ML25030A197

Comment from Applicant
Docket #055-77392
RO Question #17
K/A 015AK1.02
Initial conditions:

- Unit 1 is at 100% reactor power.
- RCP seal injection flow is 10 gpm to each RCP.
- All RCP standpipes were last filled over two weeks ago.
- RCS pressure is 2220 psig.
- VCT pressure is 20 psig.
- Seal injection temperature is 90 °F and stable.

Current conditions:

- ALB08-C05 RCP 3 CONTROLLED LKG HI/LO FLOW is received.
- RCP #3, No. 1 seal leakoff is 5.6 gpm.
- RCP #3 vibration levels are normal and stable.
- RCDT level is stable.

Which one of the following completes the following statement?
RCP #3, seal __(1)__ has failed, and per 13003-1, "Reactor Coolant Pump Operation," RCP #3 __(2)__ required to be immediately shutdown.

	__(1)__	__(2)__
A.	No. 2	is NOT
B.	No. 2	is
C.	No. 1	is NOT
D.	No. 1	is

The two-part question first asked which RCP #3 Seal failed, which I correctly identified as the #1 Seal.

The second part of the question asked per 13003-1, "RCP operation", RCP #3 is/is not required to be immediately shutdown.

I recognized the RCP needed to be shutdown per 13003-1 Section 4.2.1.4. However, in that section prior to Stopping the RCP, you must first trip the reactor due to being above 15% power. The stem of the question gave me the power level which led me to think the question was asking what is the first action to take; Trip the reactor or stop the RCP? Power level less than 15% directs you to trip the RCP first, however, the given power level of 100% requires first tripping the reactor. The word *immediately* led me to think the question was asking what the first physical action is to be performed. I realized due to the leak off being

greater 5.5gpm the RCP would need to be stopped; however, the reactor must first be tripped.

Based on the wording of the question along with the given conditions the correct choice would be "C". I didn't interpret the statement "immediately Stopping the RCP" as the Section, but the Immediate physical action. See the attached document which gives the correct order of steps to be taken based on the power level.

Licensee Recommendation
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Analysis:

The question consists of two parts. The first part correctly identified the RCP #3 No. 1 seal as failed. The second part asked whether RCP #3 needs to be immediately shutdown according to 13003-1, "RCP Operation."

There are no issues with the first part of the question.

The phrase "immediately shutdown" can be interpreted as asking for the first physical action to be performed. With a leak-off rate greater than 5.5 gpm, it is clear that the RCP needs to be stopped, but the reactor must be tripped first and the RCP shutdown 'is not' the first physical action performed.

Interpretation:

The phrase "immediately stopping the RCP" could be misleading. The word "immediately" might suggest the first physical action to be performed. However, the correct procedure involves multiple steps before the RCP can be stopped.

Supporting Documentation:

- **13003-1 Reactor Coolant Pump Operation Figure 1** states "IMMEDIATELY STOP RCP PER 4.2.1.4," and should be interpreted to immediately go to the section for securing the RCP. Section 4.2.1.4 does not require an immediate physical shutdown of the RCP. Instead, it outlines a series of steps:
    - Shift Supervisor permission.
    - Start the oil lift pump.
    - Trip the reactor.
    - Perform the immediate operator actions of 19000-1, E-0 Reactor Trip or Safety Injection.
    - Finally, stop the RCP.

- **13003-1 Reactor Coolant Pump Operation** section Limitations 2.2.10 list severe conditions to stop RCP. The section directs RCP shall be stopped but does not direct immediately. RCP seal leakoff flow is not included in the list.
    - An RCP shall be stopped if any of the following conditions exist:
        - Motor bearing temperature exceeds 195°F.
        - Motor stator winding temperature exceeds 311°F.
        - Seal water inlet temperature exceeds 230°F
        - Total loss of ACCW for a duration of 10 minutes.
        - RCP shaft vibration of 20 mils or greater.
        - RCP frame vibration of 5 mils or greater.
        - Differential pressure across the number 1 seal of less than 200 psid.
        - After a loss of RCP Seal Cooling (ACCW and Seal Injection), trip affected RCP prior to exceeding required "Operator Response Time" per Attachment 1.
- **NMP-AP-005 Transient Response Guidelines**: Defines Immediate Operator Actions (IOAs) and Prompt Operator Actions, neither of which include securing an RCP without following the procedural steps.
    - **Immediate Operator Actions (IOAs)**: Defined actions that must be performed expeditiously without reference to the Transient Response Procedure, applicable only in certain critical scenarios:
        - 19000, E-0 Reactor Trip or Safety Injection
        - 19100, ECA-0.0 Loss of all AC Power
        - 19211, FR-S.1 Response to Nuclear Power Generation / ATWT
    - **Prompt Operator Actions**: Actions that require procedure in hand and do not require the Shift Supervisor's permission, unlike securing an RCP, which does require such permission.

