NUCLEAR POWER BUSINESS UNIT
TRAINING JOB PERFORMANCE MEASURES

RESPOND TO A RCP MALFUNCTION

JPM P000.031COT
Revision 0 DRAFT
July 18, 2000
TOTAL REWRITE

K/A REFERENCE: 015/17AA1.07 (3.5/3.4)
(NUREG-1122)   015/17 AA1.22 (4.0/4.2)
                 015/17 AA2.01 (3.0/3.5)
                 015/17AA2.10 (3.7/3.7)

ALTERNATE PATH JPM   __X__   YES   _____   NO

PERFORMANCE CHECKLIST:

<u>SATISFACTORY</u> - **Properly performed critical step(s) and/or in sequence (if applicable)**

<u>UNSATISFACTORY</u> - **Improperly performed critical step(s) and/or out of sequence (if applicable)**

  __X__   **Procedure adequately addresses task elements.**
               Enter identifier here: __AOP-1B, Rev. 11_____

  _____   **Other document adequately describes necessary task elements.**
               Enter identifier here: _____

  __X__   **Task elements described as attached.**

DESIRED MODE OF EVALUATION: **APPLICABLE EVALUATION SETTING:**

SIMULATE/WALKTHROUGH _X_ **DISCUSSION**____**PERFORM** _X_ **IN-PLANT**_____ **CONTROL ROOM** __X__

VALIDATED TIME FOR COMPLETION: __15__   **MINUTES**

EXAMINEE _____ EVALUATOR _____

START TIME _____ FINISH TIME _____

PERFORMANCE ☐ SAT   ☐ UNSAT

JOB TITLE: ☐ AOT   ☒ COT   ☐ SRO   ☐ STA

TOOLS/EQUIPMENT/REFERENCES:

AOP-1B, Rev. 11, "Reactor Coolant Pump Malfunction."

TASK STANDARDS:

Diagnoses Number "1A" RCP seal failure resulting in a plant shutdown per OP-3A, "Normal Power Operation to Low Power Operation", and adjusts seal injection flow.

SIMULATOR INFORMATION:

These simulator codes cause an RCP 1A #1 seal failure with 5 gpm leakage.

TIME	FAIL	COMPONENT	OPTION	VALUE	RAMP	DELAY	ACT	COND
ALL MODES	IC-1	U1 100% U2 100%						
MODE I	SYS MAL	RCP1A	----	5	----	----	D	----

NOTE: If this JPM is performed on the simulator, the JPM administrator should only give cues that are not indicated on the simulator. If simulator indication is sufficient to indicate the completion of a step, the JPM administrator should not have to give a cue to the trainee to continue the evolution.

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

READ AND PROVIDE TO THE EXAMINEE

****

THIS SECTION IS READ ONCE FOR THE ENTIRE PACKAGE OF JPMS. IT IS NOT REQUIRED TO REVIEW THIS SECTION FOR EVERY JPM BEING PERFORMED IN THE PACKAGE. THE INITIAL CONDITIONS AND INITIATING CUE(S)/TASKS TO BE PERFORMED SHOULD BE READ AND THEN PROVIDED TO THE EXAMINEE.

> After I read you the initial conditions and initiating cue(s)/task to be performed for this JPM and provide you a copy of the same, you may review and begin. Once you have completed the task, indicate completion by handing back this form to the evaluator unless otherwise told.
>
> You may use any approved reference materials normally available including logs. Make all written reports, oral reports, and log entries as if the evolution is actually being performed.
>
> EOP Immediate Actions are required to be performed from memory. After completing immediate action steps without using the procedure, you may then use any approved reference materials.
>
> For all two and three-way communications, make your report to me, the JPM evaluator. I will reply to your reports with the statement, "acknowledge." All actions in the plant are to be simulated and all actions in the simulator will be performed. Ensure you make it clear to me, the evaluator, of all actions you are taking so that credit may be given for completing each step of the task.
>
> DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

****

INITIAL CONDITIONS:

You are the Unit 1 Control Operator.
Unit 1 Alarms:
1)   "1P-1A RCP No. 1 Seal Water Flow High or Low" 1C03 1D 3-2 (or as indicated on simulator.)
2)   "1P-1A or B RCP Labyrinth Seal ΔP Low" 1C03 1D 2-1 (or as indicated on simulator.)
Unit 1 RCP Seal Indications:
1)   RCP seal leakage flow is pegged high (or as indicated on simulator.)
2)   "A" RCP seal inlet temperature ~ 115 °F (or as indicated on simulator.)
3)   "A" RCP seal outlet temperature ~ 128 °F (or as indicated on simulator.)
Alarm Response Book has been referenced.

INITIATING CUE(S) / TASK TO BE PERFORMED (SIMULATED):

The DSS/DOS directs you to respond to the RCP malfunction per AOP-1B.

