

PRECURSOR DESCRIPTION SHEET

LER No.: Special Reports 482/87-015 R1 and -016 R1
 Event Description: Unavailability of DGs within a 9-d period
 Date of Event: 12/11/87
 Plant: Wolf Creek 1

EVENT DESCRIPTION

Sequence

On 12/11/87, with the plant shut down for refueling and DG A in the tenth hour of its yearly 24-h run, a fitting in its lube oil line cracked and caused excessive oil leakage. The DG was forced to be shut down. During subsequent maintenance, a problem with the mechanical governor was also corrected; a pin had sheared on the speed setting shaft. The governor was replaced but failed after 20 min testing. A second governor was installed and also failed after 20 min of testing. It was decided to rebuild the original governor, following which DG A passed its hot 24 h on 12/18/88. The governors had failed from excessive shaft loading.

On 12/19/88, DG B failed its operability test when it could not be synchronized to the bus. The cause of the failure was a result of the potential transformer fuse knives not inserting fully into the fuse tabs. This result caused an unstable voltage output. The circuit closing linkage was adjusted to provide sufficient force to insert the knives. The DG was returned to service on 12/22/88.

Corrective Action

Repairs were made.

Plant/Event Data

Systems Involved:

Emergency power

Components and Failure Modes Involved:

DGs fail in test

Component Unavailability Duration: 360 h (assumed)

Plant Operating Mode: 6 (0%)

Discovery Method: Testing

Reactor Age: 2.6 y

Plant Type: PWR

Comments

It has been assumed that these failures could have occurred at power.

Event Identifier: 482/SR87-015, 016(R1)

CONDITIONAL CORE DAMAGE PROBABILITY CALCULATIONS

Event Identifier: 482/87-015 R1 (special report)
 Event Description: Unavailability of DGs within a nine day period
 Event Date: 12/11/87
 Plant: Wolf Creek 1

UNAVAILABILITY, DURATION= 360

NON-RECOVERABLE INITIATING EVENT PROBABILITIES

LOOP 6.5E-04

SEQUENCE CONDITIONAL PROBABILITY SUMS

End State/Initiator Probability

CD

LOOP 1.2E-04

Total 1.2E-04

CV

LOOP 2.7E-06

Total 2.7E-06

ATWS

LOOP 0.0E+00

Total 0.0E+00

SEQUENCE CONDITIONAL PROBABILITIES (PROBABILITY ORDER)

Sequence	End State	Prob	N Rec**
217 loop -rt/loop EMERG.POWER ep.rec	CD	1.1E-04	6.6E-02
216 loop -rt/loop EMERG.POWER -ep.rec afw/emerg.power	CD	9.1E-06	1.1E-01
215 loop -rt/loop EMERG.POWER -ep.rec -afw/emerg.power -porv.or.srv .chall ss.releas.term	CV	2.6E-06	1.1E-01
213 loop -rt/loop EMERG.POWER -ep.rec -afw/emerg.power porv.or.srv .chall -porv.or.srv.reseat/emerg.power ss.releas.term	CV	1.1E-07	1.1E-01

** non-recovery credit for edited case

SEQUENCE CONDITIONAL PROBABILITIES (SEQUENCE ORDER)

Sequence	End State	Prob	N Rec**
213 loop -rt/loop EMERG.POWER -ep.rec -afw/emerg.power porv.or.srv .chall -porv.or.srv.reseat/emerg.power ss.releas.term	CV	1.1E-07	1.1E-01
215 loop -rt/loop EMERG.POWER -ep.rec -afw/emerg.power -porv.or.srv .chall ss.releas.term	CV	2.6E-06	1.1E-01
216 loop -rt/loop EMERG.POWER -ep.rec afw/emerg.power	CD	9.1E-06	1.1E-01
217 loop -rt/loop EMERG.POWER ep.rec	CD	1.1E-04	6.6E-02

** non-recovery credit for edited case

Note: For unavailabilities, 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.

SEQUENCE MODEL: c:\asp\newmodel\pwr_bnew.cmp
 BRANCH MODEL: c:\asp\newmodel\wolf.new
 PROBABILITY FILE: c:\asp\newmodel\pwr_bnew.pro

Event Identifier: 482/87-015 R1 (special report)

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	2.9E-03 > 1.0E+00	8.0E-01 > 1.0E+00	
Branch Model: 1.OF.2			
Train 1 Cond Prob:	5.0E-02 > Failed		
Train 2 Cond Prob:	5.7E-02 > Failed		
ep.rec	1.0E+00	1.7E-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.or.srv.chall	4.0E-02	1.0E+00	
porv.or.srv.reseat	2.0E-02	1.1E-02	
porv.or.srv.reseat/emerg.power	2.0E-02	1.0E+00	
ss.releas.term	1.5E-02	3.4E-01	
hpi	1.0E-03	8.4E-01	
hpi(f/b)	1.0E-03	8.4E-01	1.0E-02
hpr/-hpi	1.5E-04	1.0E+00	1.0E-03
porv.open	1.0E-02	1.0E+00	4.0E-04
ss.depress	3.6E-02	1.0E+00	
cond/mfw	1.0E+00	3.4E-01	1.0E-02
lpi/hpi	1.5E-04	3.4E-01	
lpr/-hpi.hpr	6.7E-01	1.0E+00	
lpr/hpi	1.5E-04	1.0E+00	

* branch model file
 ** forced

Minarick
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