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FPL

December 22, 2009

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USNRC Chief Examiner, Region II
U.S. Nuclear Regulatory Commission
Atlanta Federal Center
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Subject: Post NRC Written Exam Facility Comments

In accordance with Operator Licensing Examination Standards for Power Reactors, NUREG-1021 Rev. 9, Supplement 1, ES-402 and ES-501, Florida Power & Light St. Lucie Nuclear Plant is submitting the HLC-19 NRC Written Exam post exam facility comments.

Specific items provided per those requirements are:

- Attachment 1 – St. Lucie Applicant NRC Written Exam Comments with Facility Review

Questions or comments should be directed to Terry Benton at (772) 467-7380, or Dave Lanyi at (772) 467-7364 (office) or (772) 532-0106 (cell).

Sincerely,

Mike Baughman
Acting Training Manager, St. Lucie Nuclear Power Station

Question #23
Applicant [redacted]ubmitted:

A Steam Generator Tube Rupture has occurred on 1B S/G with the following plant conditions:

- 1 RCP in each loop is running
- T-avg is 475F
- 1B S/G isolation is complete
- 1B S/G pressure is 840 psia

RCS depressurization is to be performed in accordance with 1-EOP-04, "Steam Generator Tube Rupture".
The RCS pressure band should be __(1)__ to: __(2)__

A. 1) 790 – 890 psia;
2) meet RCP seal requirements AND to minimize RCS leakage into the S/G.

B. 1) 790 – 890 psia;
2) allow control of ruptured S/G level while minimizing dilution AND to minimize RCS leakage into the S/G.

C. 1) 840 – 890 psia;
2) meet RCP seal requirements AND to prevent lifting a secondary safety valve.

D. 1) 840 – 890 psia;
2) allow control of ruptured S/G level while minimizing dilution AND to prevent lifting a secondary safety valve.

Comment: The candidate is required to identify the RCS depressurization strategy in 1-EOP-04, "Steam Generator Tube Rupture." The approved answer is "B." Answer "D" should also be correct.

Choice D is also correct because controlling RCS pressure between 840 - 890 psia is within 50 psia of the stated S/G pressure of 840 psia as listed in the stem of the question, and is consistent with the step 11 of 1-EOP-04 (page 11) which states:
"PERFORM a controlled RCS depressurization as follows:
A. MAINTAIN RCS pressure within ALL the following criteria (listed in order of priority):

- Within the limits of Figure 1A, RCS Pressure Temperature
- Less than 930 psia
- Above the minimum pressure for RCP operation
- **Approximately equal to the most affected S/G pressure (within 50 psia)**

Additionally, the second half of choice D is also correct per CEN 152 Interim Change 5.4, page B6-26, as discussed below (see specific bolded text).

The general goals associated with RCS pressure control are: providing subcooling to support the core heat removal process, avoiding overpressure situations for PTS and RT NDT considerations, minimizing the pressure differential between the steam generator and the RCS in SGTRs to minimize the leakage, deliberately creating a primary to secondary differential pressure to establish backflow to control SG level rise or reduce SG pressure/temperature, **and controlling RCS pressure below the main steam safety valve (MSSV) lift pressure to prevent uncontrolled release of radioactivity to the environment.**

References:

A. 1-EOP-04, step 11 page 11.
B. CEN 152 Interim Change 5.4

FPL Utility Position:
Answer D is also correct based on Step 11 of 1-EOP-04 for RCS pressure band and the bases from CEN 152 Interim Change 5.4, page B6-26,

The controlled RCS Pressure for Answer D is 840 to 890 psia which meets all requirements of the 1-EOP-4 step 11 for RCS depressurization and the second part of Answer D is directly stated in CEN 152.

There are two correct answers for this question, Choice B and Choice D.

Choice A and Choice C are incorrect due to meeting RCP seal requirements is not a basis for this procedurally directed action.

Question 23

4.0 OPERATOR ACTIONS (continued)

INSTRUCTIONS **CONTINGENCY ACTIONS**

NOTE

RCP operation is desirable while depressurizing the RCS during a SGTR event.

- RCP operation takes precedence over equalizing primary and secondary pressures.
- Monitor RCPs for cavitation as the NPSH curve is approached and exceeded.
- Maintain minimum subcooling within the limits of Figure 1A.

[*] **11. Depressurize the RCS**

* PERFORM a controlled RCS depressurization as follows:

A. MAINTAIN RCS pressure within **ALL** the following criteria (listed in order of priority):

- Within the limits of Figure 1A, RCS Pressure Temperature
- Less than 930 psia
- Above the minimum pressure for RCP operation
- * Approximately equal to the most affected S/G pressure (within 50 psia)

B. OPERATE Main or Auxiliary Pressurizer spray.

C. If HPSI throttle criteria are met, Then THROTTLE SI flow. **REFER TO** Appendix S, Safety Injection Throttling and Restoration.

11.1 If RCS pressure can NOT be LOWERED and MAINTAINED within the specified criteria, Then OPERATE the PORVs or RCGVS to reduce pressure.

