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Clifford Chapin
Manager, Training & Development

NL-18-068

September 5, 2018

Mr. David Lew
Regional Administrator
Region I
U.S. Nuclear Regulatory Commission
2100 Renaissance Blvd Suite 100
King of Prussia, Pennsylvania 19406-2713

Subject: Indian Point Unit 2 Initial Licensed Operator Examination Outline
Indian Point Unit 2
Docket No. 50-247
DPR-26

Dear Sir;

In preparation for the Indian Point Unit 2 Reactor Operator and Senior Reactor Operator initial licensing examinations, scheduled to start on February 4, 2019, Entergy Nuclear Operations, Inc. (Entergy) is providing the enclosed Reactor Operator and Senior Reactor Operator Written Examination Outlines to Mr. Peter Presby of your staff. The examination outlines are being provided in accordance with the instructions of NUREG-1021, "Operator Licensing Examination Standards for Nuclear Power Reactors," Rev 11.

In accordance with 10 CFR 55.49 and the Examination Security and Integrity Considerations in Examiner Standard ES-201, Attachment 1, the attached materials should be withheld from public disclosure until after the examinations are complete.

Entergy is making no commitments in this letter. Should you have any questions regarding this matter, please contact Mr. Charles Kocsis, Superintendent, ILO Operations Training (914) 254-2065, Mr. Tim Jenkins, Senior Instructor Examination author at (914) 254-2995 or Mr. Robert Suneson, Senior Instructor Examination author at (914) 254-2635.

Sincerely,

A handwritten signature in black ink, appearing to read "C. Chapin".
CHLFFORD S. CHAPIN

Clifford S. Chapin
Manager, Training and Development

Signed per NUREG 1021, ES-201, C.1.g

A handwritten signature in black ink, appearing to read "David Schepperly".
David Schepperly, Facility Representative

Enclosures:

- NUREG-1021, Rev. 11, Form ES-201-2, "Examination Security Agreement"
- NUREG-1021, Rev. 11, Form ES-201-2, "Examination Outline Quality Checklist"
- NUREG-1021, Rev. 11, Form ES-301-1, "RO Administrative Topics Outline"
- NUREG-1021, Rev. 11, Form ES-301-1, "SRO Administrative Topics Outline"
- NUREG-1021, Rev. 11, Form ES-301-2, "RO Control Room/In-Plant Systems Outline"
- NUREG-1021, Rev. 11, Form ES-301-2, "SRO-I Control Room/In-Plant Systems Outline"
- NUREG-1021, Rev. 11, Form ES-301-5, "Transient and Event Checklist"
- NUREG-1021, Rev. 11, Form ES-D-1, "Scenario 1 Outline"
- NUREG-1021, Rev. 11, Form ES-D-1, "Scenario 2 Outline"
- NUREG-1021, Rev. 11, Form ES-D-1, "Scenario 3 Outline"
- NUREG-1021, Rev. 11, Form ES-D-1, "Scenario 4 Outline"
- NUREG-1021, Rev. 11, Form ES-D-1, "Scenario 5 Outline"
- NUREG-1021, Rev. 11, Form ES-401-2, "PWR Examination Outline" - RO/SRO
- NUREG-1021, Rev. 11, Form ES-401-3, "Generic Knowledge and Abilities Outline"- RO/SRO
- NUREG-1021, Rev. 11, Form ES-401-4, "Record of Rejected K/As" - RO/SRO
- Operating Test Schedule (Preliminary)
-

cc:

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Operating test schedule

| Position | Day 1 | Day 2 | Day 3 | Day 4 |
|----------|------------|------------|------------|------------|
| | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 |
| CRS | SRO11 | SRO13 | SRO14 | SRO14 |
| ATC | RO1 | RO5 | RO2 | SRO13 |
| BOP | RO2 | RO3 | RO1 | RO1 |
| CRS | SRO12 | SRO16 | SRO15 | SRO11 |
| ATC | RO3 | SRO11 | RO4 | SRO16 |
| BOP | RO4 | SRO15 | RO3 | RO4 |
| CRS | SRO13 | SRO12 | SRO17 | SRO17 |
| ATC | SRO14 | SRO17 | SRO12 | SRO15 |
| BOP | RO5 | RO2 | SRO16 | RO5 |

