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May 28, 2009

Mr. Luis A. Reyes, Regional Administrator
U. S. Nuclear Regulatory Commission, Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, GA 30303

Subject: Duke Energy Carolinas, LLC (Duke)
McGuire Nuclear Station, Units 1 and 2
Post Examination Comments
50-369/2009-301 and 50-370/2009-301

Please find attached post examination documentation in accordance with NUREG-1021, Section ES-501 and formal comments in accordance with NUREG-1021, Section 402. This documentation is associated with the McGuire Nuclear Station initial written licensing examinations administered on May 22, 2009.

The following attachments contain justification for:

1) Removal of the designation of a "critical" step for RO JPM A-2.
2) Increasing the acceptable range in the answer for JPM A1a (RO & SRO).
3) Accepting 2 correct answers for question 74.
4) Deletion of question 81.

The Security Agreement will be provided when all signatures have been obtained.

Questions or comments should be directed to Kay Crane, McGuire Regulatory Compliance at (980) 875-4306 or Steve Helms, McGuire Operator Training at (980) 875-5030.

Bruce Hamilton

Bruce H. Hamilton

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RGC File

Attachment 1

RO Admin JPM A-2 (Perform Daily Surveillance Checklist)

Description of this JPM from ES-301-1:

A2 This is a new JPM. The operator will be told that Unit 1 and Unit 2 are in Mode 1 at 100% power, and provided with a just completed portion of PT/1/A/4600/003B, "Daily Surveillance Items," that reflects those items NOT simulated. The operator will be directed to perform Enclosure 13.1, Daily Surveillance Items Checklist in accordance with PT/1/A/4600/003B. The operator will be required to identify four items on the Checklist that do not meet the identified acceptance criteria, and one item that requires CRSRO notification.

This JPM was performed on the Simulator with static setup. The candidates were given the task of performing PT/1/A/4600/003 B Enc 13.1 (Daily Surveillance Items Checklist). This PT contains a list of Tech Spec required surveillances required to be performed every 24 hours and a total of 4 abnormal indications were provided in the simulator setup. One of the discrepancies was associated with a required check of FWST solution temperature which was indicating approximately 97 Deg F on gage 1FWP-5030.. Per the PT (Pg 2 of 8) the maximum FWST temperature is "Less than or equal to 100 F as read on 1FWP-5030 (Begin cooling FWST at 95 F)." This check in the PT contains a reference to Note 12 which states: "Actual Tech Spec limit is 100F. However, cooling of FWST should begin at 95 F to prevent exceeding Tech Spec limit." This note also references a PIP, (M96-2432) and was placed in the PT as a preventative measure to preclude exceeding the TS FWST temperature limit. This step in the PT satisfies SR 3.5.4.1 in which the FWST solution temperature is required to be verified to be $\geq$ 70 F and $\leq$ 100 F once per 24 hours. In additions, SLC surveillance TR 16.9.11.1 is also satisfied which contains the same temperature range and periodicity.

During performance of this JPM, several of the candidates did not identify or communicate to the examiner the need to begin cooling the FWST. While this would be considered a deficiency on the part of the candidate, this step was incorrectly identified as a critical step in the JPM standard and the omission of this notification should be not considered an automatic failure for this JPM. The justification of removal of this designation is that it does not impact the successful completion of PT. The Acceptance Criteria for this PT is as follows:

"Each applicable surveillance item meets its specified Acceptance Criteria per Enclosure 13.1 (Daily Surveillance Items Checklist) or is identified as a discrepancy, evaluated per Tech Spec and appropriate corrective action taken"

Due to the fact that both Tech Spec surveillances associated with this temperature check are satisfied with the indication given, the acceptance criteria for this element is met and therefore has no impact on the successful completion of the assigned PT..

