PRECURSOR DESCRIPTION SHEET

LER No.:   280/84-011
Event Description: Component Cooling Water Isolated from Charging Pumps
Date of Event: May 18, 1984
Plant: Surry 1

EVENT DESCRIPTION

Sequence

On May 18, 1984, with the unit at full power, operations personnel performing a system walkdown discovered that charging/SI pump CCW was isolated from the intermediate seal cooler 1-SW-E-1B and that SW was isolated from the intermediate seal cooler 1-SW-E-1A. This alignment isolated the charging system's intended heat sink.

A review of plant logs and operator interviews confirmed that both intermediate seal coolers were isolated during two separate events. The first event started May 16, 1984, at 2045 h, when the "B" cooler was improperly placed in service and "A" cooler was removed from service until 2125 h. The second event started at 2140 h on the same day when the "A" cooler was again removed from service with the "B" cooler remaining improperly valved-in. Both coolers were isolated for a total of 40 min during the first event and 32 h for the second event.

Corrective Action

The "B" intermediate seal cooler was placed in service; the "A" cooler, in standby.

Following this event, specific maintenance operating procedures were written to ensure control of removal and return to service of the intermediate seal coolers. Proper valve alignment will be verified weekly by inclusion on the engineered safeguards valve alignment checklist.

Plant/Event Data

Systems Involved:

CVCS, CCW system, and SW system

Event Identifier: 280/84-011

Components and Failure Modes Involved:
    Charging pump coolers 1-SW-E-1A and 1-SW-E-1B isolated.

Component Unavailability Duration: One, 40 min; two, 32 h
Plant Operating Mode: 1 (100% power)
Discovery Method: system walkdown
Reactor Age: 11.9 years
Plant Type: PWR

Comments

    See LER 280/83-052 (November 18, 1983) for a similar event.

MODELING CONSIDERATIONS AND DECISIONS

Initiators Modeled and Initiator Nonrecovery Estimate

Postulated tran-   Base case
 sient, LOOP,
 and small-break
 LOCA

Branches Impacted and Branch Nonrecovery Estimate

HPI   0.34   Recoverable with realignment of several
                                 valves

Bleed and feed   0.34   Recoverable with realignment of several
                                 valves

Plant Models Utilized

PWR plant Class A

Event Identifier: 280/84-011

Event Identifier: 280/84-011
Event Description: Component Cooling Water Isolated from Charging Pumps
Event Date: 5/18/84
Plant: Surry 1

UNAVAILABILITY, DURATION= 32.67

NON-RECOVERABLE INITIATING EVENT PROBABILITIES

TRANS   3.4E-02
LOOP   2.5E-04
LOCA   4.6E-05

SEQUENCE CONDITIONAL PROBABILITY SUMS

        End State/Initiator   Probability

CV

        TRANS   5.7E-05
        LOOP   4.4E-07
        LOCA   3.8E-06

        Total   6.2E-05

CD

        TRANS   3.7E-07
        LOOP   2.4E-08
        LOCA   1.1E-05

        Total   1.1E-05

ATWS

        TRANS   0.0E+00
        LOOP   0.0E+00
        LOCA   0.0E+00

        Total   0.0E+00

DOMINANT SEQUENCES

End State: CV   Conditional Probability: 5.5E-05

Event Identifier: 280/84-011

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

End State: CD   Conditional Probability: 1.0E-05

308   LOCA -RT -AFW HPI -SS.DEPRESS -LPI/HPI LPR/HPI

SEQUENCE CONDITIONAL PROBABILITIES

	Sequence	End State	Prob	N Rec**
101	TRANS -RT -AFW PORV.OR.SRV.CHALL -PORV.OR.SRV.RESEAT SS.RELE AS.TERM HPI	CV	2.3E-06	1.2E-01
112	TRANS -RT -AFW -PORV.OR.SRV.CHALL SS.RELEAS.TERM HPI	CV	5.5E-05 *	1.2E-01
307	LOCA -RT -AFW HPI -SS.DEPRESS -LPI/HPI -LPR/HPI	CV	5.0E-06	1.2E-01
308	LOCA -RT -AFW HPI -SS.DEPRESS -LPI/HPI LPR/HPI	CD	1.0E-05 *	1.2E-01
310	LOCA -RT -AFW HPI SS.DEPRESS	CD	5.6E-07	1.2E-01

 * dominant sequence for end state
** 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.

MODEL: b:\pwratree.cmp
DATA: b:\surrprob.cmp

No Recovery Limit

BRANCH FREQUENCIES/PROBABILITIES

Branch	System	Non-Recov	Opr Fail
TRANS	1.0E-03	1.0E+00	
LOOP	2.3E-05	3.4E-01	
LOCA	4.2E-06	3.4E-01	
RT	2.5E-04	1.2E-01	
RT/LOOP	0.0E+00	1.0E+00	
EP	5.4E-04	5.1E-01	
AFW	1.0E-03	2.7E-01	
AFW/EP	5.0E-02	3.4E-01	
MFW	1.9E-01	3.4E-01	
PORV.OR.SRV.CHALL	4.0E-02	1.0E+00	
PORV.OR.SRV.RESEAT	2.0E-02	5.0E-02	
SS.RELEAS.TERM	1.5E-02	3.4E-01	
SS.RELEAS.TERM/-MFW	1.5E-02	3.4E-01	
SS.DEPRESS	3.6E-02	1.0E+00	
COND/MFW	1.0E+00	3.4E-01	
HPI	2.3E-03 > 1.0E+00	5.2E-01 > 3.4E-01	

Event Identifier: 280/84-011

```
Branch Model:  1.OF.3+ser
   Train 1  Cond Prob:        1.0E-02 > Unavailable
   Train 2  Cond Prob:        1.0E-01 > Unavailable
   Train 3  Cond Prob:        3.0E-01 > Unavailable
   Serial Component Prob:     2.0E-03
HPI(F/B)                      2.3E-03 > 1.0E+00          5.2E-01 > 3.4E-01          4.0E-02
   Branch Model:  1.OF.3+ser+opr
   Train 1  Cond Prob:        1.0E-02 > Unavailable
   Train 2  Cond Prob:        1.0E-01 > Unavailable
   Train 3  Cond Prob:        3.0E-01 > Unavailable
   Serial Component Prob:     2.0E-03
PORV.OPEN                     1.0E-02                    1.0E+00
HPR/-HPI                      3.0E-03                    5.6E-01                    4.0E-02
CSR                           3.0E-03                    3.4E-01                    4.0E-02
LPI/HPI                       1.0E-03                    3.4E-01
LPR/-HPI                      2.0E-03                    1.0E+00
LPR/HPI                       6.7E-01                    1.0E+00

***  forced



Minarick
04-12-1987
17:13:08
```

Event Identifier: 280/84-011