In accordance with examination security guidance contained in NUREG 1021, Revision 11, APS requests that the material contained in the enclosures be withheld from public disclosure until after the examinations are complete.

NUREG 1021/10 CFR 55

Palo Verde
Nuclear Generating Station
P.O. Box 52034
Phoenix, AZ 85072
Mail Station 7636
Tel 623 393 5379

102-07881-MEK/JR
October 22, 2019

K. D. Clayton, Chief Examiner
U.S. Nuclear Regulatory Commission, Region IV
1600 E. Lamar Blvd.
Arlington, TX 76011-4511

Reference: NRC letter, "Palo Verde Nuclear Generating Station, Units 1, 2, and 3 – Notification of NRC Initial Operating Licensing Examination, dated February 26, 2019" ML19057A262

Dear Sir:

Subject: **Palo Verde Nuclear Generating Station (PVNGS)**
Units 1, 2, and 3 Docket Nos. STN 50-528, 50-529, 50-530
2019 Post-Exam Comments and Analysis Submittal

Arizona Public Service Company (APS) management has completed its review of the initial operator licensing examination conducted October 7 through October 11, 2019. Per NUREG 1021, Rev 11, Section ES-501 (C.1.b), this letter provides the required post examination documents. There were no substantive comments made by the applicants following the written examination. Enclosed examination documents are:

1. HARD COPY:
    - Original applicant written exam answer sheets
    - Written exam cover sheets
    - Two (2) clean copies of each applicant's answer sheet (made prior to grading)
    - Completed ES-403-1, Written Examination Grading Quality Checklist
2. ELECTRONIC COPY (on CD):
    - Scanned copies of original applicant written exam answer sheets (graded)
    - Scanned copies of written exam cover sheets
    - Scanned copies of clean applicant's answer sheets
    - As-given written exam
    - Updated written exam answer key

- Questions asked by and answers given to the applicants during exam administration
- Applicants' post-exam review comments
- Written exam seating chart
- Written exam performance analysis with recommended actions
- Recommended exam changes with justifications
- ES-201-3, Examination Security Agreement, as of 10-22-19 (completed ES-201-3 will be provided when all personnel have signed off security agreement)
- Copies of condition reports written or to be written as a means to improve exam processes, procedure quality, training quality, exam security, simulator fidelity, and any other general topics that relate to the exam process

As discussed with the Chief Examiner, APS will obtain post-exam signatures from individuals who had detailed knowledge of any part of the operating tests or written examination and electronically forward completed Form(s) ES-201-3, "Examination Security Agreement," with the appropriate pre- and post-examination signatures.

In accordance with examination security guidance contained in NUREG 1021 Revision 11 and ES-201, APS requests that the NRC Region IV office delay public release of the proposed and final operating test, written examinations and answer keys for a period of 2 years from the date of the examination completion.

No commitments are being made to the NRC by this letter.

If you have any questions or require additional information, please contact Jarred J. Shaver, Nuclear Training Section Leader, at (623) 393-4519.

Sincerely,

Matthew E. Kura
Department Leader, Regulatory Affairs, Compliance

MEK/JR

Enclosures:

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cc: (w/o enclosure)
S. A. Morris NRC Region IV, Regional Administrator
G. E. Werner NRC Region IV, Chief, Operations Branch
C. A. Peabody NRC Senior Resident Inspector for PVNGS

(w/ enclosure)
J. A. Bridges NRC Region IV, Licensing Assistant, Operations Branch

Withhold from Public Disclosure
Per NUREG 1021, Revision 11

Enclosures

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In accordance with examination security guidance contained in NUREG 1021, Revision 11, material contained in the enclosures shall be withheld from public disclosure until after the examinations are complete. APS requests withholding of this material for 2 years from the completion of examinations to align with the completion of the two-year training cycle.

Recommended Changes to the 2019 PVNGS NRC Initial Written Exam

Question 90 (graded with Q90 removed from exam per discussion with CE)

Given the timeline of events:

- **At time = 0100:** All three units tripped due to a loss of offsite power following an Operating Basis Earthquake:
- **At time = 0105:** Unit 1 had a loss of both EDGs due to Spray Pond piping ruptures in both EDG rooms
- **At time = 0115:** The Unit 1 CRS entered 40EP-9EO08, Blackout
- **At time = 0120:** Units 2 and 3 each reported that they have lost one EDG and their remaining EDG is supplying their Train 'A' Class 4.16kV Bus
- **At time = 0125:** The ECC reported that an offsite line will be available in ~ 3 hours
- **At time = 0155:** The SBOG operator reports that neither SBOG will start

Based on the timeline of events, the Unit 1 CRS should ___(1)___ , and 40MG-9ZZ07, FLEX Support Guidelines, ___(2)___ required to be performed.

A. (1) remain in 40EP-9EO08, Blackout
   (2) IS

B. (1) remain in 40EP-9EO08, Blackout
   (2) is NOT

C. (1) transition to 40EP-9EO09, Functional Recovery
   (2) IS

D. (1) transition to 40EP-9EO09, Functional Recovery
   (2) is NOT

Proposed Answer:	A

Explanations:	
A.	Correct.
B.	First part is correct. Second part is plausible since off-site power will be available well within the PVNGS blackout coping time of 16 hours, however if AC power will not be restored to a unit within 1 hour, entry into the ELAP procedure is required.
C.	First part is plausible since Unit 1 is operating on battery power and the Vital Auxiliary safety function will not be satisfied indefinitely, however all safety functions are currently met, therefore transition to the functional recovery procedure would not be warranted at this time. Second part is correct.
D.	First part is plausible since Unit 1 is operating on battery power and the Vital Auxiliary safety function will not be satisfied indefinitely, however all safety functions are currently met, therefore transition to the functional recovery procedure would not be warranted at this time. Second part is plausible since off-site power will be available well within the PVNGS blackout coping time of 16 hours, however if AC power will not be restored to a unit within 1 hour, entry into the ELAP procedure is required.