*3	(Step 12.3) Check each applicable surveillance item in Enclosure 13.1 (Daily Surveillance Items Checklist) meets its Acceptance Criteria.	The operator places their initials in all Surveillance Items that are observed to meet their Acceptance Criteria. The operator recognizes that N43 (M1P1468) is NOT within 2% of the Heat Balance Calculation **(Does NOT initial step (1st block Page 1 of 8)).** The operator recognizes that 1NVP5760 and 1NVP5763 are NOT within 5% of each other **(Does NOT initial step (last block Page 1 of 8)).** The operator recognizes that the FWST Solution Temperature has met its Acceptance Criteria, however, is above the threshold that requires FWST Cooling to commence. **The operator initials the Surveillance Item, but informs the CRSRO of the need to begin FWST cooling**). The operator recognizes that the 1EMF-33 Operate light is NOT lit **(Does NOT initial step (3rd block from the bottom of Page 2 of 8)).**
		CUE: **If the operator indicates that RP should be notified to perform a Source Check, provide the following:** **RP is notified.**
		The operator recognizes that N43 (Drawer) is NOT within 2% of the Heat Balance Calculation **(Does NOT initial step (3rd block from the bottom of Page 3 of 8)).**

Enclosure 13.1

Daily Surveillance Items Checklist

Surveillance Item	Acceptance Criteria	Applicable Mode(s)							Notes	Initials
		1	2	3	4	5	6	No Mode		
Standby Nuclear Service Water Pond (SNSWP) Level	Greater than or equal to 739.5 feet	1	2	3	4				11	
SNSWP Temperature (Minimum)	Greater than or equal to 36°F	1	2	3	4				16	
SNSWP Temperature (Maximum)	Less than or equal to 78°F	1	2	3	4				3	
FWST Solution Temperature (Minimum)	Greater than or equal to 70°F as read on 1FWP-5030	1	2	3	4	5	6		17	
FWST Solution Temperature (Maximum)	Less than or equal to 100°F as read on 1FWP-5030 (Begin cooling FWST at 95°F.)	1	2	3	4				12, 17	
Train A Modulating Valves Reset (1MC11)	Reset lit	1	2	3	4	5	6		19	
Train B Modulating Valves Reset (1MC11)	Reset lit	1	2	3	4	5	6		19	
1EMF-31(Turbine Bldg Sump Disch) Channel Check	Operate light lit and loss of sample flow annunciator is <u>NOT</u> in alarm status	1	2	3	4	5	6	No Mode	4, 21	
1EMF-33 (Condenser Air Ejector Exhaust) Channel Check	Operate light lit	1	2	3	4	5	6	No Mode	4, 22	
0EMF-41 (Aux. Bldg. Ventilation) Channel Check	Operate light lit and loss of sample flow annunciator is <u>NOT</u> in alarm status. Ensure toggle switch in the scan position.	1	2	3	4	5	6	No Mode	4, 5, 7, 15	
0EMF-53 (Contaminated Material Whse) Channel Check	Operate light lit and loss of sample flow annunciator is <u>NOT</u> in alarm status	1	2	3	4	5	6	No Mode		

Unit 1

11. Acceptance Criteria

11.1 Each applicable surveillance item meets its specified Acceptance Criteria per Enclosure 13.1 (Daily Surveillance Items Checklist) or is identified as a discrepancy, evaluated per Tech Spec and appropriate corrective action taken.

11.2 For each cask listed in Enclosure 13.2 (NAC-UMS Cask Monitoring), one of the following Acceptance Criteria is met or individual cask is identified as a discrepancy, evaluated per Tech Spec A 3.1.6 for NAC-UMS Concrete Cask Heat Removal System and appropriate corrective action taken:

- Verify the difference between the ISFSI ambient temperature and the average air outlet temperature and is less than or equal to 102°F

OR

- Visually verify all four air inlet and outlet screens are unobstructed

12. Procedure

☐ 12.1 Check Unit 1 TSAIL Report for any outstanding items that may impact on performance of this procedure.

☐ 12.2 Complete Enclosure 13.1 (Daily Surveillance Items Checklist).

☐ 12.3 Check each applicable surveillance item in Enclosure 13.1 (Daily Surveillance Items Checklist) meets its Acceptance Criteria.

NOTE:	**<u>IF</u>** this procedure is being performed in preparation for a Mode change, performance of Enclosure 13.2 (NAC-UMS Cask Monitoring) is **<u>NOT</u>** required.

_____ 12.4 **<u>IF</u>** performing routine daily surveillances, complete the following:

☐ 12.4.1 Complete Enclosure 13.2 (NAC-UMS Cask Monitoring).

☐ 12.4.2 Check each installed cask listed in Enclosure 13.2 (NAC-UMS Cask Monitoring) meets its Acceptance Criteria.

_____ 12.5 **<u>IF</u>** a surveillance item was **<u>NOT</u>** completed due to Unit "Applicable Mode", identify surveillance item by writing "NA" in appropriate initial blank.