7 SRO-I candidates

5 RO candidates

Facility: IPEC Unit 2Date of Examination: 2/4/2019Examination Level: RO ☒ SRO ☐Operating Test Number: 1

| Administrative Topic (see Note) | Type Code* | Describe activity to be performed |
|---------------------------------|------------|---|
| Conduct of Operations | M | NA ROs |
| Conduct of Operations | N | Prepare Reactivity Balance Load Change 1940012125 RO 3.9 SRO 4.2 |
| Equipment Control | N | Review a Check Off List 1940012214 RO – 3.9 SRO – 4.3 |
| Radiation Control | M | Prepare a Gaseous Waste Release Permit 1940012311 RO – 3.8 SRO – 4.3 |
| Emergency Plan | M S | Perform initial NUE Notifications 1940012443 RO – 3.2 SRO – 3.8 |

NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).

* Type Codes and Criteria:

(C)ontrol room, (S)imulator, or Class(R)oom
 (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs and RO retakes)
 (N)ew or (M)odified from bank (≥ 1)
 (P)revious 2 exams (≤ 1 , randomly selected)

Facility: IPEC Unit 2Date of Examination: 2/4/2019Examination Level: RO ☐ SRO ☒Operating Test Number: 1

| Administrative Topic (see Note) | Type Code* | Describe activity to be performed |
|---------------------------------|------------|--|
| Conduct of Operations | M | Spent Fuel Pit Loading 1940012142 RO – 2.5 SRO – 3.4 |
| Conduct of Operations | N | Review Reactivity Balance Load Change 1940012125 RO 3.9 SRO 4.2 |
| Equipment Control | N | Review a Check Off List 1940012214 RO – 3.9 SRO – 4.3 |
| Radiation Control | M | Review a Gaseous Waste Release Permit 1940012311 RO – 3.8 SRO – 4.3 |
| Emergency Plan | M | Classify Event and Complete Form EP-1, Part 1 1940012441 RO – 2.9 SRO – 4.6 |

NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).

* Type Codes and Criteria: (C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs and RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1 , randomly selected)

Facility: IPEC Unit 2

Date of Examination: 2-4-2019

Exam Level: RO ☒ SRO-I ☐ SRO-U ☐

Operating Test Number: 1

Control Room Systems: 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U

| System/JPM Title | Type Code* | Safety Function |
|--|------------|-----------------|
| a. Retrieve A Dropped Rod 001000A408 RO – 3.7 SRO – 3.4 | S A N | 1 |
| b. Place Excess Letdown In Service 004000A406 RO – 3.6 SRO – 3.1 | S D | 2 |
| c. Depressurize the RCS to Refill the Pressurizer 006000A409 RO – 4.1 SRO – 4.2 | S A E N | 3 |
| d. Start RCP FR-C.1 003000A402 RO – 2.9 SRO – 2.9 | S E N D | 4P |
| e. Manually Actuate Containment Spray 026000A401 RO – 4.5 SRO – 4.3 | S A D | 5 |
| f. Swap 6.9 Bus 6 from 138kV to 13.8 kV 062000A401 RO – 3.3 SRO – 3.1 | S N | 6 |
| g. PT 404 Failure at the point of adding heat 016000A201 RO – 3.0 SRO – 3.1 | S A L N | 7 |
| h. Terminate Containment Pressure Relief 029000A301 RO – 3.8 SRO – 4.0 | S M | 8 |

In-Plant Systems: 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U

| | | |
|---|-------|----|
| i. Locally Start 22 AFW Pump 0610002130 RO – 4.4 SRO – 4.0 | E D | 4S |
| j. Lineup Backup Cooling to Charging Pumps 0080002130 RO – 4.4 SRO – 4.0 | R E D | 8 |
| k. Swap Gas Decay Tanks 071000A405 RO – 2.6 SRO – 2.6 | N A R | 9 |