Conclusion:

Based on the conditions provided and the wording of the question, the correct choice is "C." The term "immediately" should be interpreted in the context of the physical actions performed. The operator must first obtain permission, start lift oil pump, and trip the reactor before stopping the RCP, as specified by the procedure. Therefore, choice "C" accurately reflects the correct answer of RCP 'is not' required to be immediately shutdown.

4.2.1 Pump Operation With A Seal Abnormality (continued)

4. WHEN directed by the SS,
THEN
Perform an RCP shutdown as follows:

NOTE
If RCP Oil Lift Pump is NOT available, shutdown of RCP may still proceed.

CAUTION
The Oil Lift pump should NOT be started for any RCP that is being stopped due to loss of thermal barrier cooling.

a. **Start** the RCP Oil Lift Pump for affected RCP, if available.

b. IF Reactor Power is greater than 15% Rated Thermal Power
THEN
Perform the following:

(1) **Trip** the Reactor
AND
Initiate 19000-1, E-0 Reactor Trip or Safety Injection.

(2) WHEN the immediate operator actions of 19000-1, E-0 Reactor Trip or Safety Injection are complete,
THEN
Go to Section 4.2.1 Step 4.d.

c. IF Reactor Power is less than 15% Rated Thermal Power,
THEN
Initiate 18005-C, Partial Loss of Flow.

d. **Stop** the RCP by
Placing the RCP Non-1E Control Switch in STOP
AND
Placing the RCP 1E Control Switch in STOP:

RCP	Non-1E Control Switch	1E Control Switch
Loop 1	1-HS-0495B	1-HS-0495A
Loop 2	1-HS-0496B	1-HS-0496A
Loop 3	1-HS-0497B	1-HS-0497A
Loop 4	1-HS-0498B	1-HS-0498A

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FIGURE 1
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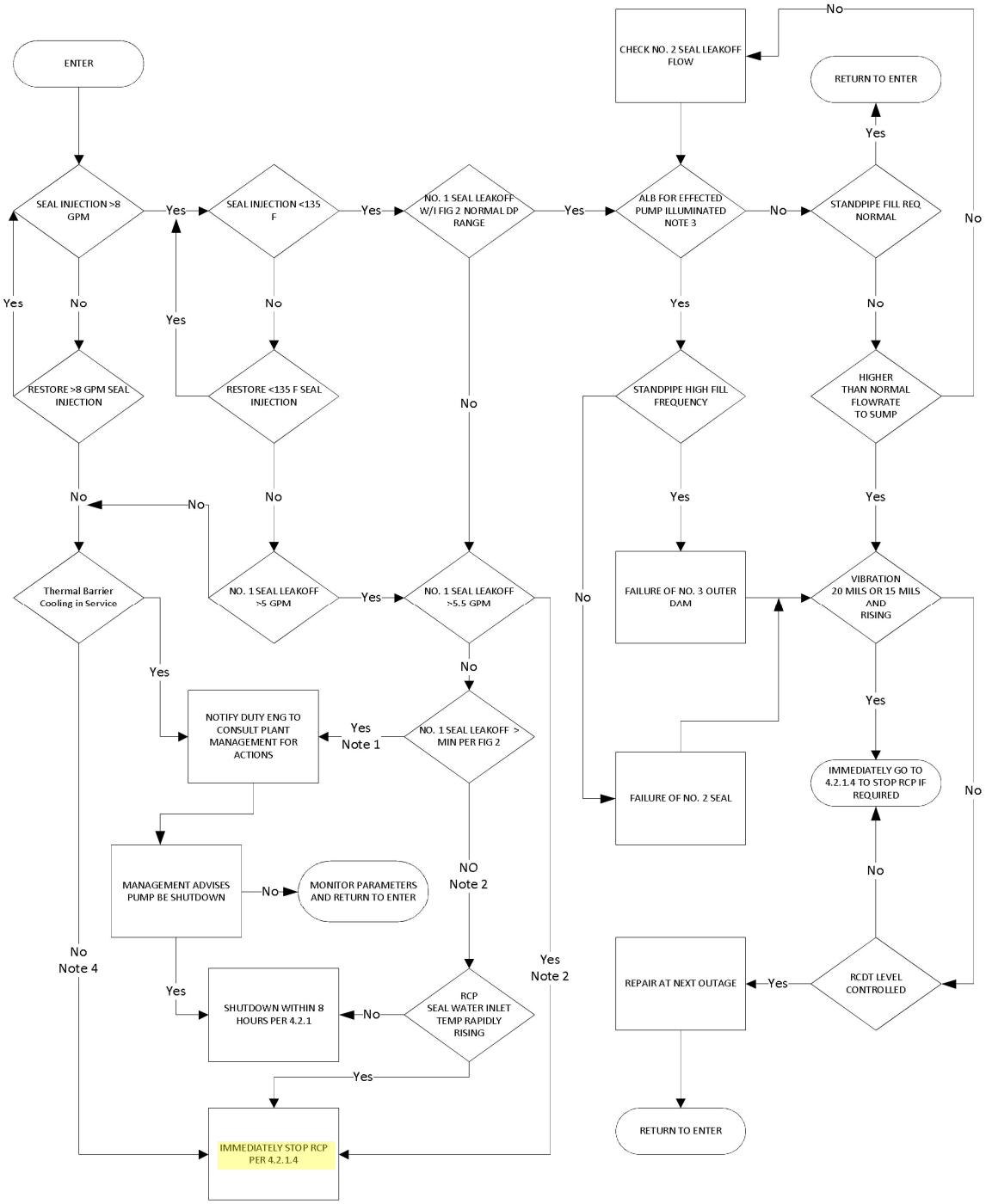
RCP SEAL ABNORMALITIES DECISION TREE