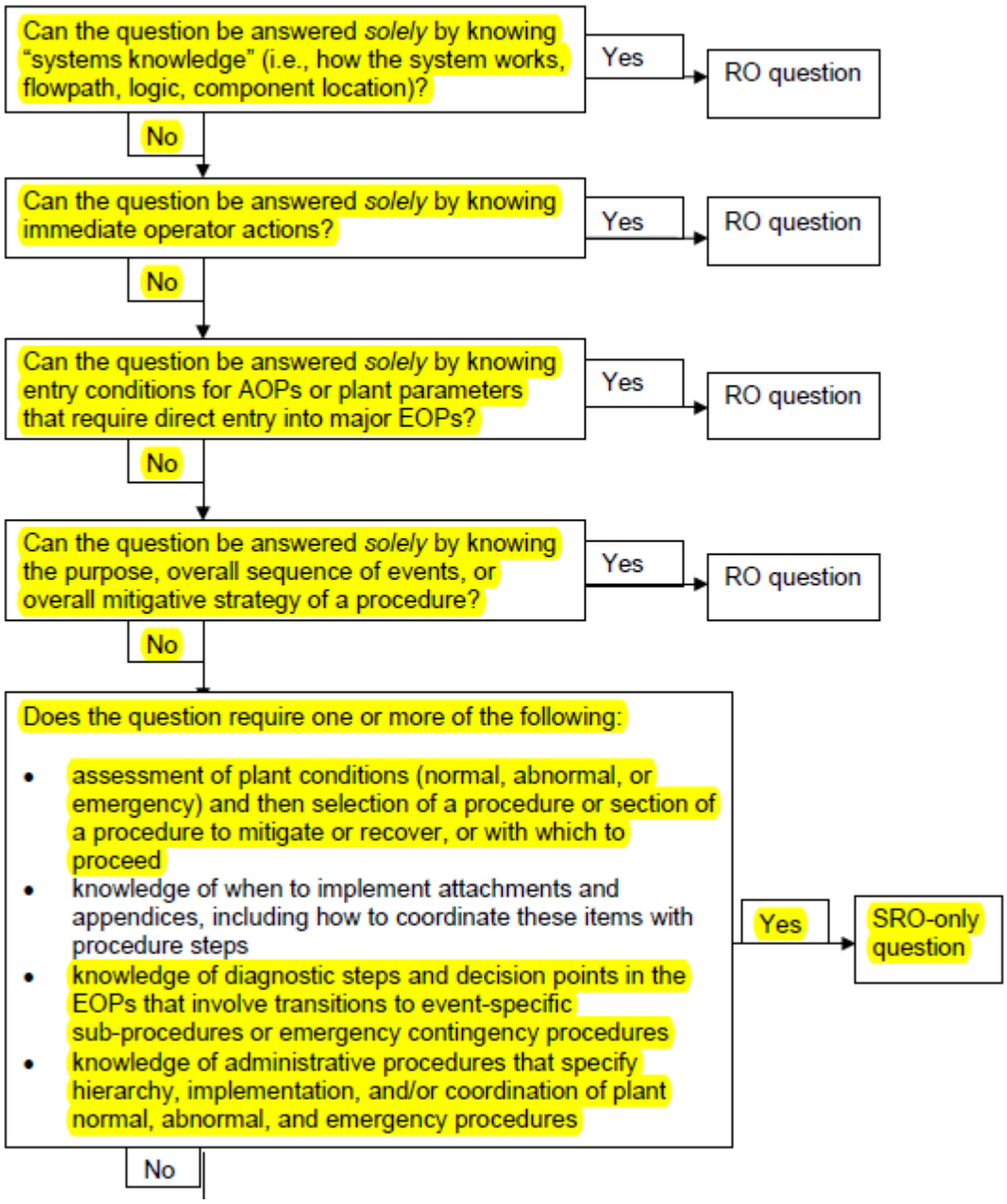
Question Source:	X	New	
		Bank	
		Modified	
		Previous NRC Exam	

Cognitive Level:		Memory or Fundamental Knowledge
	X	Comprehension or Analysis

Level of Difficultly:	4	
10CFR55.43:	5	
Reference Provided:	N	
Learning Objective:	10535 – Identify whether or not exit from the Blackout EOP is appropriate	

Technical Reference:	SRO Only Question Guidance from NUREG 1021

Figure 2-2 Screening for SRO-Only Linked to 10 CFR 55.43(b)(5) (Assessment and Selection of Procedures)



Technical Reference:	40EP-9EO08, Blackout

Generally, if a SFSC is not satisfied in an optimal EOP, it is an automatic kickout to the Functional Recovery procedure, however in the case of a Blackout where no class buses will restored within an hour, the correct action is to remain in Blackout and declare an ELAP is in progress.