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all five SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.

| | |
|--------------|-----------------------------|
| * Type Codes | Criteria for R /SRO-I/SRO-U |
|--------------|-----------------------------|

| | |
|--|--|
| (A)lternate path | 4-6/4-6 /2-3 |
| (C)ontrol room | |
| (D)irect from bank | $\leq 9/\leq 8/\leq 4$ |
| (E)mergency or abnormal in-plant | $\geq 1/\geq 1/\geq 1$ |
| (EN)gineered safety feature | $\geq 1/\geq 1/\geq 1$ (control room system) |
| (L)ow-Power/Shutdown | $\geq 1/\geq 1/\geq 1$ |
| (N)ew or (M)odified from bank including 1(A) | $\geq 2/\geq 2/\geq 1$ |
| (P)revious 2 exams | $\leq 3/\leq 3/\leq 2$ (randomly selected) |
| (R)CA | $\geq 1/\geq 1/\geq 1$ |
| (S)imulator | |

Facility: IPEC Unit 2Date of Examination: 2-4-2019Exam Level: RO ☐ SRO-I ☒ SRO-U ☐Operating Test Number: 1

Control Room Systems: 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U

| System/JPM Title | Type Code* | Safety Function |
|--|------------|-----------------|
| a. Retrieve A Dropped Rod 001000A408 RO – 3.7 SRO – 3.4 | S A N | 1 |
| b. NA SRO | | |
| c. Depressurize the RCS to Refill the Pressurizer 006000A409 RO – 4.1 SRO – 4.2 | S A E N | 3 |
| d. Start RCP FR-C.1 003000A402 RO – 2.9 SRO – 2.9 | S E N D | 4P |
| e. Manually Actuate Containment Spray 026000A401 RO – 4.5 SRO – 4.3 | S A D | 5 |
| f. Swap 6.9 Bus 6 from 138kV to 13.8 kV 062000A401 RO – 3.3 SRO – 3.1 | S N | 6 |
| g. PT 404 Failure at the point of adding heat 016000A201 RO – 3.0 SRO – 3.1 | S A L N | 7 |
| h. Terminate Containment Pressure Relief 029000A301 RO – 3.8 SRO – 4.0 | S N | 8 |

In-Plant Systems: 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U

| | | |
|---|-------|----|
| i. Locally Start 22 AFW Pump 0610002130 RO – 4.4 SRO – 4.0 | E D | 4S |
| j. Lineup Backup Cooling to Charging Pumps 0080002130 RO – 4.4 SRO – 4.0 | R E D | 8 |
| k. Swap Gas Decay Tanks 071000A405 RO – 2.6 SRO – 2.6 | N A R | 9 |

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all five SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.

* Type Codes

Criteria for R /SRO-I/SRO-U

| | |
|--|--|
| (A)lternate path | 4-6/4-6 /2-3 |
| (C)ontrol room | |
| (D)irect from bank | $\leq 9/\leq 8/\leq 4$ |
| (E)mergency or abnormal in-plant | $\geq 1/\geq 1/\geq 1$ |
| (EN)gineered safety feature | $\geq 1/\geq 1/\geq 1$ (control room system) |
| (L)ow-Power/Shutdown | $\geq 1/\geq 1/\geq 1$ |
| (N)ew or (M)odified from bank including 1(A) | $\geq 2/\geq 2/\geq 1$ |
| (P)revious 2 exams | $\leq 3/\leq 3/\leq 2$ (randomly selected) |
| (R)CA | $\geq 1/\geq 1/\geq 1$ |
| (S)imulator | |

Appendix D

Scenario Outline

Form ES-D-1

Facility: IPEC Unit 2 Scenario No.: 1 Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions: Reset simulator to 100% power IC Load Simulator Schedule-Scenario1

Turnover # 22 ABFP has been out-of-service for bearing oil line repair for 4 hours. It is expected back within the next 6 hours (ITS 3.7.5 – 72 hr AOT). 21 and 23 ABFP are protected equipment.