Steam Generator Tube Rupture Recovery Bases

Step Number 9 Lower and Control RCS Pressure

Intent

The intent of this step is to establish control of RCS pressure.

The general goals associated with RCS pressure control are: providing subcooling to support the core heat removal process, avoiding overpressure situations for PTS and RT NDT considerations, minimizing the pressure differential between the steam generator and the RCS in SGTRs to minimize the leakage, deliberately creating a primary to secondary differential pressure to establish backflow to control SG level rise or reduce SG pressure/temperature, and controlling RCS pressure below the main steam safety valve (MSSV) lift pressure to prevent uncontrolled release of radioactivity to the environment.

Method

Pressurizer pressure may be reduced by any of the following:

1. Operation of Pressurizer sprays and heaters.
2. Control of charging pumps, letdown and HPSI pumps (if HPSI Stop/Throttle criteria are met).
3. As a last resort, by operating the [PORV(s) or pressurizer vent(s)]. This method would likely be chosen in the event that main and auxiliary pressurizer spray are not available and it is necessary to lower pressurizer pressure. Pressure control by this method requires close operator attention, because the resultant pressure decrease when the PORV(s) is opened can be dramatic. In addition, the operator must closely monitor RCS inventory control and pressure/ temperature conditions in the RDT/containment while utilizing this method.

Maintaining the RCS pressure within the PT limits and approximately equal to the isolated steam generator pressure [±50 psi] and below the [lowest MSSV lift setpoint] will minimize the loss of primary fluid to the secondary side and the possibility of overfilling the isolated SG. This action will minimize the potential for release of radiation to the environment by minimizing RCS to steam generator leakage.

Maintaining RCS pressure approximately equal to or less than the affected SG pressure allows for the backflow of secondary water into the RCS which provides several operational benefits. These benefits include:

1. SG level can be maintained within the indicating range,
2. by controlling SG level, the probability of filling the main steam piping with water is greatly reduced,
3. use of the blowdown system for SG level control can be minimized, thus minimizing contamination of the secondary
4. depressurization of the isolated SG can be performed without steaming to the condenser or to the atmosphere,
5. less secondary makeup water is required for the RCS cooldown.

(continue)

Question #42.
Applicant [redacted] submitted:

Unit 1 is at 100% power when a rupture in the 1A CCW header occurs. The crew has entered 1-0310030, "Component Cooling Water Off Normal Operation".

As a result of the actions carried out in the above procedure,

1) how has Containment Cooling been compromised?
2) what actions must be taken within 45 minutes if Containment temperature can not be reduced to less than or equal to 120°F?

A. 1) Partial loss of CCW flow to the A and B Containment Coolers.
2) Initiate a Reactor trip and carry out EOP-01, "Standard Post Trip Actions."

B. 1) Partial loss of CCW flow to the A and B Containment Coolers.
2) Perform a down power IAW 2-ONP-22.01, "Rapid Down Power."

C. 1) Total loss of CCW flow to the A and B Containment Coolers.
2) Initiate a Reactor trip and carry out EOP-01, "Standard Post Trip Actions."

D. 1) Total loss of CCW flow to the A and B Containment Coolers.
2) Perform a down power IAW 2-ONP-22.01, "Rapid Down Power."

Comment:
The candidate is required to identify the impact on containment cooling and the procedural directions based on containment temperature exceeding 120°F. The approved answer is "C." Answer "D" should also be correct.

Part one of the choices is the same for both "C" and "D". A loss of CCW on the 1A CCW header will result in a total loss of CCW flow to the 1A and 1B Containment coolers. This makes choices "A" and "B" incorrect.

Part two of the question requires the candidate to determine procedural actions that must be taken **WITHIN** 45 minutes if containment temperature can not be reduced to less than 120 °F.

Unit 1 procedure 1-ONP-25.01, "Loss of RCB Cooling Fans," contingency step 6.4.2.A requires a rapid downpower be performed if containment air temperature is greater than 120 °F and to trip the unit if temperature is not reduced **WITHIN** 45 minutes. Additionally, the caution statement on page 12 states "operator action is required **WITHIN** 45 minutes to restore air temperature to less than or equal to 120 °F or initiate reactor trip and cooldown...."

The stem of the question is worded in a manner that an operator can determine actions at any point within the 45 minute limit or at the time containment temperature first exceeds 120 ° F.

Based on the operator's reference point, the direction taken per the ONP would be different:

1) Perform a rapid down power, once containment temperature exceeds 120°F (time 0), which is within the 45 minute time limit requiring a trip (answer D)

2) Trip the plant within 45 minutes if containment temperature cannot be reduced to < 120°F (answer C)

The contingency action to commence a rapid down power is not discretionary; it must be taken and would be, within 45 minutes of containment temperature being > 120°F. There are two correct answers for this question.

Reference: 1-ONP-25-01, "Loss of RCB Cooling Fans"

FPL Utility Position:

Answer D is also correct based on Step 6.4.2 contingency actions of 1-ONP-25.01 for Loss of Reactor Support Cooling and the caution preceding step 6.4.1 of the same procedure.

