2010 PERRY NUCLEAR POWER PLANT

INITIAL EXAMINATION

POST EXAM COMMENTS

LETTER DATED JUNE 28, 2010 WITH ATTS. 2, 4 AND 6 ONLY

FENOC

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Perry Nuclear Power Station
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June 28, 2010
L-10-208

10 CFR 55

ATTN: Mr. Dell McNeil
Chief Examiner, Operations Branch, Region III
U. S. Nuclear Regulatory Commission
2443 Warrenville Road, STE 210
Lisle, IL 60532-4352

SUBJECT:
Perry Nuclear Power Plant
Docket No. 50-440, License No. NPF-58
NRC Post-Examination Material, Perry License Class 2008-1

In accordance with the guidance provided in NUREG-1021, Operator Licensing Examination Standards for Power Reactors (Revision 9, Supplement 1), ES-501, Initial Post-Examination Activities, Section C.1, the following materials are submitted in support of the Perry Nuclear Power Plant (PNPP) written operator license examination conducted on June 21, 2010:

1. Graded written examinations (i.e., each applicant's original answer and examination cover sheets) and two clean copies of each applicant's answer sheet
2. Master examination answer key (No changes were made to the examinations during administration and grading.)
3. All questions asked by the applicants during the administration of the examination and the proctor's responses to those questions
4. Substantive comments made by the applicants following the written examination
5. Written Examination Seating Chart
6. Form ES-403-1, Written Examination Grading Quality Checklist

The post-examination performance analysis identified one potential Reactor Operator generic training program weakness (Questions missed by 50 percent or more of the applicants - Question 29), and three potential Senior Reactor Operator generic training program weaknesses (Questions 6, 9, and 19). These potential weaknesses were entered in the Corrective Action Program for further investigation under Condition Report 10-78851.

JUN 3 0 2010

All individuals signed onto Form ES-201-3, Examination Security Agreement have not yet completed the post examination signature. When form ES-201-3, Examination Security Agreement, has been completed, it will be forwarded to you, thus completing the necessary documentation for the PNPP Initial Licensing Examination.

There are no regulatory commitments contained in this letter. If there are any questions or if additional information is required, please contact Mr. Raymond Torres at (440) 280-5277 or Mr. Anthony E. Mueller, Jr. at (440) 280-5535.

Sincerely,

Mark B. Bezilla

Attachments:

1. Graded Written Examinations and Applicant's Answer Sheets
2. Master Examination Answer Key
3. Questions asked and answers given to the applicants during the written examination
4. Substantive comments made by the applicants following the written examination
5. Written examination seating chart
6. Form ES-403-1, Written Examination Grading Quality Checklist

cc: NRC Project Manager wlo attachments
NRC Resident Inspector wlo attachments
NRC Region III Branch Chief wlo attachments
NRC Document Control Desk wlo attachments

Attachment 2
L-10-208

Master Examination Answer Key
(1 page)

Answer Key
Perry LC 2008-01 NRC Exam
June 21, 2010

RO

1	B
2	A
3	C
4	A
5	A
6	B
7	D
8	C
9	A
10	D
11	C
12	A
13	D
14	A
15	C
16	D
17	B
18	D
19	C
20	C
21	B
22	C
23	A
24	C
25	C

26	C
27	C
28	A
29	C
30	D
31	C
32	B
33	D
34	B
35	D
36	D
37	B
38	A
39	B
40	D
41	D
42	B
43	A
44	B
45	B
46	D
47	A
48	C
49	A
50	C

deleted 7/12/10 Am

~~51~~	~~D~~
52	A
53	D
54	B
55	C
56	A
57	D
58	B
59	D
60	D
61	D
62	B
63	A
64	B
65	C
66	B
67	B
68	B
69	B
70	D
71	D
72	C
73	C
74	D
75	C

SRO

1	D
2	A
3	C
4	B
5	A
6	D
7	D
8	B
9	D
10	C
11	B
12	B
13	B
14	C
15	A
16	D
17	C
18	D
19	D
20	B
21	C
22	B
23	B
24	A
25	D

Attachment 4
L-10-208

Substantive comments made by the applicants following the written examination
(20 pages)

Perry Nuclear Power Plant Comments

Question RO #51

1. **Recommendation** – Delete question from exam, there is no correct answer.
2. **Justification -** The question asks what isolation signal would cause a combination of lights to be light on panel 1H13-P622. No single isolation will result in the indications provided in the stem of the question. See Attachment # 1 for details.
3. **References** – Drawings 208-0013-007,008,012,0015
4. **Candidate Docket #** - 55-33395

Question SRO #9

1. **Recommendation** – No changes to the answer key are required.
2. **Justification** – Operations and Training Management do not agree with the Candidate Comments, Justifications and Recommendation. See Attachment #2 for details.