3.0 INSTRUCTIONS/ CONTINGENCY ACTIONS

INSTRUCTIONS	CONTINGENCY ACTIONS
NOTE Harsh conditions are containment temperature greater than 170°F or containment radiation level greater than 10^8 mR/hr. Harsh containment values are placed in brackets next to the normal setpoint or band.	
NOTE During Blackout conditions inadequate lighting may exist in access areas and equipment rooms. Local operation of equipment may require the use of portable lighting.	
1. Monitor the SFSCs by performing the following: a. Check the Safety Function Status Check acceptance criteria are satisfied. b. Direct Chemistry to PERFORM 74DP-9ZZ05, Abnormal Occurrence Checklist.	1.1 Perform the following: a. Rediagnose the event. b. **IF** an ELAP is in progress, **THEN** GO TO step 2. c. GO TO **ONE** of the following: • Appropriate Optimal Recovery Procedure • 40EP-9EO09, Functional Recovery

Technical Reference:	40EP-9EO08, Blackout

Due to the listed conditions, it is clear that power will not be restored within one hour, therefore an ELAP will have to be declared and the CRS will implement 40MG-9ZZ07, FLEX Support Guidelines

✱ 13. **IF** at least one vital 4.16 kV AC bus is **NOT** expected to be energized within one hour of the start of the event from **EITHER** of the following:

- Offsite power
- Diesel Generator

THEN PERFORM Appendix 80, Align SBOG to PBA-S03 (BO).

13.1 **IF** PBA-S03 is **NOT** available, **THEN** PERFORM Appendix 81, Align SBOG to PBB-S04 (BO).

13.2 **IF** AC power will **NOT** be available from offsite power, an SBOG, or any Unit's EDG within one hour of the start of the event (ELAP), **THEN** perform the following:

a. Declare an ELAP is in progress.

b. PERFORM 40MG-9ZZ07, FLEX Support Guidelines.

c. GO TO step 14.

Facility Position: In the stem of the question, Unit 1 has been in a blackout for 50 minutes. As such, it is reasonable for the examinee to either determine that performance of 40MG-9ZZ07, FLEX Support Guidelines is NOT required because an hour has not yet elapsed since the start of the blackout condition. It is also reasonable to determine, given the conditions in the stem, that it is likely the blackout condition will exist for greater than one hour, in which case an ELAP would be declared and performance of 40MG-9ZZ07 would be required. The information presented in the stem provides a situation in which an SRO would be within their positional discretion to either wait the full 60 minutes, then implement 40MG-9ZZ07, FLEX Support Guidelines, or, based on their assessment of plant conditions, determine that an ELAP is imminent, which would then require implementation of the FLEX Support Guidelines.

Per Step 13 in 40EP-9EO08, Blackout, "IF at least one vital 4.16 kV AC bus is NOT expected to be energized within one hour of the start of the event from either offsite power, an Emergency Diesel Generator, or an SBOG" then the contingency actions would be performed. If the applicant expects that power will be available from one of those sources, they would NOT proceed to the contingency actions, which is where 40MG-9ZZ07, FLEX Support Guidelines, is directed.

Step 13.2 (contingency action for step 13) in 40EP-9EO08, Blackout, states, "IF AC power will NOT be available from offsite power, an SBOG, or any Unit's EDG within one hours of the start of the event (ELAP), THEN perform the following: Declare an ELAP is in progress and PERFORM 40MG-9ZZ07, FLEX Support Guidelines". The way this step is worded, the requirement to implement the FLEX Support Guidelines BEFORE one hour has elapsed is based on the assessment of whether or not power may be restored before one hour has elapsed. If the CRS has determined that power may be restored before one hour has elapsed, FLEX Support Guidelines is NOT required. If the CRS has determined that power will NOT be restored before one hour has elapsed, FLEX Support Guidelines IS required.

Exam Author Perspective: When I wrote the question, I intended for the student to assume that power would not be restored within an hour of the event. The reason I wrote the question 50 minutes into the blackout instead of greater than one hour was to enhance the plausibility of distractors 'B' and 'D'. In doing so, I believe that I increased the ambiguity of the question which resulted in the examinees being forced to make an assumption about the restoration of power which would be required to answer the question. In hindsight, I would have placed Unit 1 > one hour into the blackout to conclusively state that an ELAP was in progress to ensure that only one answer could be argued as correct.

Facility Recommendation: Per NUREG 1021, ES-403, Section D.1.b, the question contained “an unclear stem that confused the applicants or **did not provide all the necessary information**” to conclusively answer the question.

Although ‘A’ and ‘B’ part 2 (IS and IS NOT required) are conflicting, they are each correct based on two different but valid assessments of the given conditions. Based on ‘C’ and ‘D’ being clearly incorrect, and either ‘A’ or ‘B’ being correct based on CRS judgment, our recommendation is to either accept both ‘A’ and ‘B’ as correct or remove the question from the exam since neither ‘A’ nor ‘B’ can be conclusively justified as incorrect.

Question 96 (graded question as-is per discussion with CE)

Given the following conditions:

- A design change is being proposed for all three units
- The proposed change is required to be assessed using the 50.59 process

(1) Which part of the 50.59 process will indicate if a 50.59 evaluation is required to be performed?

(2) If a 50.59 evaluation is required, what are the MINIMUM qualifications required to perform the evaluation?