_____ 12.6 **<u>IF</u>** used to calculate Shutdown Margin, attach Enclosure 4.5 or 4.6 of OP/0/A/6100/006 (Reactivity Balance Calculation).

Surveillance Item	Acceptance Criteria	Applicable Mode(s)							Notes	Initials	Tech Spec / SLC
		1	2	3	4	5	6	No Mode			
Standby Nuclear Service Water Pond (SNSWP) Level	Greater than or equal to 739.5 feet	1	2	3	4				11		ITS SR 3.7.8.1
SNSWP Temperature (Minimum)	Greater than or equal to 36°F	1	2	3	4				16		TAC MCTC-1574-RN.S001-01
SNSWP Temperature (Maximum)	Less than or equal to 78°F	1	2	3	4				3		ITS SR 3.7.8.2
FWST Solution Temperature (Minimum)	Greater than or equal to 70°F as read on 1FWP-5030	1	2	3	4	5	6		17		ITS SR 3.5.4.1 SLC TR 16.9.14.1 SLC TR 16.9.11.1
FWST Solution Temperature (Maximum)	Less than or equal to 100°F as read on 1FWP-5030 (Begin cooling FWST at 95°F.)	1	2	3	4				12, 17		ITS SR 3.5.4.1 SLC TR 16.9.11.1
Train A Modulating Valves Reset (1MC11)	Reset lit	1	2	3	4	5	6		19		PIP M-96-02018
Train B Modulating Valves Reset (1MC11)	Reset lit	1	2	3	4	5	6		19		PIP M-96-02018
1EMF-31(Turbine Bldg Sump Disch) Channel Check	Operate light lit and loss of sample flow annunciator is **NOT** in alarm status	1	2	3	4	5	6	No Mode	4, 21		SLC 16.11.2-1 (2)
1EMF-33 (Condenser Air Ejector Exhaust) Channel Check	Operate light lit	1	2	3	4	5	6	No Mode	4, 22		SLC 16.11.7-1 (2)
0EMF-41 (Aux. Bldg. Ventilation) Channel Check	Operate light lit and loss of sample flow annunciator is **NOT** in alarm status. Ensure toggle switch in the scan position.	1	2	3	4	5	6	No Mode	4, 5, 7, 15		SLC 16.11.7-1 (5)
0EMF-53 (Contaminated Material Whse) Channel Check	Operate light lit and loss of sample flow annunciator is **NOT** in alarm status	1	2	3	4	5	6	No Mode			SLC 16.11.7-1 (7a)

7. **IF** 1EMF-36 is operable, the following EMFs should be operable but are **NOT** required: 0EMF-41, 1EMF-42, 0EMF-50 and 1EMF-39 (for Cont. Air Addition and Release only). **IF** 1EMF-36 is inoperable, the following EMFs shall be operable: 0EMF-41, 1EMF-42, 0EMF-50 (with WG System release isolation valve open), and 1EMF-39 (for Cont. Air Addition and Release only with VQ System release isolation valve open).

8. - At least one of three channels associated with each area monitored, excluding NC Pumps, is required to be operable. The channels are grouped as follows: Rx Lower Vessel (1,2,3), Rx Upper Head (4,5,6), A S/G (8,9,10), B S/G (12,13,14), C S/G (16,17,18), and D S/G (20,21,22).
   - **WHEN** performing sound channel check, always use the "Line" function.

9. **WHEN** the associated systems release isolation valve is locked closed, surveillance is **NOT** required.

10. During Core Alterations (except during latching and unlatching of control rod drive shafts) and movement of irradiated fuel assemblies within Containment.

11. **IF** instrument 0RNP-6000 (Standby NSW Pond Level) is inoperable, SNSWP Level can be determined by locally observing overflow from the SNSWP overflow at the north end of the dam. Overflow occurs at elevation 740'. **IF** SNSWP is **NOT** overflowing, SNSWP Level can also be determined using local level gauge at overflow enclosure. Go to the SNSWP overflow enclosure (Located SE of plant at intersection of old front entrance road and normal entrance road at pond. There is a concrete housing with steel mesh rebar and a steel grate walkway around enclosure). Using the walkway, go to the south side of the enclosure. At the end of the walkway is the level gauge made of flat steel that has elevation increments in fluorescent orange. The bottom increment indicates 740 ft. **IF** SNSWP level is less than 740', use a folding stick rule and measure from the top of water surface to the 740 ft mark. Subtract this measure from 740 ft to obtain actual level of SNSWP. Notify CRSRO of measurement.

