Duke Power

D.M. JAMIL
Vice President

Duke Power
Catawba Nuclear Station
4800 Concord Road / CN01VP
York, SC 29745-9635

803 831 4251

803 831 3221 fax

December 21, 2005

W. D. Travers, Regional Administrator
U. S. Nuclear Regulatory Commission, Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, GA 30303-8931

SUBJECT: Duke Energy Corporation
Catawba Nuclear Station, Unit 1 and 2
Docket Nos. 50-413 and 50-414
50-413/2005-301 and 50-414/2005-301
Post-Examination Documentation

The enclosed post-examination documentation is provided in accordance with NUREG-1021, Section 402 E.6. This post-examination documentation is associated with the Catawba Nuclear Station initial written licensing examinations administered the week of December 5, 2005.

If you have any questions or need additional information, please contact John Suptela at 803.831.5123.

Sincerely,

JW Putesa for

Dhiaa M. Jamil

KEN/s

xc: with attachments
J. H. Moorman III, Chief
Operating Licensing Branch
U. S. Nuclear Regulatory Commission
Sam Nunn Atlanta Federal Center
61 Forsythe Street, S.W., Suite 23T85
Atlanta, GA 30303-8931

without attachments
U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

E. F. Guthrie
Senior NRC Resident – Catawba
CN01NC

Catawba Nuclear Station 20th Anniversary 1985 - 2005

Question 78

BACKGROUND

This question was designed to test two knowledge elements:

1. The students' ability to recognize the basis for Tech Spec 3.9.4 LCO.
2. Determine the correct actions to be taken per Tech Specs in 1 hour or less given the conditions provided in the stem.

The question psychometrics were such that the first parts of A and C were correct, and the second parts of A and B were correct. Therefore, the correct answer based on the key and intended by the exam development team was A.

The stem does not address the status of 1B train of ND. The validators did not ask questions related to the status of 1B train of ND during question validation.

Without knowing the status of the 1B train of ND, either A or C could be correct. If 1B train of ND is assumed to be inoperable, then A is the correct answer. If 1B train of ND is assumed to be operable, then C is the correct answer. Based on other information related to plant conditions in the stem, the operability of 1B train cannot be determined since in this plant configuration, one train of equipment may not be operable; although it may be "available" (i.e. both offsite power and emergency D/G may not be aligned to the available essential bus).

CONCLUSION

By not addressing the condition of 1B train of ND, two possible answers could be correct depending on the status assumed for 1B train of ND. The stem provides enough information to narrow the correct answer to A or C, but does not provide enough information to select one over the other.

The facility recommends that answer A or C be accepted as correct for this question.

ATTACHED REFERENCES

Question 78 from the 2005 Catawba NRC initial license exam

Question: 05-78

1 Pt(s) Given the following conditions:

- Unit 1 in Mode 6
- Refueling cavity is filled to 23 feet.
- Core reload is in progress
- NC temperature is 145°F
- 1A residual heat removal (ND) train is in operation

A leak has been reported on the 1A ND pump motor cooler. To repair the leak, cooling flow to the motor cooler must be isolated. Maintenance estimates it will take 40 minutes to complete repairs.

What is the basis for having one ND loop in operation in this condition and how does this affect the ability to continue core reload?

A. Provides an indication of reactor coolant temperature.
Core reload must be stopped.

B. Ensures that a core Keff of less than or equal to 0.95 is maintained during fuel handling operations.
Core reload must be stopped.

C. Provide an indication of reactor coolant temperature.
Core reload may continue provided no operations are permitted that would dilute the refueling cavity boron concentration.

D. Ensures that a core Keff of less than or equal to 0.95 is maintained during fuel handling operations.
Core reload may continue provided no operations are permitted that would dilute the refueling cavity boron concentration.

Question 87

BACKGROUND

This question was designed to test two knowledge elements:

1. The action required per AP/1/A/5500/028 (Secondary Steam Leak) to address an atmospheric steam dump that is found open
2. The Tech Spec basis for the minimum temperature for criticality.