A. (1) Screening
(2) 50.59 Evaluator qualification ONLY

B. (1) Screening
(2) 50.59 Evaluator qualification AND an SRO license

C. (1) Applicability Determination
(2) 50.59 Evaluator qualification ONLY

D. (1) Applicability Determination
(2) 50.59 Evaluator qualification AND an SRO license

Proposed Answer:	A

Explanations:	
A.	Correct.
B.	First part is correct. Second part is plausible since one of the minimum education and experience requirements to qualify as a 50.59 evaluator is an SRO license, however having an SRO license is not a requirement in order to perform a 50.59 evaluation, only the 50.59 evaluator qualification is required.
C.	First part is plausible since the applicability determination is used to determine if 50.59 applies or if the change is covered by another regulation, and is one of the two stages in the three step process that proceeds the evaluation, however the applicability determination indicates if a screening is required, not an evaluation. Second part is correct.
D.	First part is plausible since the applicability determination is used to determine if 50.59 applies or if the change is covered by another regulation, and is one of the two stages in the three step process that proceeds the evaluation, however the applicability determination indicates if a screening is required, not an evaluation. Second part is plausible since one of the minimum education and experience requirements to qualify as a 50.59 evaluator is an SRO license, however having an SRO license is not a requirement in order to perform a 50.59 evaluation, only the 50.59 evaluator qualification is required.

Question Source:	X	New	
		Bank	
		Modified	
		Previous NRC Exam	

Cognitive Level:	X	Memory or Fundamental Knowledge
		Comprehension or Analysis

Level of Difficultly:	3	
10CFR55.43:	3	
Reference Provided:	N	
Learning Objective:	10080 – Describe the purpose of the 50.59 safety screening and evaluation	

Technical Reference:	SRO Only Question Guidance from NUREG 1021

C. Facility Licensee Procedures Required To Obtain Authority for Design and Operating Changes in the Facility [10 CFR 55.43(b)(3)]

Some examples of SRO exam items for this topic include the following:

- screening and evaluation processes under 10 CFR 50.59, "Changes, Tests and Experiments"

Technical Reference:	93DP-0LC07, 10CFR50.59 and 72.48 Screenings and Evaluations

10 CFR 50.59 and 72.48 Screenings and Evaluations	93DP-0LC07	Revision 28

4.1.2.5 If the Applicability Determination indicates that other regulations or change processes apply to any part of the activity, then ensure that they are fully addressed as required by the applicable regulation or change process.

a. If other regulations or change processes cover the "entire scope" of the activity, then a 10 CFR 50.59 and/or 72.48 Screening is not required.

1) Document the Applicability Determination as such in the affected change package (for example: procedure change record, engineering design change, etc.).

- Specify the appropriate criteria that was used in making the determination that a 10 CFR 50.59 and/or 72.48 screening is not required.
- Print the name of the individual performing the Applicability Determination near the applicability determination statement.

b. If other regulations or change processes do not cover the "entire scope" of the activity, or the proposed activity impacts other aspects of the facility unrelated to the regulation or change process, then complete the non-applicability review per Step 4.1.2.4.

c. If it is determined that a 50.59 or 72.48 screening is required for a portion of the scope of the change, initiate the screening per Section 4.2, 10 CFR 50.59 and/or 72.48 Screenings.

4.2.15.4 If the proposed activity does require a change to a Technical Specification, then check the "YES" response and document a brief justification using the following guidance:

- Ensure that each potentially affected Technical Specification is addressed.
- Summary statements of relevant information are acceptable; it is not necessary to quote word for word from the Technical Specifications.
- GO TO Step 4.2.16.

4.2.16 **Screening Completion**

4.2.16.1 Ensure that ALL of the following have been completed prior to proceeding to the next step:

- A documented response is provided for each question.
- A "YES" or "NO" response is indicated for each screening question.
- The page numbering is correct on each page of the screening.
- The "Document Number" and "Revision" of the activity under review is on each page of the screening.

4.2.16.2 Obtain an independent review of the screening by a qualified individual.

a. The Reviewer shall not be the screener for the screening under review.

b. Screening reviews shall be completed by individuals who are qualified as Screeners or Evaluators.

c. Any issues or comments are to be resolved with the original Screener.

d. Refer to Section 4.4, Record Turnover, for signature requirements.

4.2.16.3 If the answer to any Screening Question #1 through #4 is marked "YES", then perform the following:

a. Do not obtain a screening number.

b. GO TO Section 4.3, 10 CFR 50.59 and/or 72.48 Evaluations, to complete a 10 CFR 50.59 or 72.48 Evaluation.

Technical Reference:	93DP-0LC07, 10CFR50.59 and 72.48 Screenings and Evaluations

Qualification requires a prerequisite, one of which is an SRO license, however there are two other ways to meet the education and experience prerequisite so an SRO license is NOT required to perform a 50.59 evaluation.

10 CFR 50.59 Requirements	FUNCTION		
	Applicability Determination	Screener	Evaluator
Minimum Education And Experience	N/A	A degree[1] with 4 years or commercial nuclear power experience[2]; or an SRO[3] with 4 years of commercial nuclear power experience[2]; or a high school diploma with 8 years commercial nuclear power experience[2]; or a degree[1] and completion of the Engineering Legacy Training Program.	A degree[1] with 6 years of commercial nuclear power experience[2]; or an SRO[3] with 6 years of commercial nuclear power experience[2]; or a high school diploma with 10 years commercial nuclear power experience[2].
APS Direct Employee	Not Required	Not Required	Not Required
Specific 10 CFR 50.59 Training Requirements	Successful completion of the applicability determination course or else the initial 10 CFR 50.59 training course and successful completion of the applicable requalification course annually after initial qualification.	Successful completion of the initial 10 CFR 50.59 training course, successful completion of the applicability determination course, and successful completion of the applicable requalification course annually for Screener and annually for applicability determination after initial qualification.	Successful completion of the initial 10 CFR 50.59 training course and successful completion of the applicable requalification course annually after initial qualification. 10 CFR 50.59 Screener qualification is required for 10 CFR 50.59 Evaluator qualification.
Qualification Cards	N/A	ESP27-xx-001[4,5]	ESP27-xx-002[4]
Performance Requirements	N/A	Completion of two simulated or actual 10 CFR 50.59 screenings.	Completion of two simulated or actual 10 CFR 50.59 evaluations.

