

## PRECURSOR DESCRIPTION SHEET

LER No.: 318/86-006  
Event Description: Trip occurs, and one atmospheric dump valve  
fails to close  
Date of Event: September 5, 1986  
Plant: Calvert Cliffs 2

### EVENT DESCRIPTION

#### Sequence

While the reactor was at 100% power, a surge capacitor in the 21A RCP failed and shorted to ground. The RCP tripped off, which led to an automatic reactor trip on low flow.

The cooldown rate was faster than expected because an atmospheric steam dump valve was stuck open. It was closed manually after 22 min.

#### Corrective Action

The solenoid valve associated with the atmospheric dump valve was found to be leaking high-pressure air by its seats. The solenoid valve materials were replaced.

#### Plant/Event Data

##### Systems Involved:

RCS and atmospheric steam dump

##### Components and Failure Modes Involved:

RCP — failed in operation

Atmospheric steam dump valve — failed to close on demand

Component Unavailability Duration: NA

Plant Operating Mode: 1 (100% power)

Discovery Method: Operational event

Reactor Age: 9.8 years

Plant Type: PWR

#### Comments

None

Event Identifier: 318/86-006

## MODELING CONSIDERATIONS AND DECISIONS

### Initiators Modeled and Initiator Nonrecovery Estimate

Transient	1.0	Nonrecoverable
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### Branches Impacted and Branch Nonrecovery Estimate

SS release terminated	1.0	Atmospheric dump valve failed to close from control room and is not closed locally for 22 min
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### Plant Models Utilized

PWR plant Class G

Event Identifier: 318/86-006

# CONDITIONAL CORE DAMAGE PROBABILITY CALCULATIONS

Event Identifier: 318/86-006  
 Event Description: Trip and One ASD Valve Fails to Close  
 Event Date: 9/5/86  
 Plant: Calvert Cliffs 2

## INITIATING EVENT

## NON-RECOVERABLE INITIATING EVENT PROBABILITIES

TRANS	1.0E+00
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## SEQUENCE CONDITIONAL PROBABILITY SUMS

End State/Initiator	Probability
CV	
TRANS	2.5E-04
Total	2.5E-04
CD	
TRANS	1.8E-06
Total	1.8E-06
ATWS	
TRANS	3.4E-05
Total	3.4E-05

## DOMINANT SEQUENCES

End State: CV	Conditional Probability:	2.4E-04
104 TRANS -RT -AFW -PORV.OR.SRV.CHALL SS.RELEAS.TERM HPI		
End State: CD	Conditional Probability:	1.6E-06
102 TRANS -RT -AFW PORV.OR.SRV.CHALL PORV.OR.SRV.RESEAT -HPI HPR/-HPI		
End State: ATWS	Conditional Probability:	3.4E-05

Event Identifier: 318/86-006

121 TRANS RT

# SEQUENCE CONDITIONAL PROBABILITIES

	Sequence	End State	Prob	N Rec**
101	TRANS -RT -AFW PORV.DR.SRV.CHALL -PORV.DR.SRV.RESEAT SS.RELE AS.TERM HPI	CV	1.0E-05	8.4E-01
102	TRANS -RT -AFW PORV.DR.SRV.CHALL PORV.DR.SRV.RESEAT -HPI HP R/-HPI	CD	1.6E-06 *	5.0E-02
104	TRANS -RT -AFW -PORV.DR.SRV.CHALL SS.RELEAS.TERM HPI	CV	2.4E-04 *	8.4E-01
116	TRANS -RT AFW MFW -HPI(F/B) HPR/-HPI -SS.DEPRESS COND/MFW	CD	8.5E-08	3.0E-02
119	TRANS -RT AFW MFW HPI(F/B) -SS.DEPRESS COND/MFW	CD	8.9E-08	2.5E-02
121	TRANS RT	ATWS	3.4E-05 *	1.2E-01

\* dominant sequence for end state

\*\* non-recovery credit for edited case

SEQUENCE MODEL: c:\asp\newmodel\pwrqtree.cmp

BRANCH MODEL: c:\asp\newmodel\calvert.txt

PROBABILITY FILE: c:\asp\newmodel\pwr\_b.pro

No Recovery Limit

## BRANCH FREQUENCIES/PROBABILITIES

Branch	System	Non-Recov	Opr Fail
TRANS	4.8E-04	1.0E+00	
LOOP	4.6E-06	3.9E-01	
LOCA	2.4E-06	4.3E-01	
RT	2.8E-04	1.2E-01	
RT/LOOP	0.0E+00	1.0E+00	
EMERG.POWER	5.4E-04	8.0E-01	
AFW	3.8E-04	2.6E-01	
AFW/EMERG.POWER	5.0E-02	3.4E-01	
MFW	2.0E-01	3.4E-01	
PORV.DR.SRV.CHALL	4.0E-02	1.0E+00	
PORV.DR.SRV.RESEAT	2.0E-02	5.0E-02	
PORV.DR.SRV.RESEAT/EMERG.POWER	2.0E-02	1.0E+00	
SS.RELEAS.TERM	1.5E-02 > 1.0E+00	3.4E-01 > 1.0E+00	
Branch Model: 1.OF.1			
Train 1 Cond Prob:	1.5E-02 > Failed		
SS.RELEAS.TERM/-MFW	1.5E-02	3.4E-01	
SS.DEPRESS	3.6E-02	1.0E+00	
COND/MFW	1.0E+00	3.4E-01	
HPI	3.0E-04	8.4E-01	
HPI(F/B)	3.0E-04	8.4E-01	4.0E-02
PORV.OPEN	1.0E-02	1.0E+00	

Event Identifier: 318/86-006

NPR/-MPI  
CSR

1.5E-04  
2.0E-03

1.0E+00  
3.4E-01

\* branch model file  
\*\* forced

Austin  
09-11-1987  
12:32:37

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