

PRECURSOR DESCRIPTION SHEET

LER No.: 293/86-027  
Event Description: LOOP occurs due to winter storm  
Date of Event: November 19, 1986  
Plant: Pilgrim 1

EVENT DESCRIPTION

Sequence

While the reactor was shut down for refueling, an arcing of the high-voltage lines due to locally heavy ice and snow occurred at 0819 h during a severe winter storm. A loss of offsite power occurred when both transmission lines tripped off due to near-simultaneously detected faults. All safety systems responded as designed. Offsite power was restored at 1015 h when the two lines were reenergized. By 1128 h the switchyard was restored to service.

Corrective Action

An inspection revealed no damage to any system.

Plant/Event Data

Systems Involved:  
Electrical

Components and Failure Modes Involved:  
Offsite power — failed in operation

Component Unavailability Duration: NA  
Plant Operating Mode: 6 (0% power)  
Discovery Method: Operational  
Reactor Age: 14.4 years  
Plant Type: BWR

Comments

Given the circumstances, this event could have occurred at full power and is analyzed on this basis.

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MODELING CONSIDERATIONS AND DECISIONS

Initiators Modeled and Initiator Nonrecovery Estimate

LOOP                      0.12                      Backup power source available

Branches Impacted and Branch Nonrecovery Estimate

None

Plant Models Utilized

BWR plant Class C

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CONDITIONAL CORE DAMAGE PROBABILITY CALCULATIONS

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INITIATING EVENT

NON-RECOVERABLE INITIATING EVENT PROBABILITIES

LOOP 1.2E-01

SEQUENCE CONDITIONAL PROBABILITY SUMS

End State/Initiator	Probability
CV	
LOOP	3.3E-08
Total	3.3E-08
CD	
LOOP	7.7E-06
Total	7.7E-06
ATWS	
LOOP	2.2E-06
Total	2.2E-06

DOMINANT SEQUENCES

End State: CV Conditional Probability: 3.2E-08

226 LOOP -EMERG.POWER SCRAM -SLC.OR.RODS HPCI RCIC/TRANS.OR.LOOP -SRV.ADS -LPCS -RHR(SDC)

End State: CD Conditional Probability: 5.6E-06

201 LOOP -EMERG.POWER -SCRAM SRV.CHALL/LOOP.-SCRAM -SRV.CLOSE -HPCI RHR(SDC) RHR(SPCOOL)/-  
 LPCI.RHR(SDC) C.I.AND.V/RHR(SDC).RHR(SPCOOL)

End State: ATWS Conditional Probability: 2.1E-06

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240 LOOP -EMERG.POWER SCRAM SLC.OR.RODS

SEQUENCE CONDITIONAL PROBABILITIES

	Sequence	End State	Prob	N Rec**
201	LOOP -EMERG.POWER -SCRAM SRV.CHALL/LOOP.-SCRAM -SRV.CLOSE -HP CI RHR(SDC) RHR(SPCOOL)/-LPCI.RHR(SDC) C.I.AND.V/RHR(SD C).RHR(SPCOOL)	CD	5.6E-06 *	1.4E-02
208	LOOP -EMERG.POWER -SCRAM SRV.CHALL/LOOP.-SCRAM -SRV.CLOSE HP CI RCIC/TRANS.OR.LOOP CRD SRV.ADS	CD	2.1E-07	4.2E-02
215	LOOP -EMERG.POWER -SCRAM SRV.CHALL/LOOP.-SCRAM SRV.CLOSE HP CI RCIC/LOCA SRV.ADS	CD	1.4E-06	6.0E-02
226	LOOP -EMERG.POWER SCRAM -SLC.OR.RODS HPCI RCIC/TRANS.OR.LOO P -SRV.ADS -LPCS -RHR(SDC)	CV	3.2E-08 *	5.8E-02
240	LOOP -EMERG.POWER SCRAM SLC.OR.RODS	ATWS	2.1E-06 *	1.2E-01
243	LOOP EMERG.POWER -SCRAM SRV.CHALL/LOOP.-SCRAM -SRV.CLOSE HP CI RCIC/TRANS.OR.LOOP	CD	2.3E-07	4.7E-02
250	LOOP EMERG.POWER SCRAM	ATWS	9.6E-08	9.6E-02

\* dominant sequence for end state

\*\* non-recovery credit for edited case

SEQUENCE MODEL: c:\asp\newmodel\bwrctree.cmp  
BRANCH MODEL: c:\asp\newmodel\pilgrim.txt  
PROBABILITY FILE: c:\asp\newmodel\bwr\_c.pro

No Recovery Limit

BRANCH FREQUENCIES/PROBABILITIES

Branch	System	Non-Recov	Opr Fail
TRANS	8.6E-04	1.0E+00	
LOOP	1.7E-05 > 1.7E-05	3.2E-01 > 1.2E-01	
Branch Model: INITOR			
Initiator Freq:			
LOCA	3.3E-06	5.0E-01	
SCRAM	3.5E-04	1.0E+00	
SLC.OR.RODS	1.0E-02	1.0E+00	4.0E-02
PCS/TRANS	1.7E-01	1.0E+00	
PCS/LOCA	1.0E+00	1.0E+00	
SRV.CHALL/TRANS.-SCRAM	1.0E+00	1.0E+00	
SRV.CHALL/TRANS.SCRAM	1.0E+00	1.0E+00	
SRV.CHALL/LOOP.-SCRAM	1.0E+00	1.0E+00	
SRV.CHALL/LOOP.SCRAM	1.0E+00	1.0E+00	
SRV.CLOSE	1.3E-02	1.0E+00	
EMERG.POWER	2.9E-03	8.0E-01	

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FW/PCS.TRANS	2.9E-01	3.4E-01	
FW/PCS.LOCA	4.0E-02	3.4E-01	
HPCI	2.9E-02	7.0E-01	
RCIC/TRANS.OR.LOOP	6.0E-02	7.0E-01	
RCIC/LOCA	1.0E+00	1.0E+00	
CRD	1.0E-02	1.0E+00	4.0E-02
SRV.ADS	3.7E-03	7.1E-01	4.0E-02
COND/FW.PCS	1.0E+00	3.4E-01	
LPCS	3.0E-03	3.4E-01	
LPCI (RHR) /LPCS	1.0E-03	7.1E-01	
RHR SW/LPCS.LPCI.TRANS	5.0E-01	1.0E+00	4.0E-02
RHR SW/LPCS.LPCI.LOOP	5.0E-01	1.0E+00	4.0E-02
RHR SW/LPCS.LPCI.LOCA	5.0E-01	1.0E+00	4.0E-02
RHR (SDC)	2.1E-02	3.4E-01	
RHR (SDC) /-LPCI	2.0E-02	3.4E-01	
RHR (SDC) /LPCI	1.0E+00	1.0E+00	
RHR (SPCOOL) /-LPCI.RHR (SDC)	2.0E-02	1.0E+00	
RHR (SPCOOL) /LPCI.RHR (SDC)	5.2E-01	1.0E+00	
C.I.AND.V/RHR (SDC).RHR (SPCOOL)	1.0E+00	3.4E-01	

\* branch model file  
 \*\* forced

Minarick  
 02-24-1988  
 12:08:17

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