PERFORMANCE INFORMATION

NOTE: *CRITICAL STEPS ARE DENOTED WITH A "Y". FAILURE TO MEET THE STANDARDS FOR THIS ITEM CONSTITUTES FAILURE.*

START TIME _____	STEP/SEQUENCE/CRITICAL			SAT _____
	1	1	N	UNSAT _____

ELEMENT: Monitor foldout page criteria.

STANDARD: Review foldout page criteria upon entry into procedure and recognize continuous applicability.

CUE: If asked, #1 & #2 combined seal leakoff is 7 gpm.

COMMENTS:

	STEP/SEQUENCE/CRITICAL			SAT _____
	2	2	N	UNSAT _____

ELEMENT: Check RCP vibration alarm CLEAR (1C04 1C 1-5.)

STANDARD: RCP vibration alarm checked CLEAR.

CUE: RCP vibration alarm not lit (or as indicated on simulator.)

COMMENTS:

	STEP/SEQUENCE/CRITICAL			SAT _____
	3	3	N	UNSAT _____

ELEMENT: Check RCP 1TR-2001 alarm CLEAR (1C04 1C 3-10.)

STANDARD: RCP 1TR-2001 alarm checked CLEAR.

CUE: RCP 1TR-2001 alarms are not lit (or as indicated on simulator.)

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STEP	SEQUENCE	CRITICAL	SAT
4	4	N	UNSAT

ELEMENT: Check "P-1A **OR** B RCP UPPER **OR** LOWER SUMP OIL LEVEL HIGH-LOW" alarm CLEAR (1C04 1C 3-11.)

STANDARD: Alarm checked clear.

CUE: The alarm is not lit (or as indicated on simulator.)

COMMENTS:

STEP	SEQUENCE	CRITICAL	SAT
5	5	Y	UNSAT

ELEMENT: Check RCP #1A Seal Leakage >0.8 gpm (1FR-175.)

STANDARD: RCP #1A seal leakage checked on 1FR-175. Recognizes #1A RCP seal leakage > .8 gpm.

CUE: RCP #1A seal leakage >0.8 gpm (or as indicated on simulator).

COMMENTS:

STEP	SEQUENCE	CRITICAL	SAT
6	6	Y	UNSAT

ELEMENT: Check RCP #1A seal leakage <6 gpm (1FR-177.)

STANDARD: #1A RCP seal leakage checked on 1FR-177. Recognizes #1A RCP seal leakage > 6 gpm and proceeds to procedure Step RNO.

CUE: RCP #1A seal leakage flow pegged high (or as indicated on simulator.)

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	STEP/SEQUENCE/CRITICAL			SAT	_____
	7	7	Y	UNSAT	_____

ELEMENT: Complete the following:
- 1) Check if seal outlet temperature is rising (TI-181/TI-182).
- 2) Check if RCP #2 seal leakage >2 gpm.
  - a) RCDT level change >1 % in 3 1/2 minutes.
  - b) Standpipe level high/low alarm (1C03 1D 1-2 or 1D 1-3)

STANDARD: Verifies RCP # 1A seal outlet temperature is **NOT** rising and RCP #2 seal leakage < 2 gpm by verifying with PAB AO that RCDT level is STABLE and no standpipe level alarms exist on 1C03.

CUE:
- 1) Seal outlet temperature is 130 °F and steady (or as indicated on simulator.)
- 2) No. 2 seal leakage <2 gpm (or as indicated on simulator.)
  - a) **PAB AO reports that the RCDT level has not changed.**
  - b) No RCP standpipe High/Low alarms are lit (or as indicated on simulator.)

NOTE: *This is a continuous action step.*

COMMENTS:

	STEP/SEQUENCE/CRITICAL			SAT	_____
	8	8	Y	UNSAT	_____

ELEMENT: Check RCP seal cooling.
- 1) Labyrinth seal ΔP indicates >+20 inches (1PI-131).

STANDARD: RCP labyrinth seal ΔP checked > +20 inches. Recognizes ΔP < +20 inches. Proceeds to RNO.

CUE: Labyrinth seal ΔP indicates <+20 inches (or as indicated on simulator.)

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STEP/SEQUENCE/CRITICAL			SAT
9	9	N	UNSAT

ELEMENT: Adjust seal injection throttle valve, and charging flow control valves as necessary to establish a positive labyrinth seal DP. (1CV-300A and/or 1HC-142).

STANDARD:
1) CO adjusts HC-142 to establish a positive labyrinth seal ΔP and/or
2) PAB AO adjusts 1CV-300A to establish a positive labyrinth seal ΔP.

CUE: Positive labyrinth seal ΔP is indicated on 1PI-131 for 1A RCP (or as indicated on simulator).