12. Actual Tech Spec limit is 100°F. However, cooling of FWST should begin at 95°F to prevent exceeding Tech Spec limit. {PIP 0-M96-2432}

13. **IF** SDM is **NOT** within the limit specified in the COLR, boration shall be initiated within 15 minutes to restore SDM within limit.

14. **IF** in Mode 2, NA when K_{eff} is greater than or equal to 1.0.

15. Sample points 1, 7, and 12 shall be operable to meet the acceptance criteria. Corrective action shall be taken on any channel out of service.

16. TAC Sheet limit for SNSWP temperature is 32°F. Due to process instrument loop inaccuracy, if indicated SNSWP temperature is 36°F or less, instruct Work Control to activate Model Work Order #00406151 for manual determination of SNSWP temperature.

Attachment 2

RO/SRO Admin JPM A-1a (Determine Boric Acid Addition to the FWST)

Description of this JPM from ES-301-1:

A1a This is a modified JPM. The operator will be told that a leak, which is now isolated has lowered the FWST level to 440 inches, and that it has been decided to use the Recycle Holdup Tank (RHT) to refill the FWST. The operator will be told that Enclosure 4.4, "FWST Makeup Using the RHT," of OP/1/A/6200/014, "Refueling Water System" is in progress and completed through Step 3.9, and provided with Chemistry Data for the BAT and RHT. The operator will then be directed to determine the amount of Boric Acid needed to raise the FWST level to 480" using the RHT in accordance with Step 3.10 of Enclosure 4.4 of OP/1/A/6200/014, "Refueling Water System." The operator will be expected to calculate the amount of Boric Acid that must be added from the BAT to refill the FWST as 7,912 gallons ± 75 gallons.

During performance of this JPM, several of the candidates differed in how they interpreted Data Book Curve 7.7 (Refueling Water Storage Tank Level). The curve is a graphical representation of the FWST volume vs. tank level. This relationship is linear, and instead of just obtaining the volume from the graph for 440 inches and 480 inches, these candidates created a gallons per inch relationship based on information provided in an information block provided on the graph. This information block provided a value in gallons at 484 inches and 455.88 inches along with a "unusable" volume at 0 inches. If the candidate takes the difference between these levels and volumes, and subtracts the unusable volume, the result is an accurate means to determine the volume of water needed for the desired level change. Due to the very large capacity of the tank, the difference of the thickness of a line on the graph results in a 1000 gallon difference in the value obtained. Using the method, the value obtained differs from the value used in the standard of the JPM by approximately 1500 gallons. (30000 vs. approx 31500).

Using the numbers in the information block on Curve 7.7, there are two methods to determine the gallons / inch in the tank which is then multiplied by the desired change in tank level (in inches) to determine the total makeup volume to the FWST.

Using one method, the candidate would take either of the volumes listed in the information block (394,089 gallons or 372,100 gallons), subtract the unusable volume at zero inches (15,638 gallons), and then divide by the number of inches at the respective volume to obtain a gallons/inch value for the FWST. For example:

$$Tank\ Volume\ Per\ Inch = \frac{394{,}089\ gal. - 15{,}638\ gal.}{484\ inches}$$

$$Tank\ Volume\ Per\ Inch = 781.92\ \frac{gallons}{inch}$$

Using the second method, the candidate would use take the difference between the two tank volumes in the information block and then divide by the difference in inches between those two volumes. For example:

$$Tank\ Volume\ Per\ Inch = \frac{394{,}089\ gal. - 372{,}100\ gal.}{484\ inches - 455.88\ inches}$$

$$Tank\ Volume\ Per\ Inch = 781.97\ \frac{gallons}{inch}$$

The FWST gallons/inch is then multiplied by the desired change in tank level to obtain the total volume of water needed.

$$Desired\ Total\ Makeup\ Volume\ to\ FWST = (480\ inches - 440\ inches)\ 781.97\ \frac{gallons}{inch}$$

$$Desired\ Total\ Makeup\ Volume\ to\ FWST = 31{,}278.8\ gallons$$

The desired total makeup volume to the FWST is then used to calculated the total amount of boric acid (in gallons) needed for the makeup.