   ARI-H13-P601-0016-H1, DC BUS ED-1-C UNDERVOLTAGE cause of alarm is Bus ED-1-C voltage <110 volts as sensed by 1R42-Q201. The ARI SUBSEQUENT OPERATOR ACTION is to refer to Loss of DC Bus ED-1-C, ONI-R42-3.

   An entry condition parameter for LOSS OF DC BUS ED-1-C, ONI-R42-3, is ED-1-C Bus voltage zero.

   The plant staff does not expect the Control Room Operator to enter ONI-R42-3 for a bus voltage of 90 vdc and answer B is not the correct answer.

3. **References** – TS Table 1.1-1, IOI-1 COLD STARTUP, EPI-A001
4. **Candidate Docket #** - 55-33395

ATTACHMENT #1

QUESTION RO 51

An isolation signal was generated that resulted in the following light indications on panel H13-P622, Div 2 Aux Relay Panel Inboard Valves:

- NS4 MSL DRN ISOL INBD LOGIC TEST B21H-DS1B light on
- NS4 BOP ISOL INBD LOGIC TEST B21H-DS3B light on
- RX WTR SMPL VLV B33-F019 LOGIC TEST B21H-DS7B light off
- RHR ISOLATION INBD LOGIC TEST B21H-DS5B light off

Based on these indications, select the isolation that occurred.

Reference Provided: Picture of panel H13-P622

A. BOP isolation

B. RWCU isolation

C. RHR LOCA isolation

D. RHR Radwaste Valve isolation

	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	223002	A1.01
	Importance Rating	3.5	

1.0 K&A: ABILITY TO PREDICT AND/OR MONITOR CHANGES IN PARAMETERS ASSOCIATED WITH OPERATING THE PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF CONTROLS INCLUDING: SYSTEM INDICATING LIGHTS AND ALARMS

PCIS/Nuclear Steam Supply Shutoff

Explanation: **Answer D** – the RHR Radwaste Valve isolation is Level 3 and 1.68 psig. The light goes out if isolation signal present. The candidate needs to know if the lights are on or off for the isolation.

A – incorrect – the BOP isolation is actuated on Level 2 and 1.68 psig in DW – the light would be off

B – incorrect – the RWCU isolation is actuated on Level 2 and Leak Detection signals – the BOP light would be off if hit L2

C – incorrect – the RHR LOCA isolation is actuated on Level 1 and 1.68 psig in DW – the light would be off

Technical Reference(s): IOI-18 rev 6 and DWGS 208-013-008 rev P & 208-013-012 rev FF	Reference Attached: IOI-18 p 82 and DWGS 208-013-008 & 208-013-012

Proposed references to be provided to applicants during examination: Picture of panel H13-P622

Learning Objective (As available): OT-COMBINED-B21(NS4)-M

Question Source:	Bank #	
	Modified Bank #	
	New	x
Question History:	Previous NRC Exam:	
Question Cognitive Level:	Memory or Fundamental Knowledge	
	Comprehension or Analysis	x
10 CFR Part 55 Content:	55.41	x
	55.43	

Comments: Level of Difficulty = x

Candidate Comments:

1. The question asks what isolation signal would cause a combination of lights to be light on panel 1H13-P622. No single isolation will result in the indications provided in the stem of the question.

Candidate Justifications for answers:

A. Incorrect answer – BOP isolation - A BOP isloation signal (L2/1.68psig) would result in lights DS5 (1.68), DS7B (L2), and DS1B (L2& 1.68 psig) to be extinguished. The question states that DS1B is still lit making this incorrect indications for a BOP isolation signal.