Critical Tasks:

WOG E-0-A: Manually trip reactor from the CCR before completing E-0, Step 1.

WOG E-0-P: Manually actuate Main Steam isolation before transition out of E-0

Manually start SI system pumps before transition out of E-0.1

| Event No. | Malf. No. | Event Type* | Event Description |
|--|----------------------------------|--|-------------------------------------|
| 1 | LOA- EPS182 | C (ATC) C (CRS) C (BOP) TS(CRS) | 24 instrument bus |
| 2 | MAL- NIS004A | (ATC) I(CRS) I (BOP) TS(CRS) | NI-41 fails low |
| 3 | - | R (ATC) N (CRS) N (BOP) | Tech Spec Power reduction |
| 4 | RLY- GEN007 | M(ATC) M(CRS) M(BOP) | Main Generator output breakers trip |
| 5 | RLY- PPL426- 461 | C(ATC) C(CRS) C(BOP) | Auto Reactor Trip Failure |
| 6 | MAL- SGN005 | M(ATC) M(CRS) M(BOP) | Steam Break in Turbine Hall |
| 7 | RLY- PPL501 RLY- PPL502 | C (CRS) C (BOP) | Auto closure MSIVs blocked |
| 8 | SWI- SGS002 | C (CRS) C (BOP) | Phase A reset failure |
| 9 | AOV- RCS003A | C (ATC) C (CRS) | PRZR PORV Fails open |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor | | | |

The scenario begins with the plant at 100% power with 22 Auxiliary Feedwater pump out of service expected to return in 6 hours. The team will assume the watch and 24 Instrument bus will be deenergized. The team will enter and perform the actions of 2-AOP-IB-1 "Loss of Instrument Bus". When the BOP initiates attachment 5, N-41 will fail low. The instrument bus will not be recovered during the scenario

With the failure of NI-41 the team may enter 2-AOP-INST-1 or 2-AOP-NI-1 and determine that the channel cannot be removed from service and requires a Tech Spec shutdown.

The team will then commence shutdown using 2-POP-2.1. The ATC will borate and drive rods in manual (or at least monitor automatic insertion). The BOP will lower turbine power using the manual governor

When the team has demonstrated enough of the shutdown evolution, the output breakers on the generator trip open. An automatic trip will not occur, manual trip will be successful. When the turbine overpeeds, a steam line in the turbine building will break. Automatic steam line isolation will not actuate. The team will manually close the MSIVs to stop the steam leak.

The team will progress through 2-E-0, E-2, E-1 to ES-1. Phase A will not reset requiring the key switches to reset Phase A. When SI is terminated PCRV PCV-456 will fail open and its associated block valve will blow a fuse when closing. The team will restart the Safety Injection system pumps and transition back to 2-E-1.

Facility: Indian Point 2 Scenario No.: 2 Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions: 100% power. 21 Charging Pump and 21 CCW Pump are out of service.

Turnover: After taking the watch, the team will be directed to perform a 2 hour shutdown in accordance with AOP-RSD-1 due to steam leak on 21 SG non-return check valve.

Critical Tasks:

WOG E-0-D: Manually actuate at least one train of SIS-actuated safeguards before any of the following: Transition to any E-1 series, E-2 series, or E-3 series procedure or transition to any FRP.

WOG E-2-A: Isolate the faulted SG before transition out of E-2.

WOG ECA-3.1-B: Cool down the RCS to CSD conditions at the highest achievable rate not exceeding 100F/hr

| Event No. | Mal. No. | Event Type* | Event Description |
|-----------|----------------|---|--|
| 1 | XMT-RCS020A | (ATC) (I)(BOP) (I)(CRS) TS (CRS) | LT-460 (Pressurizer Level) falls low. |
| 2 | | N (CRS) N (BOP) R (ATC) C (CRS) | Downpower |
| 3 | MAL-CRF002AV | C (ATC) TS(CRS) | R50 P-6 ratchets in due to malfunctioning movable gripper. |
| 4 | MAL-SGN004A | M (ATC) M (BOP) M (CRS) | Steam line rupture with failure of 23 MSIV to close. |
| 5 | RLY-PPL487/488 | C (ATC) C (CRS) | Failure of SI to actuate automatically. |
| 6 | MOC-AFW001 | C (ATC) | Failure of 21 AFW to autostart. |
| 7 | MAL-RCS014C | M (ATC) M (BOP) M (CRS) | 23 SGTR |
| | | | |
| | | | |