$$\left(\frac{(Desired\ Boron\ Conc) - (RHT\ Boron\ Conc)}{(BAT\ Boron\ Conc) - (RHT\ Boron\ Conc)}\right)\begin{pmatrix}Desired\ Total\ Makeup\\ Volume\ to\ FWST\end{pmatrix} = Desired\ BAT\ Volume$$

$$\left(\frac{(2700\ ppmB) - (1076\ ppmB)}{(7234\ ppmB) - (1076\ ppmB)}\right)(31{,}278.8\ gallons) = 8248.9\ gallons$$

In order to successfully complete the JPM, the candidate must first correctly determine the required volume of water to add as described above. Then, the candidate must determine the required amount of boric acid required to maintain the water addition at the Tech Spec required boron concentration. Due to the large variation in volume, (from even being the thickness of a line different in reading curve), a single value of 30000 gallons was chosen for the desired make up volume and no range was given in the standard. This was done to enhance the discriminatory value of the boric acid calculation. Even a small range provided in interpreting the curve resulted in a very large range in the resultant boric acid volume required. For the total make up volume used, the range provided in the standard is reasonable, but does not allow for much variation in determining the total volume needed. This resulted in the candidates who actually used an accurate means to determine the makeup volume, coming up with a boric acid volume which was outside the acceptable range as given in the JPM standard.

Based on the discussion above, the candidates who use the gallons per inch method should pass this JPM as long as the boric acid volume required is correct for the total makeup volume used. The difference in makeup volume would not challenge either the operation or the operability of the FWST. As long as the correct desired Boron concentration, RHT boron concentration, and BAT concentration are used, the difference in the total makeup volume only changes the final level in the FWST. The final FWST boron concentration would be the same.

Attachment 3

Examination Outline Cross-reference:	Level	RO	SRO
		X	X
	Tier #	2	
Final	Group #	1	
	K/A #	022K4.03	
	Importance Rating	3.6	4.0

Containment Cooling
Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following:
Automatic Containment Isolation

Proposed Question: Common 74

1 Pt Given the following conditions on Unit 1:

- A LOCA has occurred
- Safety Injection has been initiated

Which ONE (1) of the following describes the operation of the Containment Cooling system based on these conditions?

A. All VU units have started and RV containment isolation valves are open.

B. All VU units have started and RV containment isolation valves are closed.

C. All VU units have shunt tripped off and RV containment isolation valves are open.

D. All VU units have shunt tripped off and RV containment isolation valves are closed.

Proposed Answer: **C**

Explanation (Optional):

As a result of the Safety Injection signal a Phase A signal has also occurred. The Phase A signal causes the VU units to shunt trip off. However, RV remains aligned to the units. RV would isolate if a Phase B signal were received.

A. **Incorrect:** See explanation above. **Plausible** if the candidate confuses the operation of the VU units with the VL units. The VL units would start on the Safety Injections signal. Also, RV remains aligned to the VU units.
B. **Incorrect:** See explanation above. **Plausible** if the candidate confuses the operation of the VU units with the VL units. The VL units would start on the Safety Injections signal. The candidate may also confuse the operation of the RV containment isolation valves during a Phase A with the operation during a Phase B in which case the valves would close.
C. **Correct.**
D. **Incorrect:** See explanation above. **Plausible** if the candidate confuses the operation of the RV containment isolation valves during a Phase A with the operation during a Phase B in which case the valves would close. Also plausible because the VU fans do shunt trip off due to the Phase A signal.

Technical Reference(s)	Lesson Plan OP-MC-CNT-VUL, rev. 27 page 41	(Attach if not previously provided)
	Lesson Plan OP-MC-CNT-RV, rev 19 page 37	(Including version or revision #)

Proposed references to be provided to applicants during examination: None

Learning Objective: OP-MC-ECC-ISE, Obj 7 (As available)

Question Source:	Bank #		
	Modified Bank #		(Note changes or attach parent)
	New	X	

Question History: Last NRC Exam

Question Cognitive Level:	Memory or Fundamental Knowledge	______
	Comprehension or Analysis	X
10 CFR Part 55 Content:	55.41	41.7
	55.43	______

Comments:

Containment Cooling
Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following:
Automatic Containment Isolation

KA is matched because the candidate must understand the operation of the RV system containment isolation valves for various plant conditions.

This question is analysis level because the candidate must comprehend the status of the RV system based on analysis of the given conditions.