B. Incorrect answer - RWCU isolation – A RWCU isolation signal (L2

C. Incorrect answer – RHR LOCA isolation signal (L/1.68psig) would result in lights

D. **Incorrect answer** – RHR Radwaste Valve isolation (L3/1.68psig) would not result in RX WTR SMPL VLV B33-F019 LOGIC TEST B21H-DS7B light to be extinguished. DS7B is extinguished from a L2/Hi radiation signal.

Note: during question review by the station for question response a typographical error in the question was identified which has no impact on the outcome of the question. The NS4 MSL DRN ISOL INBD LOGIC TEST lamp is B21H-DS3B and the NS4 BOP ISOL INBD LOGIC TEST lamp is B21HDS1B not B21H-DS3B.

The table below shows there is no isolation signal that would result in both lights DS5B and DS7B being extinguished.

	Lamp extinguished			
Signal	DS1B	DS3B	DS5B	DS7B
L1		X		
L2	X			X
L3			X	
DW press 1.68psig	X		X	
Stm Line Hi Rad				X
Low cond vac		X		
Hi stm flow		X		
Low RPV press		X		
Stm tunnel hi temp		X		
Turb bldg hi temp		X		

Recommendation: – Delete question from exam, there is no correct answer.

References – Drawings 208-0013-007,008,012,0015 (see attached)

Operations and Training Management agree with the above Comments, Justifications and Recommendation.

ATTACHMENT #2

QUESTION SRO 9

Given the following conditions:

- D-1-A Voltage 125 VDC
- D-1-B Voltage 100 VDC
- ED-1-A Voltage 100 VDC
- ED-1-B Voltage 0 VDC
- ED-1-C Voltage 90 VDC
- Reactor Coolant Temperature 180F
- All control rods are inserted

Entry into Off-normal instruction(s) __(1)__ is(are) required and, the Emergency Plan classification will be __(2)__.

Reference Provided: EPI-A1 Attachments 1 and 2

	(1)	(2)
A.	ONI-R42-2, LOSS OF DC BUS ED-1-B and ONI-R42-3, LOSS OF DC BUS ED-1-C	ES-1
B.	ONI-R42-2, LOSS OF DC BUS ED-1-B and ONI-R42-3, LOSS OF DC BUS ED-1-C	EU-1
C.	ONI-R42-2, LOSS OF DC BUS ED-1-B	ES-1
D.	ONI-R42-2, LOSS OF DC BUS ED-1-B	EU-1

QUESTION SRO 9

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295004	2.4.11
	Importance Rating		4.2

K&A: Knowledge of abnormal condition procedures.

Partial or Total Loss of DC Pwr / 6

Explanation: **Answer D** – the Entry Condition for all R42 ONI's is Bus Voltage zero. The other 'entry conditions' in the ONI describe the effects of the loss of the DC bus. Therefore, only ONI-R42-2 should be entered. Additionally, Since the Plant is in Mode 4, EU-1 is the correct E-plan classification. With only Rx coolant temperature given, TS Table 1.1-1 indicates the Plant is in Mode 4

A & B – incorrect – voltage on ED-1-C is greater than the ONI-R42-3 Entry Condition voltage

A & C – incorrect – ES-1 would be correct if plant was in Mode 1, 2, or 3.

Technical Reference(s): ONI-R42-2 rev 6 & EPI-A001 rev 21	Reference Attached: ONI-R42-2 p 3 & EPI-A001 p 14

Proposed references to be provided to applicants during examination: EPI-A1 Attachments 1 and 2

Learning Objective (As available): OT-3035-05(LP)-A.2

Question Source:	Bank #	
	Modified Bank #	
	New	x
Question History:	Previous NRC Exam:	
Question Cognitive Level:	Memory or Fundamental Knowledge	
	Comprehension or Analysis	x
10 CFR Part 55 Content:	55.41	
	55.43b.5	x

Comments: Level of Difficulty = x

Candidate Comment (Docket 55-33395) :

1. The questions asks the Entry Condition for R42 ONI's and the correct E-plan classification for the prescribed conditions. Candidate believes the Control Room Operator would enter ONI-R42-3 due to the low voltage (90vdc) on bus ED-1-C.