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario 2 Summary

The scenario begins with the plant at 100% power with 21 Charging Pump and 21 CCW Pump out of service. The team will assume the watch and be directed to remove the unit from service within 2 hours using 2-AOP-RSD-1 (Rapid Shutdown) due to 21 SG non-return check valve having a steam leak.

While the team is preparing to shut down, LT-460 (controlling PZR level transmitter) will fail low. This will cause charging pump speed to increase and letdown to isolate. The team will respond by placing the running charging pump in manual. AOP-INST-1 (Instrument and Controller Failures) will be entered. The failed channel will be defeated and letdown restored.

The team will then commence shutdown using 2-AOP-RSD-1. The ATC will borate and drive rods in manual (or at least monitor automatic insertion) and the BOP will lower turbine power using the manual governor.

Control Rod P-6 will ratchet into the core during rod motion due to a movable gripper failure. This will require the load reduction to be stopped and the condition evaluated per 2-AOP-ROD-1 (Rod Control Malfunctions).

After load reduction is resumed a Steam Line Rupture downstream of the MSIVs will occur requiring a reactor trip and closure of the MSIVs (AOP-UC-1 may be used). 23 MSIV will not close. SI will not automatically actuate. When SI is manually actuated, a SGTR will occur in 23 SG. 21 AFW pump will not autostart, the ATC will take action to feed 21 and 22 SGs with 21 AFP or start 22 AFP.

The team will transition to E-2 due to 23 SG pressure decreasing in an uncontrolled manner, and 23 SG will be isolated. The team will diagnose that 23 SG is now ruptured and transition to E-3.

Procedure flow path: AOP-INST-1, AOP-RSD-1, AOP-ROD-1, AOP-UC-1, E-0, E-2, E-3, ECA-3.1

Appendix D

Scenario Outline

Form ES-D-1

Facility: IPEC Unit 2 Scenario No.: 3 Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions: Initialize to 100% power IC

Turnover: No equipment OOS

Critical Tasks:

WOG FR-H.1 A: Establish RCS bleed and feed when the average of the three lowest SG levels reach 20% WR.

WOG FR-H.1 E: Establish greater than 400 gpm flow to the SGs before exiting FR-H.1.

| Event No. | Malf. No. | Event Type* | Event Description |
|--|--------------------------|---------------------------------------|---|
| 1 | XMT-CFW005 A | I(ATC) I(CRS) I(BOP) TS(CRS) | 21 SG Feed Flow Controlling Channel fails low |
| 2 | XMT-FHW015 A | C(ATC) C(BOP) C(CRS) | 21 and 22 Heater Drain Pumps trip |
| 3 | NA | R(ATC) N(BOP) N(CRS) TS(CRS) | Power reduction and stabilization |
| 4 | FLX-CFW038 | M(ATC) M(BOP) M(CRS) | Feed line break in the ABFP Building (Effects ALL SG) |
| 5 | MOC-AFW001 MOC-AFW002 | C(ATC) | 21 and 22 Motor driven AFW pumps fail to operate, 22 AFP is started |
| 6 | CVH-ATS019B | M(ATC) M(BOP) M(CRS) | 22 AFW pump trips on overspeed after flow is established |
| 7 | MOC-SIS002 MOC-SIS003 | C(BOP) | 21 and 22 SIP fail to auto start |
| | | | |
| | | | |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor | | | |

The scenario begins with the plant at 100% power no equipment out of service. The team will assume the watch and 21 SG controlling feed flow channel (B) will fail low. The ATC will transfer Steam flow and Feed Flow channels to A to restore feedwater flow. The team will progress through 2-AOP-INST-1 and remove the channel from service (If evaluator requires). Once the channel is removed from service both heater drain tank pumps will trip due to a level failure on the heater drain tank.