Facility Position: The original question submitted for this K/A was graded as LOD 1. In an attempt to raise the level of difficulty, the second part of the question was modified. In doing so, the exam team lost the operational validity of the question.

The SRO Master Task List includes the 50.59 process, “Assess compliance with 10CFR50.59”. This is covered in the classroom and on OJT for initial training, and via Computer Based Training (CBT) for continuing training. The objectives for initial 50.59 training are:

- Describe operations responsibilities IAW 93DP-0LC07, 10CFR50.59 and 72.48 Screening and Evaluations
- Describe the purpose of the 50.59 review process
- Describe when a 50.59 screening is required
- Describe the NRC definition of change as it applies to 10CFR50.59
- Describe the regulatory basis for non-applicability determinations
- Describe the relationship of 10CFR50.59 to other change regulations

Technical Reference:	93DP-0LC07, 10CFR50.59 and 72.48 Screenings and Evaluations

The operations responsiblities would best correlate, for an SRO, with a PVNGS Section / Team leader. The following indicates what is covered by the first objective listed above:

PVNGS NUCLEAR ADMINISTRATIVE AND TECHNICAL MANUAL Page 9 of 73

10 CFR 50.59 and 72.48 Screenings and Evaluations	93DP-0LC07	Revision 28

2.6 **PVNGS Section / Team Leaders**

- Ensure that individuals designated to perform applicability determinations, screenings, evaluations, and reviews per this procedure are qualified to the appropriate level for the task to be performed per Appendix C - 10 CFR 50.59 and 72.48 Qualification Requirements.
- Determine if proposed activities being reviewed per this procedure are complex activities that require participation of more than one discipline or area of expertise.
- Ensure that sufficient collective experience is assigned to support and complete each screening and/or evaluation.
- Perform pre-job (prevent-events) briefing or two-minute drill with the individual(s) assigned to perform activities per this procedure when appropriate.

In the introduction section of the 50.59 lesson plan, it states, “It is extremely important that the SM/CRS ensures that the individual(s) performing the Applicability Determination, Screening, or Evaluation are qualified to perform that function”, however there is no discussion about what those qualifications are, nor what the prerequisites for those qualifications are. The process for determining if an individual is or is not qualified to perform is to enter the individual’s name in to TQUALS (PVNGS qualification verification system) and the system will simply indicate what that person is currently qualified. So while the ability to verify 50.59 qualifications is part of the SRO job function, details of the requirements of said qualifications is not.

The SRO Job Qualification Card contains items related to the 50.59 process as well:

- Assess impacts to 10CFR50.59 and 72.48 following a TAPA (Temporary Approved Procedure Action)
- Assess impacts to 10CFR50.59 and 72.48 following a change to an Operations Technical Document to align a system or component

In both sections, the “assess impacts” directive determines if the TAPA or change to the TD requires the applicant to determine whether or not use of the 50.59 process is

required. Determining the minimum requirements to perform the applicability determination, screening, or evaluation is not part of the SRO Job Qualification Card.

At PVNGS, 50.59 applicability determinations can be performed by licensed operators as well as other departments (i.e. engineering), however 50.59 screenings and evaluations require a qualification beyond that which is normally expected as an SRO. Currently, there are 121 people at PVNGS qualified as a 50.59 screener and 26 people qualified as a 50.59 evaluator, none of whom hold an operating license at PVNGS nor do they work for the Operations Department. Being qualified in the 50.59 process is not a requirement to stand watch in an SRO position (currently 26 licensed SROs are qualified applicability determination out of a total 62 of licensed SROs). We believe the second part of the question is beyond the scope of knowledge required for an SRO and is not part of the SRO job function at PVNGS.

Exam Author Perspective: I originally submitted a question based on the 50.59 process (applicability determination, screening, evaluation) that contained the information I felt was appropriate for an SRO applicant to know from memory. The question was graded as LOD-1 and I worked to revise it. I incorporated part of the original submitted question (part 1 of the as-given question) and modified the second part of the question to ask about the required qualifications to perform a 50.59 evaluation. I validated the modified question with six SROs and the feedback was positive. What I did not recognize is that most of the SROs were former engineers and since 50.59 evaluations are an engineering task, they readily knew that an SRO license is not required to perform 50.59 evaluations. By asking the details of what specific qualifications are and are not required in order to perform a 50.59 evaluation, I was outside the scope of what an SRO is required to know to perform their job function.

Facility Recommendation: Per NUREG 1021, ES-403, Section D.1.b, the question “is at the wrong license level or **not linked to job requirements**”.

Since performing 50.59 evaluations, and more specifically, knowledge of the minimum requirements to qualify as a 50.59 evaluator, are not a part of the SRO job function, the second part of the question is inappropriate for an SRO licensing exam and should be removed from the exam.