Candidate Justifications for answers:

A. Incorrect answer – ES-1 would be correct if plant was in Mode 1, 2, or 3
B. Correct answer - Voltage on ED-1-B is 0 vdc and voltage on ED-1-C is degraded so the Control Room Operator would enter both ONI-R42-2 and ONI-R42-3. Since the Plant is in Mode 4, EU-1 is the correct E-plan classification.
C. Incorrect answer – ES-1 would be correct if plant was in Mode 1, 2, or 3
D. Incorrect answer – the Control Room Operator would enter both ONI-R42-2 and ONI-R42-3

Recommendation: Amend the Answer Key to list 'Answer B' as the correct answer.

References: ARI-H13-P601-0016-H1, ONI-R42-3

Operations and Training Management do not agree with the above Comments, Justifications and Recommendation.

ARI-H13-P601-0016-H1, DC BUS ED-1-C UNDERVOLTAGE cause of alarm is Bus ED-1-C voltage <110 volts as sensed by 1R42-Q201. The ARI SUBSEQUENT OPERATOR ACTION is to refer to Loss of DC Bus ED-1-C, ONI-R42-3.

An entry condition parameter for LOSS OF DC BUS ED-1-C, ONI-R42-3, is ED-1-C Bus voltage zero.

The plant staff does not expect the Control Room Operator to enter ONI-R42-3 for a bus voltage of 90 vdc and answer B is not the correct answer.

LOSS OF DC BUS ED-1-C

Effective Date: 11-13-03

Preparer: Derrick Kaopuiki / 7-21-03
Date

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ENTRY CONDITIONS

Alarms

None

NOTE
Loss of ED-1-C causes loss of power to Division 3 optical isolators listed in Plant Data Book entry PDB-H003 and their associated annunciator alarms. Pre-existing alarms will extinguish.

Parameters

- The changes in plant parameters will vary depending on the operating condition of the loads being supplied at the time the bus is lost. See Plant Data Book entry PDB-H0003.
- ED-1-C Bus voltage zero.
- Loss of flow, pressure, and level indication for the systems as listed in Plant Data Book entry PDB-H003.
- Loss of control power for breakers on EH13 listed in Plant Data Book entry PDB-H0003.
- HPCS PUMP MIN FLOW VALVE, 1E22-F012, opens.
- If the High Pressure Core Spray (HPCS) suction is on the CST, the CST will gravity drain to the Suppression Pool.

AUTOMATIC ACTIONS

None

IMMEDIATE ACTIONS

None

SUPPLEMENTAL ACTIONS

CAUTION
The supply and load breakers on EH13 will lose their remote control and automatic trip functions. Due to the loss of automatic relay functions, the Unit Supervisor should evaluate the need to strip supply buses to protect them from electrical faults.

- ❑ **VERIFY** High Pressure Core Spray (HPCS) suction is from the Suppression Pool.
- ❑ **REFER TO** SOI-R42 (DIV 3) and **RESTORE** power to ED-1-C.

REFER TO the following applicable Technical Specifications:

- ❑ • 3.5, Emergency Core Cooling Systems and Reactor Core Isolation Cooling System
- ❑ • 3.6.1.3, Primary Containment Isolation Valves
- ❑ • 3.8, Electrical Power Systems

DECLARE the following systems INOPERABLE:

- ❑ • Division 3 Diesel Generator
- ❑ • High Pressure Core Spray (HPCS)
- ❑ • HPCS PUMP MIN FLOW VALVE, for containment isolation 1E22-F012

CAUTION

To prevent motorizing the generator, the Div 3 Diesel Generator output breaker must be tripped locally (at the switchgear) before the diesel is secured.

NOTE

Once the Div 3 Diesel is secured, it cannot be restarted due to lack of DC control power. The following Diesel Generator controls are lost:

- Diesel Generator Governor control.
- Diesel Generator Voltage Regulator.
- All Generator automatic trips except overspeed.
- Remote operation of Generator breaker.
- Remote shutdown of the Diesel.

