

PRECURSOR DESCRIPTION SHEET

LER No.: 413/85-022
Event Description: Unavailability of Emergency Power
Date of Event: March 14, 1985
Plant: Catawba 1

EVENT DESCRIPTION

Sequence

On March 7, 1985, (DG) 1A was found to be inoperable because its control power batteries were placed on equalizing charge for 45 min. DG "B" was tested successfully; however, the operator noticed that two indicating lights were not lit. Thinking the bulbs were simply burned out, he did nothing at the time to replace them. After the test he replaced the bulbs and discovered a short circuit in the sockets. He was unaware that two breakers for the DG controls had tripped. He informed two supervisors, who mistakenly did not realize the breakers were off, and was instructed by them that he should merely check voltages and that the battery breakers were closed.

On March 12 the shift technical advisor observed a DG "1A" "bypass" light being on and put in a work request to check it out. On March 14 during a test of DG "1A," the DG tripped off because of partially clogged fuel filters and an open equalizing gage valve. DG "1B" was test-started and would not start. In addition, the operators had problems shutting down the autostart sequencer, which kept trying to start the DG. An inspection found the tripped breakers. Both DGs were unavailable.

Corrective Action

Repairs were made. Breakers were closed. Procedures were revised.

Plant/Event Data

Systems Involved:
Emergency power

Components and Failure Modes Involved:
Batteries — removed from service
Indicating lights — short circuited

Component Unavailability Duration: 10.5 d
Plant Operating Mode: 1 (30% power)
Discovery Method: Testing
Reactor Age: 0.2 year
Plant Type: PWR

Event Identifier: 413/85-022

Comments

None

MODELING CONSIDERATIONS AND DECISIONS

Initiators Modeled and Initiator Nonrecovery Estimate

LOOP (postulated Base case
event)

Branches Impacted and Branch Nonrecovery Estimate

Emergency power 0.34 Potential recovery locally

Plant Models Utilized

PWR plant Class F

Event Identifier: 413/85-022

CONDITIONAL CORE DAMAGE CALCULATIONS

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UNAVAILABILITY, DURATION= 252

NON-RECOVERABLE INITIATING EVENT PROBABILITIES

LOOP	1.954E-03
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SEQUENCE CONDITIONAL PROBABILITY SUMS

End State/Initiator	Probability
CV	
LOOP	3.305E-06
Total	3.305E-06
CD	
LOOP	1.123E-05
Total	1.123E-05
ATWS	
LOOP	0.000E+00
Total	0.000E+00

DOMINANT SEQUENCES

End State: CV	Conditional Probability: 3.174E-06
217 LOOP -RT/LOOP EMERG.POWER -AFW/EMERG.POWER -PORV.OR.SRV.CHALL SS.RELEAS.TERM	
End State: CD	Conditional Probability: 1.121E-05
218 LOOP -RT/LOOP EMERG.POWER AFW/EMERG.POWER	

SEQUENCE CONDITIONAL PROBABILITIES

Event Identifier: 413/85-022

	Sequence	End State	Seq. Prob	Non-Recov**
215	LOOP -RT/LOOP EMERG.POWER -AFW/EMERG.POWER PORV.OR.SRV.CHALL -PORV.OR.SRV.RESEAT/EMERG.POWER SS.RELEAS.TERM	CV	1.320E-07	3.880E-02
217	LOOP -RT/LOOP EMERG.POWER -AFW/EMERG.POWER -PORV.OR.SRV.CHALL SS.RELEAS.TERM	CV	3.174E-06 *	3.886E-02
218	LOOP -RT/LOOP EMERG.POWER AFW/EMERG.POWER	CD	1.121E-05 *	3.930E-02

* 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 observed failures. Parenthetical values indicate a reduction in risk compared to a similar period without the existing failures.

MODEL: b:pwrbtree.cmp
DATA: b:catampro.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	2.850E-03 > 1.000E+00	5.100E-01 > 3.400E-01	
Branch Model: 1.OF.2			
Train 1 Cond Prob:	5.000E-02 > Failed		
Train 2 Cond Prob:	5.700E-02 > Failed		
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	4.000E-02	1.000E+00	
PORV.OR.SRV.RESEAT	3.000E-02	5.000E-02	
PORV.OR.SRV.RESEAT/EMERG.POWER	3.000E-02	5.000E-02	
SS.RELEAS.TERM	1.500E-02	3.400E-01	
SS.RELEAS.TERM/-MFW	1.500E-02	3.400E-01	
HPI	1.000E-03	5.200E-01	
HPI(F/B)	1.000E-03	5.200E-01	4.000E-02
HPR/-HPI	3.000E-03	5.600E-01	4.000E-02
PORV.OPEN	1.000E-02	1.000E+00	
SS.DEPRESS	3.600E-02	1.000E+00	
COND/MFW	1.000E+00	3.400E-01	
LPI/HPI	1.000E-03	3.400E-01	
LPR/-HPI.HPR	6.700E-01	1.000E+00	
LPR/HPI	1.000E-03	1.000E+00	

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