Question 99 (graded with both 'A' and 'C' accepted as correct answers per discussion with CE)

(1) Per 40EP-9EO07, LOOP/LOFC, to meet the Containment Temperature and Pressure Control Safety Function following a loss of offsite power, Containment temperature must be less than a MAXIMUM of…

(2) Per 40EP-9EO08, Blackout, to meet the Containment Temperature and Pressure Control Safety Function, Containment temperature must be less than a MAXIMUM of…

A. (1) 117°F
(2) 200°F

B. (1) 117°F
(2) 235°F

C. (1) 125°F
(2) 200°F

D. (1) 125°F
(2) 235°F

Proposed Answer:	C

Explanations:	
A.	First part is plausible since 117°F is the containment temperature limit per 40EP-9EO07, however only if there is a loss of forced circulation without a loss of offsite power. Second part is correct.
B.	First part is plausible since 117°F is the containment temperature limit per 40EP-9EO07, however only if there is a loss of forced circulation without a loss of offsite power. Second part is plausible since 235°F is the containment temperature limit during a LOCA or if the Functional Recovery procedure is used, however during a blackout, the temperature limit is 200°F.
C.	Correct.
D.	First part is correct. Second part is plausible since 235°F is the containment temperature limit during a LOCA or if the Functional Recovery procedure is used, however during a blackout, the temperature limit is 200°F.

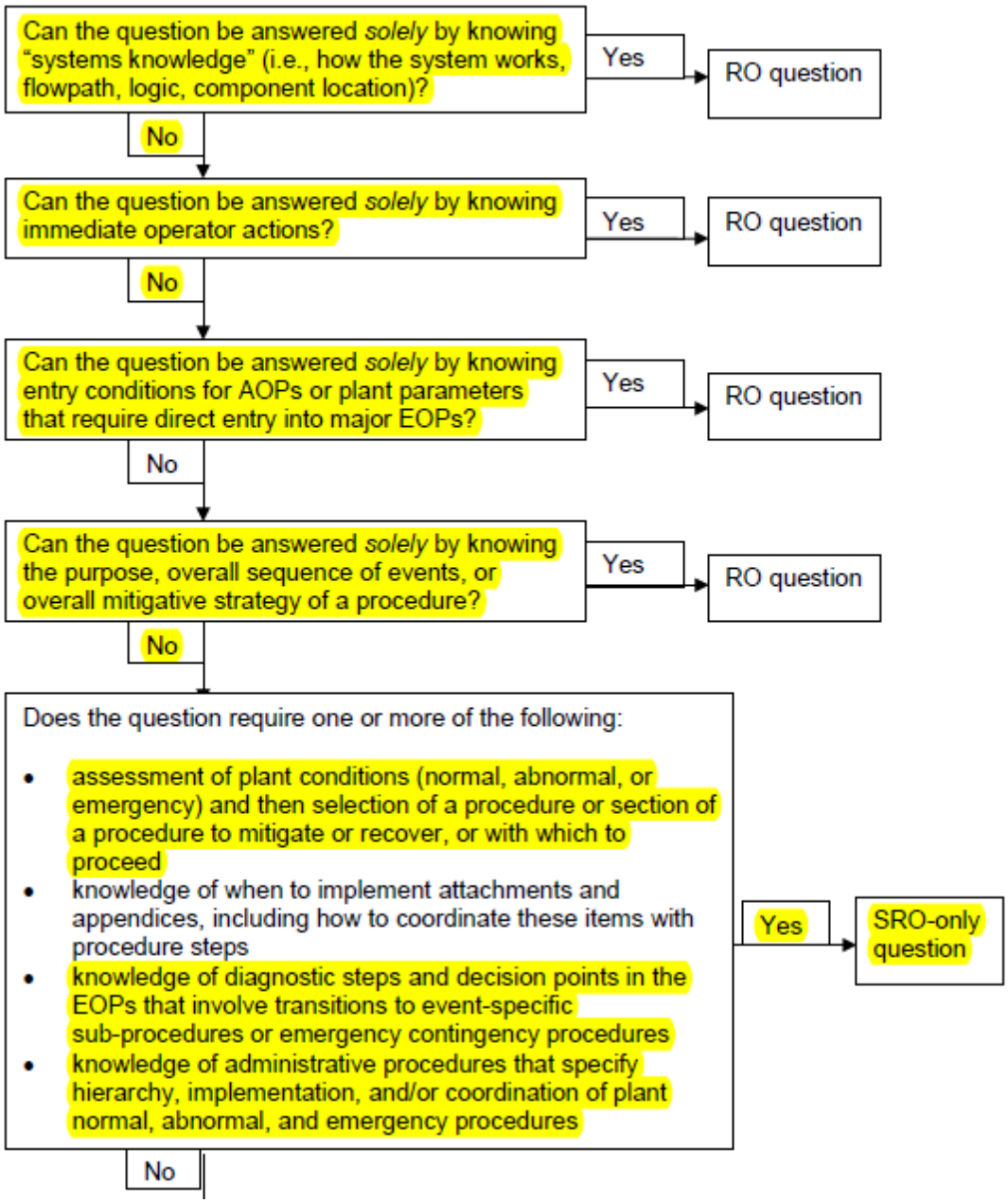
Question Source:	X	New	
		Bank	
		Modified	
		Previous NRC Exam	

Cognitive Level:	X	Memory or Fundamental Knowledge
		Comprehension or Analysis

Level of Difficultly:	3	
10CFR55.43:	5	
Reference Provided:	N	
Learning Objective:	10319 – Analyze Containment Temperature and Pressure Control to determine if the SFSC acceptance criteria is satisfied	

Technical Reference:	SRO Only Question Guidance from NUREG 1021

Figure 2-2 Screening for SRO-Only Linked to 10 CFR 55.43(b)(5) (Assessment and Selection of Procedures)



Technical Reference:	40EP-9EO07, LOOP/LOFC

Prior to Feb 2018, the containment temp limit was 117°F for a LOOP and a LOFC, however the containment temp limit was raised to 125°F if a loss of offsite power has occurred.

