LER No.:   269/85-002
Event Description: Spurious Main Steam Intercept Valve Closure and Trip
Date of Event   January 22, 1985
Plant: Oconee 1

EVENT DESCRIPTION

Sequence

On January 22, 1985, at 0447 h, Oconee Unit 1 tripped from 100% full
power. The trip occurred when all six intercept valves closed for
unknown reasons, causing high turbine header pressure that resulted in
high RCS pressure. The reactor tripped on high RCS pressure ~5 s after
the intercept valves closed and main steam relief valves (MSRVs) opened
to relieve secondary side pressure. MSRVs No. 2 and No. 10 failed to
reseat until SG pressure had been reduced to 875 psig.

Two of six main steam valves that supply main steam to moisture
separator heaters were manually closed from the control room to help
control main steam header pressure. Because of previously identified
control problems, the other four valves had been placed in the open
position and could not be closed from the control room during the event.

Corrective Action

The immediate corrective action was to stabilize the unit at hot
shutdown conditions. Subsequent investigations found no problem or
reasons to explain the intercept valve closures. The unit was placed
back on-line at 100% power at 2330 h.

Plant/Event Data

Systems Involved:
   Turbine intercept valves (TIV) and steam relief

Components and Failure Modes Involved:
   Main steam intercept valves — spuriously closed during operation
   Two MSRVs — initially failed to reclose after opening
   Four of six main steam to moisture separator heater valves — failed
   to close

Component Unavailability Duration: NA
Plant Operating Mode: 100% power
Discovery Method: Operational event
Reactor Age: 11.8 years
Plant Type: PWR

Event Identifier: 269/85-002

Comments

MSRVs 2 and 10 have behaved similarly as documented in LER 269/84-006. See also LER 269/85-005 for a similar event. (Ref. LERs 84-006 and 85-005.)

MODELING CONSIDERATIONS AND DECISIONS

Initiators Modeled and Initiator Nonrecovery Estimate

Transient   1.0   Nonrecoverable

Branches Impacted and Branch Nonrecovery Estimate

Steam-side re-lease terminated	0.12	MSRVs reseated in the required period after reducing pressure from the control room
Steam-side re-lease terminated; given MFW success	0.12	Rationale for recovery estimate same as above

Plant Models Utilized

PWR plant Class D

CONDITIONAL CORE DAMAGE CALCULATIONS

LER Number: 269/85-002
Event Description: Spurious Main Steam Intercept Valve Closure and Trip
Event Date: 1/22/85
Plant: Oconee 1

INITIATING EVENT

NON-RECOVERABLE INITIATING EVENT PROBABILITIES

TRANS   1.000E+00

SEQUENCE CONDITIONAL PROBABILITY SUMS

End State/Initiator	Probability
CV	
TRANS	2.021E-05
Total	2.021E-05
CD	
TRANS	1.681E-06
Total	1.681E-06
ATWS	
TRANS	3.000E-05
Total	3.000E-05

DOMINANT SEQUENCES

End State: CV   Conditional Probability: 1.722E-05

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

End State: CD   Conditional Probability: 1.075E-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: 3.000E-05

128   TRANS RT

Event Identifier: 269/85-002

SEQUENCE CONDITIONAL PROBABILITIES

	Sequence	End State	Seq. Prob	Non-Recov**
101	TRANS -RT -AFW PORV.OR.SRV.CHALL -PORV.OR.SRV.RESEAT SS.RELE AS.TERM HPI	CV	1.496E-06	6.240E-02
102	TRANS -RT -AFW PORV.OR.SRV.CHALL PORV.OR.SRV.RESEAT -HPI HP R/-HPI -SS.DEPRESS -LPR/-HPI.HPR	CV	5.293E-07	2.964E-03
103	TRANS -RT -AFW PORV.OR.SRV.CHALL PORV.OR.SRV.RESEAT -HPI HP R/-HPI -SS.DEPRESS LPR/-HPI.HPR	CD	1.075E-06 *	2.964E-03
104	TRANS -RT -AFW PORV.OR.SRV.CHALL PORV.OR.SRV.RESEAT -HPI HP R/-HPI SS.DEPRESS	CD	5.989E-08	2.964E-03
109	TRANS -RT -AFW -PORV.OR.SRV.CHALL SS.RELEAS.TERM HPI	CV	1.722E-05 *	6.240E-02
123	TRANS -RT AFW MFW -HPI(F/B) HPR/-HPI -SS.DEPRESS COND/MFW	CD	2.451E-07	1.776E-03
126	TRANS -RT AFW MFW HPI(F/B) -SS.DEPRESS COND/MFW	CD	2.464E-07	1.302E-03
128	TRANS RT	ATWS	3.000E-05 *	1.200E-01

* dominant sequence for end state
** non-recovery credit for edited case

Note:

Conditional probability values are differential values which reflect the added risk due to failures associated with an event.
Parenthetical values indicate a reduction in risk compared to a similar period without the existing failures.

MODEL: b:pwrdtree.cmp
DATA: b:oconprob.cmp

No Recovery Limit

BRANCH FREQUENCIES/PROBABILITIES

Branch	System	Non-Recov	Opr Fail
TRANS	1.030E-03	1.000E+00	
LOOP	2.280E-05	3.400E-01	
LOCA	4.170E-06	3.400E-01	
RT	2.500E-04	1.200E-01	
RT/LOOP	0.000E+00	1.000E+00	
EMERG.POWER	1.000E-03	1.000E+00	
AFW	1.020E-03	2.700E-01	
AFW/EMERG.POWER	5.000E-02	3.400E-01	
MFW	2.000E-01	3.400E-01	
PORV.OR.SRV.CHALL	8.000E-02	1.000E+00	
PORV.OR.SRV.RESEAT	1.000E-02	5.000E-02	
PORV.OR.SRV.RESEAT/EMERG.POWER	1.000E-02	5.000E-02	
SS.RELEAS.TERM	1.500E-02 > 1.000E+00	3.400E-01 > 1.200E-01	
Branch Model: 1.OF.1			
Train 1 Cond Prob:	1.500E-02 > Failed		

Event Identifier: 269/85-002

SS.RELEAS.TERM/-MFW	1.500E-02 > 1.000E+00	3.400E-01 > 1.200E-01	
Branch Model: 1.0F.1			
Train 1 Cond Prob:	1.500E-02 > Failed		
HPI	3.000E-04	5.200E-01	
HPI(F/B)	3.000E-04	5.200E-01	4.000E-02
HPR/-HPI	3.000E-03	5.600E-01	4.000E-02
SS.DEPRESS	3.600E-02	1.000E+00	
COND/MFW	1.000E+00	3.400E-01	
LPI/HPI	2.000E-03	3.400E-01	
LPR/-HPI.HPR	6.700E-01	1.000E+00	
LPR/HPI	1.000E-03	1.000E+00	

forced

Austin
08-11-1986
17:43:02