

PRECURSOR DESCRIPTION SHEET

LER No.: 312/87-022
 Event Description: Emergency power system is unavailable
 Date of Event: 7/29/87
 Plant: Rancho Seco

EVENT DESCRIPTION

Sequence

During routine testing of DG A, leakage of cooling water was detected. The DG was removed from service to replace the cooling water pump, which had a leaking shaft seal. The seal retainer spring had failed. DG B was undergoing testing following modifications and was not available for service. Both DGs were unavailable for 19 h.

Corrective Action

The pump was replaced.

Plant/Event DataSystems Involved:

Emergency power

Components and Failure Modes Involved:

Pumps are unavailable

Component Unavailability Duration: 19 h

Plant Operating Mode: 5 (0%)

Discovery Method: Testing

Reactor Age: 13.0 y

Plant Type: PWR

Comments

It has been assumed for analysis purposes that this event could have occurred at power.

MODELING CONSIDERATION AND DECISIONS

Initiators Modeled and Initiator Nonrecovery Estimate

Postulated LOOP	Base case nonrecovery
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Branches Impacted and Branch Nonrecovery Estimate

EPS	1.0	No recovery
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Plant Models Utilized

PWR plant Class D

Event Identifier: 312/87-022

CONDITIONAL CORE DAMAGE PROBABILITY CALCULATIONS

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UNAVAILABILITY, DURATION= 19

NON-RECOVERABLE INITIATING EVENT PROBABILITIES

LOOP 3.4E-05

SEQUENCE CONDITIONAL PROBABILITY SUMS

End State/Initiator	Probability
CD	
LOOP	6.3E-06
Total	6.3E-06
CV	
LOOP	1.4E-07
Total	1.4E-07
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	5.8E-06	6.6E-02
216 loop -rt/loop EMERG.POWER -ep.rec afw/emerg.power	CD	4.8E-07	1.1E-01

** non-recovery credit for edited case

SEQUENCE CONDITIONAL PROBABILITIES (SEQUENCE ORDER)

Sequence	End State	Prob	N Rec**
216 loop -rt/loop EMERG.POWER -ep.rec afw/emerg.power	CD	4.8E-07	1.1E-01
217 loop -rt/loop EMERG.POWER ep.rec	CD	5.8E-06	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_dnew.cmp
 BRANCH MODEL: c:\asp\newmodel\rancho.new
 PROBABILITY FILE: c:\asp\newmodel\pwr_bnew.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	

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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 > Unavailable		
ep.rec	1.0E+00	1.7E-01	
afw	1.3E-03	2.6E-01	
afw/emerg.power	5.0E-02	3.4E-01	
mfw	2.0E-01	3.4E-01	
porv.or.srv.chall	8.0E-02	1.0E+00	
porv.or.srv.reseat	1.0E-02	1.1E-02	
porv.or.srv.reseat/emerg.power	1.0E-02	1.0E+00	
ss.releas.term	1.5E-02	3.4E-01	
hpi	3.0E-04	8.4E-01	
hpi(f/b)	3.0E-04	8.4E-01	1.0E-02
hpr/-hpi	1.5E-04	1.0E+00	1.0E-03
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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