SAFETY FUNCTION:

7. Containment Isolation

ACCEPTANCE CRITERIA:	CRITERIA SATISFIED
a. Containment pressure is less than 2.5 psig.	☐ ☐ ☐ ☐
b. No valid containment area radiation monitor alarms or unexplained rise in activity.	☐ ☐ ☐ ☐
c. No valid steam plant activity radiation monitor alarms or unexplained rise in activity.	☐ ☐ ☐ ☐

SAFETY FUNCTION:

8. Containment Temperature and Pressure Control

ACCEPTANCE CRITERIA:	CRITERIA SATISFIED
a. Containment temperature is less than ONE of the following: • 117°F • 125°F during a Loss of Offsite Power	☐ ☐ ☐ ☐

Technical Reference:	40EP-9EO08, Blackout

BLACKOUT

Page 38 of 43

SAFETY FUNCTION:

8. Containment Temperature and Pressure Control

ACCEPTANCE CRITERIA:	CRITERIA SATISFIED
a. Containment temperature is less than 200°F.	☐ ☐ ☐ ☐
b. Containment pressure is less than 2.5 psig.	☐ ☐ ☐ ☐

Technical Reference:	40EP-9EO03, LOCA

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SAFETY FUNCTION:

8. Containment Temperature and Pressure Control

---------- **NOTE** ----------

Meeting the provisions of Condition 1 or Condition 2 will satisfy the Containment Temperature and Pressure Control Safety Function.

---------- **NOTE** ----------

Hydrogen criterion may be omitted until hydrogen monitor is in service.

ACCEPTANCE CRITERIA:	CRITERIA SATISFIED
Condition 1	
a. Containment temperature is less than 235°F.	☐ ☐ ☐ ☐

Facility Position: 40EP-9EO07, Loss of Offsite Power / Loss of Forced Circulation, was modified in February of 2018 to reflect the change from 117°F as the maximum containment temperature to satisfy the Containment Temperature and Pressure Control safety function during both a loss of offsite power and a loss of forced circulation. The EOP modification kept maximum containment temperature for a loss of forced circulation at 117°F, but modified the maximum containment temperature for a loss of offsite power to125°F. However, 40DP-9AP12, Loss of Offsite Power / Loss of Forced Circulation Technical Guideline, still indicates that the maximum containment temperature required to satisfy the Containment Temperature and Pressure Control safety function for a Loss of Offsite Power or Loss of Forced Circulation event is 117°F:

Technical Reference:	**40DP-9AP12, Loss of Offsite Power – Loss of Forced Circulation Technical Guideline**

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Loss of Offsite Power / Loss of Forced Circulation Technical Guideline	40DP-9AP12	**Revision** 27

4.6.6 SFSC #6 - RCS Heat Removal

A. The intent of the RCS heat removal safety function is to ensure adequate heat removal from the RCS via at least one Steam Generator.

At least one Steam Generator with level within the normal control band or being restored by feedwater ensures that the Steam Generator(s) has sufficient inventory for RCS heat removal.

RCS T_c stable or lowering indicates that heat is being removed from the RCS which indicates the Steam Generator(s) is effective in removing heat.

4.6.7 SFSC #7 - Containment Isolation

A. The intent of the Containment Isolation Safety Function is to confirm that Containment integrity exists. Consequently, radionuclides will remain in the containment building and not be released to the environment.

The acceptance criteria are designed to confirm that a normal containment environment exists. Containment pressure is not expected to exceed the high alarm setpoint. There should be no steam plant activity present if only a LOOP is occurring. This criterion is used as a diagnostic to check that a Steam Generator Tube Rupture has not occurred.

4.6.8 SFSC #8 - Containment Temperature and Pressure Control

A. The intent of the Containment Temperature and Pressure Control Safety Function Status Check is to ensure that containment atmospheric conditions are within the expected post-trip limits.

It is not expected during a Loss of Offsite Power event that the Tech Spec temperature limit will be exceeded or that containment pressure will rise to the alarm setpoint.

Technical Reference:	PVNGS Technical Specifications

3.6 CONTAINMENT SYSTEMS

3.6.5 Containment Air Temperature

LCO 3.6.5 Containment average air temperature shall be ≤ 117°F.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Containment average air temperature not within limit.	A.1	Restore containment average air temperature to within limit.	8 hours
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

EOPs and the associated Technical Guidelines are routinely used for both periodic and NRC written exam. For example, the 2019 NRC Initial Written Exam questions 13 and 36 directly asked about content in the Technical Guidelines, and questions 21, 80, and 85 used the Technical Guidelines in the pedigree to support correct (or plausible incorrect) answers. As a result, the applicants regularly study the Technical Guidelines throughout the program to aid in learning the EOPs.

Exam Author Perspective: When I developed the question, I assumed that the Containment Temperature and Pressure Control safety function limit was the same in the EOP and the EOP Tech Guideline and did not check to ensure they matched. Since the Tech Guideline for each EOP provides amplifying information for the associated EOP, they should match. Although I routinely use the EOP Technical Guidelines for exam questions, I didn't see the need to reference or check it for this question as the information was identified in the EOP. Had I recognized the difference while I was

developing the question, I would have chosen a different safety function to test and generated a Condition Report to address the procedure misalignment.

Facility Recommendation: Per NUREG 1021, ES-403, Section D.1.b, the question contained "**newly discovered technical information that supports a change in the answer key**".

Based on having two approved EOP documents with conflicting information about the maximum allowable temperature following a Loss of Offsite Power event, we recommend accepting both 'A' and 'C' as correct answers due to approved technical documents listing both 117°F and 125°F as the containment temperature safety function limit for a Loss of Offsite Power.