NOTE: *This step requires adjustment only if lab seal ΔP is not positive, therefore the operator may not make any adjustments.*

COMMENTS:

STEP/SEQUENCE/CRITICAL			SAT
10	10	N	UNSAT

ELEMENT: Check thermal barrier cooling normal:
1) Thermal barrier outlet AOV open (1CV-761A & B) on 1C03.
2) RCP cooling water low flow alarm clear (1C03 1D 1-4 & 1-5).

STANDARD: Thermal barrier checked as above.

CUE:
1) 1CV-761A and 1CV-761B red lights on, green lights off (or as indicated on simulator.)
2) RCP cooling water Low Flow alarm is not lit (or as indicated on simulator.)

COMMENTS:

STEP/SEQUENCE/CRITICAL			SAT
11	11	N	UNSAT

ELEMENT: Check RCP component cooling return temperature alarm clear (1C03 1D 2-4)

STANDARD: RCP component cooling return temperature alarm checked clear on 1C03 1D 2-4.

CUE: Alarm is not lit (or as indicated on simulator).

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STEP/SEQUENCE/CRITICAL			SAT	
12	12	N	UNSAT	

ELEMENT: Check Fire Protection and Smoke detector panel alarm CLEAR (C01 B 4-2.)

STANDARD: C01 B 4-2 alarm is checked clear.

CUE: Alarm is not lit (or as indicated on simulator.)

NOTE: *This is a continuous step.*

COMMENTS:

STEP/SEQUENCE/CRITICAL			SAT	
13	13	N	UNSAT	

ELEMENT: Check RCP No. 2 seal indications:
1) "1P-1A RCP Standpipe Level High" alarm CLEAR (1C03 1D 1-2.)
2) "1P-1B RCP Standpipe Level High" alarm CLEAR (1C03 1D 1-3.)
3) RCDT level stable (PAB AO must report).
4) RCP No. 1 seal leakage flow has remained stable (1FR-175 & 1FR-177.)

STANDARD: No. 2 seal indications checked as above.

CUE:
1) Standpipe level alarm not lit (or as indicated on simulator.)
2) Standpipe level alarm not lit (or as indicated on simulator.)
3) **PAB AO reports Unit 1 RCDT level stable.**
4) Seal leakage has not changed (or as indicated on simulator.)

COMMENTS:

PERFORMANCE INFORMATION

NOTE: *CRITICAL STEPS ARE DENOTED WITH A "Y". FAILURE TO MEET THE STANDARDS FOR THIS ITEM CONSTITUTES FAILURE.*

	STEP/SEQUENCE/CRITICAL			SAT	
	14	14	N	UNSAT	

ELEMENT: Check RCP seal injection temperatures normal:
1)   VCT high temperature alarm CLEAR (1C04 1C 3-7.)
2)   VCT outlet temperature <130 °F (1TI-140.)

STANDARD: Seal injection temperatures checked normal as above.

CUE: 1)   VCT high temperature alarm not lit (or as indicated on simulator.)
2)   VCT outlet temperature is 115 °F (or as indicated on simulator.)

COMMENTS:

	STEP/SEQUENCE/CRITICAL			SAT	
	15	15	Y	UNSAT	

ELEMENT: Determine RCP seal status returned within limits:
1)   RCP No. 1 seal leakage <6 gpm.

STANDARD: Determine RCP seal status has not returned to normal and reference RNO actions.

CUE: 1)   RCP No. 1 seal leakage indication pegged high (or as indicated on simulator.)

COMMENTS:

PERFORMANCE INFORMATION

NOTE: *CRITICAL STEPS ARE DENOTED WITH A "Y". FAILURE TO MEET THE STANDARDS FOR THIS ITEM CONSTITUTES FAILURE.*

STEP	SEQUENCE	CRITICAL		
16	16	Y	SAT	_____
			UNSAT	_____

ELEMENT: Shutdown per OP-3A, "Normal Power Operation to Low Power Operation."

STANDARD: Shutdown requirement identified.

CUE: DSS/DOS acknowledges a shutdown per OP-3A is required and directs the CO to continue with Step 10 RNO.

COMMENTS:

STEP	SEQUENCE	CRITICAL		
17	17	Y	SAT	_____
			UNSAT	_____

ELEMENT: Adjust seal injection throttle valves and/or charging flow control valve as necessary to maintain seal injection flow greater than or equal to 9 gpm to 1A RCP.

STANDARD: Throttle closed on 1HC-142 on 1C04 and/or direct PAB AO to throttle open 1CV-300A until >9 gpm seal injection flow is indicated. Charging pump speed may also be adjusted.

CUE: If asked, the PAB AO reports seal injection flow is 7 gpm. After adjustment in made, PAB AO reports 10 gpm seal injection flow is established.

NOTE: *Terminate JPM after seal injection flow has been adjusted. If lab seal adjustment was made in JPM step #9, that step satisfies alternate path criteria and becomes a critical step vs. this step.*

COMMENTS:

TERMINATION CUE: This completes this JPM. **COMPLETION TIME:** _____