The question psychometrics were such that the first parts of A and C were correct, and the second parts of B, C, and D were correct. Therefore, the correct answer based on the key and intended by the exam development team was C.

The first portion of the stem of the question asks what action is taken per the AP to attempt to close the atmospheric dump. AP step 9.e reads as follows:

9. (Continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
e. Verify atmospheric dump valves - CLOSED.	e. Perform the following: 1) Select "OFF RESET" on the following switches: o "STEAM DUMP INTLK BYP TRN A" o "STEAM DUMP INTLK BYP TRN B". 2) **IF** valve will not close, **THEN** close affected atmospheric dump valve isolation valve. 3) **IF** isolation valve will not close, **THEN** dispatch operator to fail air to affected atmospheric dump valve.

Because the stem did not specify "first" action or similar wording, any action taken per the RNO column in step 9.e above is equally correct. Additionally, the words "attempt to close" imply that initial action may (or may not) be successful which strengthens the fact that any of the actions are correct.

It is evident that the students understood the intent of the procedure related to an open atmospheric dump valve at power (to isolate that steam flowpath). Based on post examination interviews with students, they believed that the first half of all four answers were correct. They interpreted the first part of answers B and D to mean that the steam dump valve was required to be isolated locally.

Their reasons for this determination were:

1. Interpretation of the first part of answers B and D to be equivalent to the wording and intent of 9.e.2) RNO since the step does not specifically address where this could be accomplished (control room versus locally).
2. Interpretation of the first part of answers B and D to be equivalent to the intent of 9.e.3) RNO since by closing the air supply the atmospheric dump, it should close. This is the only method by which this valve can be closed locally.

Either of these reasons alone was sufficient to confirm their belief. Given this, they then answered the question based on what they considered the "strongest" answer related to the basis for minimum temperature for criticality. All students picked either B or D.

CONCLUSION

The wording of the stem and the psychometrics of the question coupled with the student thought process (without procedural reference) would lead to answers B, C, and D being correct. Based on NUREG-1021 guidance, a question with no correct answer or more than 2 correct answers should be removed from the examination.

The facility recommends removal of this question from the examination.

ATTACHED REFERENCES

AP/1/A/5000/028 (Secondary Steam Leak) Revision 4, page 8
Question 87 from the 2005 Catawba NRC initial license exam

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

9. (Continued)

__ e. Verify atmospheric dump valves - CLOSED.

e. Perform the following:

1) Select "OFF RESET" on the following switches:

__ • "STEAM DUMP INTLK BYP TRN A"

__ • "STEAM DUMP INTLK BYP TRN B".

__ 2) **IF** valve will not close, **THEN** close affected atmospheric dump valve isolation valve.

__ 3) **IF** isolation valve will not close, **THEN** dispatch operator to fail air to affected atmospheric dump valve.

__ f. Verify CA PMP #1 - OFF.

__ f. **IF** operation of CA PMP #1 is causing uncontrolled cooldown **AND** flow from CA PMP #1 not required, **THEN** stop CA PMP #1.

Question: 05-87

1 Pt(s) Initial conditions:

- Unit 1 is operating at 10-8 amps taking critical data
- One atmospheric steam dump opens
- Crew is performing AP/1/A/5500/028, Secondary Steam Leak

What action is taken per AP/1/A/5500/028 to attempt to close the dump valve, and what design bases consideration (per Tech Spec 3.4.2, RCS Minimum Temperature for Criticality) is assured if this action is successful?

A. Take "A" and "B" "STEAM DUMP INTLK BYP" switches to "OFF/RESET" Steam generators are above their nil ductility reference temperature.

B. Dispatch operator to close the atmospheric dump valve isolation locally. MTC will be in the range of slightly positive to negative.

C. Take "A" and "B" "STEAM DUMP INTLK BYP" switches to "OFF/RESET" The pressurizer is within its normal startup and operating range.

D. Dispatch operator to close the atmospheric dump valve isolation locally. Proper indication and response of the excore detectors when the reactor is critical.