Written Examination Question Assessment

Questions ≥ 50% of the candidates missed

Question #	Success Rate	Description
16	33%	Question asked about actions directed from the Alarm Response Procedure following a trip of a Charging Pump. 67% of applicants chose distractor A. Student feedback indicated that the "normal response" would be to get a Charging Pump started soon enough to prevent isolation of letdown. Aligning the Charging Pump Selector Switch could be done after the Charging Pump was started so there was no need to start the Charging Pump using the selector switch up front. In other circumstances in which letdown may be lost without prompt action (i.e. a temperature transmitter failure which changes the PLCS setpoint), starting the standby Charging Pump directly is an acceptable action, however per the ARP, the selector switch is used following a trip of a Charging Pump. Most were unaware of the ARP guidance to start the standby Charging Pump using the selector switch. Generated CR to LOIT for analysis of training on immediate actions for various conditions to prevent a loss of letdown. Question was determined to be valid.

Question #	Success Rate	Description
23	26%	Question asked about the Reactor trip setpoint for low SG levels and the basis for the setpoint. All applicants knew the setpoint but everyone who missed it did so because they did know the reason for the setpoint. 74% of applicants chose distractor C. Student feedback revealed that although most, if not all, of the students knew that the top of the SG U-tubes is ~25-45% NR level, and the reactor trip setpoint for SG level is 44% WR (which is < 0% NR), they had never heard the information in the second part of the question so they picked the information they had heard before. Basically, the class indicated they would pick an answer they knew was incorrect before they would pick an answer they had never heard before. Question was determined to be valid. Generated CR to LOIT for analysis of training on the basis for ESF / RPS setpoints.
28	44%	Question asked about the pressure at which the Nitrogen backup valve opens/closes and the impact to letdown on a degradation of Instrument Air pressure. 33% of applicants chose distractor A, 4% chose distractor C and 19% chose distractor D. Student feedback revealed that some applicants did not know the pressure at which the Nitrogen Backup Valve re-closed and some did not know the IA pressure at which TV-223 fails closed. Both items are well trained, but not routinely reinforced. Question was determined to be valid.

Question #	Success Rate	Description
65	30%	Question asked about the method of actuation for STAT-X fire suppression and where a fire in the PCR building will alarm. 7% of applicants chose distractor A and 63% chose distractor D. Student feedback revealed that they were primarily unaware of how the STAT-X fire protection system is actuated (manually or automatically). Information is clear in the lesson plan and sufficiently trained. Question was determined to be valid.
77	33%	Question asked about whether or not the RCS inventory control and core heat removal safety functions were satisfied during a loss of coolant accident. 33% of applicants chose distractor A and 33% chose distractor B. Student feedback revealed that because RCS temperatures were lowering and SI flow was adequate, that cooling was in progress and effective, therefore though the safety function(s) was(were) met. The class also asked if the conditions in the stem were plausible. Stem conditions will be evaluated further to ensure the conditions are physically possible. Question was determined to be valid with the possibility for further enhancement.
84	33%	Question asked about which CIVs are and are not covered by LCO 3.6.3, Containment Isolation Valves. 11% of applicants chose distractor B and 56% chose distractor D. Student feedback revealed a gap in student knowledge regarding what does and does not cause a CIV to be covered by LCO 3.6.3. Generated CR for training to analyze the level of detail in TS training lesson plans for possible enhancement. Question was determined to be valid.

Question #	Success Rate	Description
87	22%	Question asked about the parameters required to be bypassed following a failure of a narrow range pressurizer pressure instrument and the accident that parameter is designed to mitigate. 38% of applicants chose distractor B and 13% chose distractor C. Student feedback revealed that they were unsure about which parameters to bypass because NR pressurizer pressure is an input to DNBR but not to LPD. Those that knew it is not an input to LPD picked the wrong answer for the second part without consideration of the impacts to DNBR. Training on this subject is sufficient, however the style of the question was different than that which the applicants saw during the program. Training will analyze the variety of styles used on programmatic exams as compared to Audit/NRC exams for possible bank question modifications. Question was determined to be valid.
92	44%	Question asked about the minimum number of CETs required to satisfy the PAMI surveillance for each channel of QSPDS. 22% of applicants chose distractor A, 11% chose distractor B, and 44% chose distractor C. Student feedback revealed that they just didn't know the information. Initial license training will analyze for enhanced focus in the training program. Question was determined to be valid.

Question #	Success Rate	Description
97	22%	Question asked about how long a non-standard containment purge is good for and the radiation monitors 33% of applicants chose distractor A, 22% chose distractor C, and 22% chose distractor D. Student feedback revealed that students did not know the standard duration of a non-standard containment purge release permit is 24 hours. They were also unaware of the radiation monitors required to have a current surveillance prior to venting containment. While performance of a containment vent is on the SRO qualification card, training will analyze whether or not classroom training on this subject requires enhancement. Question was determined to be valid.

All questions missed by any candidate have been reviewed and there are no other issues identified with any other questions.

Administrative Task Assessment

No issues identified.

JPM Assessment

No issues identified.

Scenario Assessment

No generic issues identified. One critical task failed by one crew (hydrogen analyzers failed to be placed in service within 30 minutes from the start of the LOCA)

Written Examination Scores

RO Exam Average (for RO applicants): 86.8%

RO Exam Average (for SRO applicants): 90.2%

RO Exam Average (for all applicants): 87.9%

SRO Exam Average: 78.7%

Overall Exam Average: 87.0%