RO Question 74

After further investigation, we propose that answers ‘C’ and ‘D’ be accepted as correct.

For this particular question, the candidate was not given sufficient information in the stem of the question to conclusively choose one correct answer. In the stem of the question, the candidate is given that a LOCA and Safety Injection have occurred. However, the candidate is not given the magnitude of the LOCA. If the candidate assumes that the LOCA is not of sufficient size to have raised containment pressure to 3 PSIG, causing a Phase B isolation, then answer ‘C’ is correct. However, if the candidate assumes that the LOCA was of sufficient magnitude to result in a Phase B isolation, then answer ‘D’ is correct.

In a previous question (RO Question 18), the candidate is given a similar set of circumstances in the stem of the question in that a LOCA has occurred. In RO Question 18, the candidate is not given any indications that a Phase B isolation has occurred. However, the candidate had to make the assumption that a Phase B had occurred to correctly answer the question. Given a similar set of circumstances in Question 74, it is not implausible for the candidate to make the same assumption that a Phase B isolation has occurred. Therefore, the candidate may have chosen ‘C’ or ‘D’ based on their assumptions regarding the magnitude of the LOCA. Therefore MNS requests that both answers “C” and “D” be accepted as correct.

Attachment 4

Examination Outline Cross-reference:	Level	RO	SRO
			X
	Tier #		1
FINAL – 04/23/09	Group #		2
	K/A #	WE15EA2.2	
	Importance Rating		3.3

Containment Flooding:
Ability to determine and interpret the following as they apply to (Containment flooding) : Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Proposed Question: SRO 81

1 Pt With regards to the analysis for a Design Basis Containment Flooding event, which of the following describes (1) the basis for the maximum Containment sump level <u>AND</u> (2) the sources of water which contribute to the maximum sump level?

A. 1) Sufficient volume to prevent exceeding containment design pressure in the event of a hydrogen ignition event.
   2) The entire contents of the NC system, FWST, NI Accumulators and CA Storage Tank.

B. 1) Ensures that vital equipment needed for the safe shutdown of the plant remain available.
   2) The entire contents of the NC system, FWST, NI Accumulators and CA Storage Tank.

C. 1) Sufficient volume to prevent exceeding containment design pressure in the event of a hydrogen ignition event.
   2) The entire contents of the NC system, FWST, and NI Accumulators <u>ONLY</u>.

D. 1) Ensures that vital equipment needed for the safe shutdown of the plant remain available.
   2) The entire contents of the NC system, FWST, and NI Accumulators <u>ONLY</u>.

Proposed Answer:	**B**

Explanation (Optional):

FR-Z.2, Response to Containment Flooding provides procedural guidance when the level in Containment is greater than the design flood level (12.5 feet). This level is significant since critical system and components which are necessary to ensure an orderly and safe plant shutdown and provide feedback to the operator regarding plant conditions are normally located above the design flood level.

The maximum water level in Containment after an accident is based on the entire contents of the NC system, FWST, CA Storage Tank, and the NI Accumulators which approximates the maximum water volume introduced into Containment following a LOCA coincident with a steam line or feed line break inside Containment.

Introduction of water into Containment from sources other than those listed above can result in a water level that is higher than the maximum design level and potential compromise of critical systems and components.

Potential sources of water other than those listed above which may result in Containment flooding are:

- Service Water
- Component Cooling Water
- Reactor Makeup Water
- Demineralized Water

A. **Incorrect:** See explanation above. **Plausible** the free volume available in Containment is part of the calculations regarding whether Containment design pressure will be exceeded on a design basis accident. Also, the sources of water is correct.
B. **Correct.**
C. **Incorrect:** See explanation above. **Plausible** the free volume available in

Containment is part of the calculations regarding whether Containment design pressure will be exceeded on a design basis accident. The sources of water are plausible if the candidate does not understand that the maximum water level in the containment sump is based on a Large Break LOCA coincident with a Feed Line or Steam Line break which adds the entire contents of the CA Storage Tank to the inventory in the sump.

D. **Incorrect:** See explanation above. **Plausible** because the basis is correct and the sources of water are plausible if the candidate does not understand that the maximum water level in the containment sump is based on a Large Break LOCA coincident with a Feed Line or Steam Line break which adds the entire contents of the CA Storage Tank to the inventory in the sump.