Note 1: Abnormal Operating Range of Figure 2
Note 2: Non-operating Range of Figure 2
Note 3: ALB08 A-04, B-04, C-04 or D-04
Note 4: Trip Affected RCP's prior to "Operator Response Time" when Seal Injection and Thermal Barrier cooling is lost.

1.0 PURPOSE / APPLICABILITY

1.1 PURPOSE

This procedure provides guidance and strategies for proper use of Transient Response Procedures (TRPs).

1.2 APPLICABILITY

This procedure is applicable to Farley, Hatch, Vogtle 1/2, and Vogtle 3/4.

For Hatch Section 4.4 is not applicable.

Applicability Determinations are not required for Category 2 NMPs, including initial version 1.0. This procedure is exempt from the 10 CFR 50.59c(4) process per NMP-AP-001-001, Review and Approval of Nuclear Management Procedures

2.0 DEFINITIONS

1. Immediate Operator Actions (IOAs) - actions which must be performed expeditiously by the user without reference to the Transient Response Procedure.

2. Response Not Obtained (RNO) – Procedure steps that parallel the ACTION/EXPECTED RESPONSE steps and provide operator guidance when the expected plant response specified is not obtained.

3.0 RESPONSIBILITIES

None

4.3 TRANSIENT RESPONSE USE (continued)

11. Prompt Operator Action (Farley and Vogtle 1&2)

a. There are certain plant transients that require prompt operator action to mitigate the effects. When it is determined that prompt operator action is required, communication will take place indicating action will be taken utilizing the appropriate hardcard. This communication may be included with or in lieu of traditional annunciator response communications. Verbalization of individual actions is not required. Place-keeping is not required. Upon completion of hardcard actions, or when the transient's effects are minimized, the procedure referenced in the hardcard will be entered and actions taken will be verified using the referenced procedure

Example communication (for Farley, reference NMP-AP-005-GL03 for Vogtle 1&2):

- OATC: SS, the one-alpha charging pump has tripped, taking prompt actions of AOP-sixteen
- OATC: SS, prompt actions of AOP-sixteen complete
- SS: prompt actions AOP-sixteen complete
- OATC: that is correct

4.3 TRANSIENT RESPONSE USE (continued)

4. Step Sequence variations are permitted for TRPs include:

   a. Immediate Operator Actions are actions which are:

      (1) First, performed from memory without interruption, or placekeeping requirements.

      (2) Afterwards are ensured using the procedure and place-keeping tools to check successful completion of the actions.

   b. Fold-Out page actions, when they become applicable, are performed without delay upon satisfying the criteria to initiate them, unless otherwise directed by the procedure for which they apply.

   c. Continuously Applicable steps (e.g. WHEN/THEN, monitor, or otherwise marked steps), ONCE encountered become applicable and remain applicable until differing guidance is provided. WHEN the condition of these steps is satisfied, the crew will implement the steps at the earliest opportunity, which does NOT interfere with a critical mitigation strategy.

   d. Early Operator Actions

      (1) Operators may take early operator action using site specific direction that mitigate the consequence of the event but do not interfere with recovery strategies.

      (2) The Shift Supervisor will be notified prior to the commencement of early operator actions.

      (3) Unless otherwise permitted to be performed from memory, applicable procedures/steps will be referenced when performing actions out of sequence.

   e. Manual Operator Actions

      (1) Operators may take early action to initiate ESF functions manually, from memory, before the setpoint is reached or prior to procedural direction to do so as a function of their License.

   f. BWR EOP Flowpaths

      (1) Refer to 30AC-OPS-013-0; Regardless of the entry condition, the action of the individual guielines must be performed concurrently. The Shift Supervisor will prioritize the actions within the simultaneously applicable EOP actions based on plant conditions.