The question stem time frame is indeterminate for the exact point in time within the 45 minutes, therefore the candidate could assume one minute or forty-four minutes into the event. This would make both rapid downpower and reactor trip required if containment temperature is not reduced to less than 120°F during this time period, dependent upon the candidate's time reference.

There are two correct answers for this question, Choice C and Choice D.

A loss of CCW on the 1A CCW header will result in a total loss of CCW flow to the 1A and 1B Containment coolers. This makes choices "A" and "B" incorrect.

Question 42

6.4 Loss of Containment Fan Cooler

INSTRUCTIONS **CONTINGENCY ACTIONS**

CAUTION

- §1,2 Sufficient Containment Fan Coolers (HVS-1A, HVS-1B, HVS-1C and HVE-1D) are required to be in operation to maintain Containment air temperature less than or equal to 120°F. This is necessary to maintain the reactor vessel support structure within design basis. Operator action is required within 45 minutes, to restore air temperature to less than or equal to 120°F or initiate reactor trip and cooldown to at least Hot Shutdown. The total time from the loss of Containment Fan Coolers to Hot Shutdown is 5 hours.

- §3 If a running Containment Fan Cooler is stopped for reasons other than the monthly fan cooler surveillance, but is capable of starting on SIAS, Then the associated offsite power circuit is required to be declared inoperable. A Condition Report is required for Engineering to evaluate the conditions to determine offsite power operability status.

1. ATTEMPT one start of the Containment Fan Cooler.

1. If fan does NOT start, Then PERFORM the following:

A. PERFORM Appendix D, Containment Cooling Fan Local Breaker Operations.

B. ATTEMPT one start of all available Containment Fan Coolers.

C. If any fan does NOT start, Then NOTIFY the following:

- Maintenance Supervisor
- EM

D. REFER TO Tech Specs 3.6.2.1.

(Question 42)

Question 42

[redacted]

Question 51
Applicant [redacted] submitted:

Which ONE of the following Unit 1 process monitors, that if failed to perform its control function, could result in an UNMONITORED radioactive effluent release.

A. Letdown Process Monitor
B. Component Cooling Water Monitor
C. Steam Generator Blowdown Monitor
D. Condenser Air Ejector Monitor

Comment:

The candidate is required to identify the Unit 1 process monitor, that if it failed to perform its **control function'** could result in an **UNMONITORED** effluent release path. The approved answer is "B" (CCW monitor). Choice "C" (S/G Blowdown monitor) is also correct.

When the "A" or "B" SG Blowdown Rad monitor alarms, it closes FCV-23-3 and FCV-23-7 on the "A" side and FCV-23-5 and FCV-23-9 for the "B" side. This isolates SG blowdown process and sample flow.

If the SG Blowdown Rad Monitor failed to perform its **control function**, the blowdown process flow would continue its flow path to the Steam Generator Blowdown Treatment Facility to the in-service Monitor Storage Tank (MST) which is VENTED TO ATMOSPHERE. There is no RAD MONITOR in this flowpath/vent. This would be an **UNMONITORED** release.

Answers B and C both have control functions associated with these rad monitors and with a failure to perform the intended control function associated with these rad monitors, They both would have the **same end result of an unmonitored release**, as both tanks, the component cooling water surge tank and the monitor storage tank are **vented to the atmosphere.**

There are two correct answers for this question, Choice B and Choice C.

The Condenser Air Ejector and Letdown radiation monitors, do not have control functions. This makes choices "A" and "D" incorrect.

Reviewed:

Ops Training Supervisor — Date 12/21/09

Senior Reactor Operator — Date 12/21/09

Asst. Ops Manager — Date 12/22/09

4.2 Steam Generator Blowdown Monitors (continued)

INSTRUCTIONS **CONTINGENCY ACTIONS**

NOTE

- The only plant condition that will cause a valid HIGH alarm is a Primary to Secondary S/G tube leak.
- The S/G sample lines isolate on a HIGH alarm; therefore, the monitored sample will be from the stagnant fluid left in the piping and is NOT a valid indication of S/G activity.
- The Air Ejector process monitor may be a valid indication of S/G activity when the S/G Blowdown monitor is isolated.

3. If the affected monitor is functioning properly and indicates high activity, Then PERFORM the following:

A. NOTIFY Chemistry to implement COP-06.05, High Activity in a Steam Generator.

* **B.** If Channel 44 is alarmed, Then ENSURE the following:

- FCV-23-3 is CLOSED
- FCV-23-7 is CLOSED

* **C.** If Channel 45 is alarmed, Then ENSURE the following:

- FCV-23-5 is CLOSED
- FCV-23-9 is CLOSED

D. If Channel 44 and 45 are alarmed, Then CONSIDER the possibility of high background radiation in the vicinity of the detectors (S/G Blowdown Sampling Panel – Fan Room).

E. CHECK Channel 35, Condenser Air Ejector, to determine extent of leakage into the secondary system.