Technical Reference(s)	Basis Document for FR-Z.2, Response to Containment Flooding, rev. 2 pages 2 & 7	(Attach if not previously provided)
	FR-Z.2, Response to Containment Flooding, rev 5, page 2	(Including version or revision #)

Proposed references to be provided to applicants during examination: None

Learning Objective: ______________ (As available)

Question Source:	Bank #		
	Modified Bank #		(Note changes or attach parent)
	New	X	

Question History: Last NRC Exam ______________

Question Cognitive Level:	Memory or Fundamental Knowledge	X
	Comprehension or Analysis	

10 CFR Part 55 Content:	55.41	
	55.43	43.5

Comments:

Containment Flooding:

Ability to determine and interpret the following as they apply to (Containment flooding) : Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

KA is matched because in order to comply with the requirements of the procedure (i.e. determine the source of the flooding and isolate that source), the candidate must understand the difference between what is a potential source of the flooding what is a source of water in the Containment sump that is considered "normal" per the Design Basis.

Meets SRO Only criteria linked to 10CFR55.43(b)(5) (Procedures). The correct answer can NOT be discerned from system knowledge, recognizing the entry conditions for FRP-Z.2, or recall of immediate actions. In order to correctly answer this question, the candidate must recall discreet information from specific procedural steps and/or the Design Basis.

Question rewritten on 4/16/09

SRO Question 81

After further investigation we propose that Question 81 be deleted due to no correct answer.

The original answer for Question 8, Part (2) ("the sources of water which contribute to maximum sump level") was based on the Westinghouse Owners Group basis document for FR-Z.2 (Response to Containment Flooding). The WOG document states

"the maximum water level in Containment after an accident is based on the entire contents of the NC system, FWST, CA Storage Tank, and the NI Accumulators which approximates the maximum water volume introduced into Containment following a LOCA coincident with a steam line or feed line break inside Containment".

Due to the generic nature of the WOG background document and the limited number of Ice Condenser containments, no mention is made concerning the water from our Ice Condenser Ice melt.

MNS Operations lesson plan for FR-Z.2 (Response to Containment Flooding) serves as our background document and provides detailed descriptions of the basis of each step in FR-Z.2. Upon review of our background documents for FR-Z.2, there is a difference between the WOG document and our background document. Our background document states:

"The maximum level of water in the Containment following a major accident generally is based upon the stored water volumes of the FWST, CLA's, ice condenser, and the NC system. This water volume approximates the maximum water volume introduced into the Containment following a LOCA plus a steam line or feed line break inside Containment".

This document, which is what the candidate would have been provided as study material, makes no mention of the water from the CA storage tank.

None of the answers proposed for Question 81 had the Ice condenser listed as a source of water and therefore no correct answer was provided for this question. Based on conflicting information contained in the references and the fact the question has no correct answer, this question should be deleted.

FR-Z.2, Response to Containment Flooding (continued)

The maximum level of water in the containment following a major accident generally is based upon the stored water volumes from the FWST, CLAs, ice condenser, and NC system. This water volume approximates the maximum water volume introduced into the containment following a LOCA plus a steamline or feedline break inside containment.

An indicated water level in the containment greater than the maximum expected volume (design basis flood level) is an indication that water volumes other than those represented by the above noted volumes have been introduced into the containment. Also, the high water level provides an indication that potential flooding of critical systems and components needed for plant recovery may occur. Identification and isolation for any broken or leaking water line inside containment is essential to maintaining the water level below the design basis flood level.

The actions in this procedure attempt to identify any unexpected source of water and isolate it if possible. Beyond that the station management is consulted to determine if transfer of containment sump water to other tanks is appropriate.

2.3. FR-Z.3, Response to High Containment Radiation Level

This procedure provides actions to respond if high radiation is present inside containment. The main purpose of the containment radiation monitors is to follow the radiation level in the containment during and after an accident that releases a significant quantity of radioactivity into the containment. The radiation alarm setpoint would be reached due to any significant NC leakage into containment or after a steamline break inside containment assuming technical specification leakage from the steam generators.

Additionally, it should be pointed out that the radiation level for the containment radiation monitor used in FR-Z.3 is higher than the setpoint which actuates containment ventilation isolation. The setpoint for containment ventilation isolation corresponds to a radiation level which is slightly above background radiation during normal plant operations.

The actions of this procedure verify containment ventilation isolation and attempt to reduce activity by containment filtration. The plant engineering staff is then notified of the existence of the excessively high radiation level.