N/A	The Division 3 Diesel Generator is **NOT** required as a source of emergency power.		
	The Unit Supervisor directs shutdown of the Division 3 Diesel Generator.		
	THEN SHUTDOWN the Diesel as follows:		
❑	**STATION** an Operator locally at the Diesel Generator Output Breaker in direct communication with the Control Room.	EH 1301	
❑	**ESTABLISH** direct communication with the Operator in the Diesel Generator Room.		
❑	**DIRECT** the Operator at the switchgear to manually open the Diesel Generator Output Breaker.		EH 1301
❑	**DIRECT** the Diesel Generator Operator to shutdown the Diesel by pulling the fuel rack override lever (mounted on the Diesel Engine near the governor) away from the engine.		
N/A	The HPCS Pump is running.	1E22-C001	
	The Unit Supervisor directs shutdown of the HPCS Pump.		
	THEN PERFORM one **OR** both of the following:		
❑	• **DIRECT the operator at the switchgear to manually open** 1E22-C001 HPCS PUMP breaker.	EH 1304	

❑	• **CLOSE** the HPCS INJECTION VALVE.	1E22-F004
❑	**REFER TO** PDB-H003, for a more detailed list of affected loads from Bus ED-1-C.	
❑	**REFER TO** with EPI-A1 and **DETERMINE** if an Emergency (EAL) has been exceeded.	

REFERENCES

- Commitment B00081 Sec. 4.0 (Caution)

RECORDS

The following records are completed/generated by this document:

Quality Assurance Records

None

Non-Quality Assurance Records

None

SCOPE OF REVISION

Rev. 6

1. Reformatted in accordance with OAI-0502.
2. Revised in entirety, no revision bars used.
3. Modified Step 4.6 based on review comment per POS direction. 1 additional PCR.

ATTACHMENTS

None

CAUSE OF ALARM

Bus ED-1-C voltage <110 volts as sensed by 1R42-Q201.

Low bus voltage could be caused by charger malfunction or excessive use of battery.

AUTOMATIC ACTION

None

IMMEDIATE OPERATOR ACTION

None

SUBSEQUENT OPERATOR ACTION

❑	**REFER TO** Loss of DC Bus ED-1-C ONI-R42-3.	
NA ❑	**IF** DIV 3 DC VOLTS BATTERY, decreases to <110 volts, **THEN PERFORM** SVI-R42-T5221.	1R42-R020C
NA ❑	**IF** the In-service Normal Charger is malfunctioning, **THEN REFER TO** SOI-R42 (Div 3) and **PLACE** the Reserve Charger in service.	EFD-1-C EFD-12-C
NA ❑	**IF** the In-service Reserve Charger is malfunctioning, **THEN REFER TO** SOI-R42 (Div 3) and **PLACE** the Normal Charger in service.	EFD-12-C EFD-1-C
❑	**REFER TO** SOI-R42 (Div 3) and **VERIFY** the in-service charger is set to the proper float voltage.	

END OF SECTION

REFERENCES

- 3.8.4, DC Sources - Operating
- 3.8.5, DC Sources - Shutdown
- 208-222, Sht. 281
- 208-215, Sht. 22
- 1R42Q0201

Attachment 6
L-10-208

Form ES-403-1, Written Examination Grading Quality Checklist
(1 page)

Facility: Perry Date of Exam: 6-21-2010 Exam Level: RO ✓ SRO ✓

Item Description	Initials a	Initials b	Initials c
1. Clean answer sheets copied before grading	RJT	DW	DM
2. Answer key changes and question deletions justified and documented	RJT	DW	DM
3. Applicants' scores checked for addition errors (reviewers spot check > 25% of examinations)	RJT	DW	DM
4. Grading for all borderline cases (80 ±2% overall and 70 or 80, as applicable, ±4% on the SRO-only) reviewed in detail	RJT	DW	DM
5. All other failing examinations checked to ensure that grades are justified	RJT	DW	DM
6. Performance on missed questions checked for training deficiencies and wording problems; evaluate validity of questions missed by half or more of the applicants	RJT	DW	DM

	Printed Name/Signature	Date
a. Grader	Raymond J Torres	6/25/10
b. Facility Reviewer(*)	David W O'Donnell	6-25-10
c. NRC Chief Examiner (*)	Dell R. McNeil / Dell R. McNeil	7/12/10
d. NRC Supervisor (*)	Hironori Peterson / Hironori Peterson	7/29/10

(*) The facility reviewer's signature is not applicable for examinations graded by the NRC; two independent NRC reviews are required.