

PRECURSOR DESCRIPTION SHEET

LER No.: 327/84-033
Event Description: Atmospheric Dump Valve Opens and Causes LOFW
Date of Event: May 11, 1984
Plant: Sequoyah 1

EVENT DESCRIPTION

Sequence

During a normal reactor startup on May 11, 1984, following a reactor trip on May 10, Unit 1 experienced another reactor trip. Just prior to the event that occurred at 1400 h CST, Unit 1 was in mode 1 (554°F, 2235 psig) at 21% reactor power with SG level controls in manual.

Atmospheric steam dump valve 1-FCV-1-107 spuriously opened, causing a swell of SG levels. This action resulted in a high-high level in SG 3 that caused a turbine trip and MFW isolation to all four SGs. The transient then resulted in shrink of SG levels, causing a reactor trip on low-low level in SG 2. All equipment and personnel responded as expected, and the unit stabilized at 547°F.

Corrective Action

Inspection revealed a broken repositioning linkage on atmospheric dump valve 1-FCV-1-107, allowing the valve to cycle erratically. The repositioning linkage was replaced, and the valve was returned to service.

Plant/Event Data

Systems Involved:

Atmospheric dump valve and MFW isolation

Components and Failure Modes Involved:

Atmospheric dump valve — opened spuriously in operation
MFW — isolated on demand

Component Unavailability Duration: NA

Plant Operating Mode: 1 (21% power)

Discovery Method: Operational event

Reactor Age: 3.9 years

Plant Type: PWR

Comments

None

Event Identifier: 327/84-033

MODELING CONSIDERATIONS AND DECISIONS

Initiators Modeled and Initiator Nonrecovery Estimate

Transient	1.0	No recovery
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Branches Impacted and Branch Nonrecovery Estimate

MFW	0.34	Recovery assumed locally at equipment
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Secondary-side release terminated	1.0	No recovery assumed because of damaged valve linkage
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Plant Models Utilized

PWR plant Class F

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CONDITIONAL CORE DAMAGE PROBABILITY CALCULATIONS

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 Plant: Sequoyah 1

INITIATING EVENT

NON-RECOVERABLE INITIATING EVENT PROBABILITIES

TRANS 1.0E+00

SEQUENCE CONDITIONAL PROBABILITY SUMS

End State/Initiator	Probability
CV	
TRANS	5.3E-04
Total	5.3E-04
CD	
TRANS	4.8E-06
Total	4.8E-06
ATWS	
TRANS	3.0E-05
Total	3.0E-05

DOMINANT SEQUENCES

End State: CV Conditional Probability: 5.0E-04

109 TRANS -RT -AFW -PORV.OR.SRV.CHALL SS.RELEAS.TERM HPI

End State: CD Conditional Probability: 1.6E-06

103 TRANS -RT -AFW PORV.OR.SRV.CHALL PORV.OR.SRV.RESEAT -HPI HPR/-HPI -SS.DEPRESS LPR/-HPI.HPR

End State: ATWS Conditional Probability: 3.0E-05

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128 TRANS RT

SEQUENCE CONDITIONAL PROBABILITIES

	Sequence	End State	Prob	N Rec**
101	TRANS -RT -AFW PORV.OR.SRV.CHALL -PORV.OR.SRV.RESEAT SS.RELEAS.TERM HPI	CV	2.1E-05	5.2E-01
103	TRANS -RT -AFW PORV.OR.SRV.CHALL PORV.OR.SRV.RESEAT -HPI HP R/-HPI -SS.DEPRESS LPR/-HPI.HPR	CD	1.6E-06 *	2.8E-02
104	TRANS -RT -AFW PORV.OR.SRV.CHALL PORV.OR.SRV.RESEAT -HPI HP R/-HPI SS.DEPRESS	CD	9.0E-08	2.8E-02
109	TRANS -RT -AFW -PORV.OR.SRV.CHALL SS.RELEAS.TERM HPI	CV	5.0E-04 *	5.2E-01
120	TRANS -RT AFW MFW -HPI(F/B) -HPR/-HPI PORV.OPEN -SS.DEPRESS COND/MFW	CD	2.8E-07	3.1E-02
123	TRANS -RT AFW MFW -HPI(F/B) HPR/-HPI -SS.DEPRESS COND/MFW	CD	1.2E-06	1.7E-02
124	TRANS -RT AFW MFW -HPI(F/B) HPR/-HPI SS.DEPRESS	CD	1.3E-07	5.1E-02
126	TRANS -RT AFW MFW HPI(F/B) -SS.DEPRESS COND/MFW	CD	1.2E-06	1.6E-02
127	TRANS -RT AFW MFW HPI(F/B) SS.DEPRESS	CD	1.4E-07	4.8E-02
128	TRANS RT	ATWS	3.0E-05 *	1.2E-01

* dominant sequence for end state

** non-recovery credit for edited case

MODEL: b:\PWRBTREE.CMP

DATA: b:\SEQUOPRO.CMP

No Recovery Limit

BRANCH FREQUENCIES/PROBABILITIES

Branch	System	Non-Recov	Opr Fail
TRANS	1.0E-03	1.0E+00	
LOOP	2.3E-05	3.4E-01	
LOCA	4.2E-06	3.4E-01	
RT	2.5E-04	1.2E-01	
RT/LOOP	0.0E+00	1.0E+00	
EMERG.POWER	2.9E-03	5.1E-01	
AFW	1.0E-03	2.7E-01	
AFW/EMERG.POWER	5.0E-02	3.4E-01	
MFW	2.0E-01 > 1.0E+00	3.4E-01	
Branch Model: 1.0F.1			
Train 1 Cond Prob:	2.0E-01 > Unavailable		
PORV.OR.SRV.CHALL	4.0E-02	1.0E+00	
PORV.OR.SRV.RESEAT	3.0E-02	5.0E-02	
PORV.OR.SRV.RESEAT/EMERG.POWER	3.0E-02	5.0E-02	
SS.RELEAS.TERM	1.5E-02 > 1.0E+00	3.4E-01 > 1.0E+00	
Branch Model: 1.0F.1			

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Train 1 Cond Prob: 1.5E-02 > Failed
SS.RELEAS.TERM/-MFW 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

HPI	1.0E-03	5.2E-01	
HPI(F/B)	1.0E-03	5.2E-01	4.0E-02
HPR/-HPI	3.0E-03	5.6E-01	4.0E-02
PORV.OPEN	1.0E-02	1.0E+00	
SS.DEPRESS	3.6E-02	1.0E+00	
COND/MFW	1.0E+00	3.4E-01	
LPI/HPI	1.0E-03	3.4E-01	
LPR/-HPI.HPR	6.7E-01	1.0E+00	
LPR/HPI	1.0E-03	1.0E+00	

*** forced

Minarick
04-12-1987
16:35:46

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