loops of the Containment Radiation Monitors were isolated from the drywell at the same time, requiring entry into LCO 3.0.3, both following the RPS trip and during the RPS restoration back to the Normal Power Supply. Technical Specification 3.4.3.1 requires that one loop of CRMs (one gaseous channel and one particulate channel) be operable and aligned to the drywell during Operating Conditions 1, 2 and 3.

The isolation of both loops of CRMs did not affect the ability of the plant to shutdown safely, nor was the health and safety of the public challenged. Other leak detection systems were operable when both CRM loops were isolated; therefore, a leak in the drywell would have been detected. The plant response to a postulated transient was not changed as a result of these events and the plant responded as expected.

In accordance with the guidelines provided in NUREG-1022, Supplement 1, Item 14.1, the required submission date for this report was determined to be March 24, 1997.

**CORRECTIVE ACTIONS**

The following corrective actions have been taken:

- RPS power was restored following the initial event by transferring to the alternate power supply.
- The voltage regulator circuit card was replaced.