The team will take actions in accordance with 2-AOP-FW-1 and reduce power to restore feedwater flow greater than steam flow. Once the plant is stable the team will determine a power reduction to approx. 400MW is required to close the 10" heater drain tank dumps. The team will commence a power reduction per 2-POP-2.1.

Once the power reduction is commenced a feed line break in the ABFP Building will occur affecting all SG's. The ATC will recognize the reduction in feedwater flow and trip the reactor and close the MBFP discharge valves in accordance with 2-AOP-FW-1. Both motor driven auxiliary feedwater pumps will not function requiring the turbine driven (22) auxiliary feedwater pump to be aligned to feed all steam generators. When the 22 AFP turbine speed is raised the pump will trip.

The team will transition to 2-FR-H.1 due to less than 400 gpm to the SG's. When the 3 lowest SG's average wide range level decreases to less than 20% the team will initiate feed and bleed. 21 and 22 Safety injection pumps will not start when SI is actuated and will be manually started. After the bleed path has been established 22 AFP will be restored and the team will feed the required SG(s). Once feed flow has been established the scenario is terminated.

Facility: IPEC Unit 2 Scenario No.: 5 Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions: Initialize to 100% power IC

Turnover 21 EDG OOS LCO 3.8.1.b, day 6 of 7 day LCO. 21 EDG is in the progress of testing and is tied to bus 5a and fully loaded.

Critical Tasks:

Establish at least 400 gpm AFW flow to the SGs before SG WR level decreases below 14%.

Manually start ESW pump(s) such that the EDG does not fail due to engine overheating.

| Event No. | Malf. No. | Event Type* | Event Description |
|-----------|---------------------------|---|---|
| 1 | XMT-MSS053A | I (ATC) I (BOP) I (CRS) TS (CRS) | Turbine First Stage Pressure (PT-412A) fails low |
| 2 | MOT-CNM012A | C (BOP) TS (CRS) | 25 FCU Trip |
| 3 | BST-DSG034A | | 21 EDG trip during monthly testing (Low oil pressure) |
| 4 | | R (ATO) N (CRS) N (BOP) TS (CRS) | Tech Spec shutdown due to inoperable EDG and FCU |
| 5 | XMT-CFW037A | M (ATC) M (BOP) M (CRS) | PT-404B (MBFP Suction pressure) fails low |
| 6 | MAL-EPS006E BKR-DSG004 | C (BOP) | 6.9kv bus 5 faults when the Unit trips, 23 EDGs output breaker does not automatically close |
| 7 | BST-DSG037A | M (ATC) M (BOP) M (CRS) | 22 EDG trips on overcrank |
| 8 | MOC-SWS008 | C (BOP) | 23 Service Water pump does not autostart on powering 6a from 23 EDG |
| | | | |

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

The team will assume the watch with 21 EDG in the progress of testing to exit the 7 day LCO 3.8.1.b. PT-412a will fail low, rods will auto insert and be subsequently stopped by the ATC. The team will perform the actions of 2-AOP-INST-1 and restore rods to their position prior to the malfunction, and remove the channel from service.

Once the channel is removed from service 25 CRF will trip on overcurrent, the team will take ARP/SOP actions to secure 25 CRF. When 25 CRF is removed from service 21 EDG will trip on low oil pressure. The NPO will notify the control room of the low oil pressure trip on 21 EDG and that there is oil in the sump under 21 EDG. The CRS will determine that with the EDG and CRF out of service they do not meet LCO 3.6.6 and that they require a 3.0.3 shutdown.

The team will commence a 2-POP-2.1 shutdown to place the Unit mode 3 in 7 hours. When the required reactivity manipulation is completed PT-408B will fail low, reducing the speed on MBFP and the team take actions in accordance with 2-AOP-INST-1 and manually trip the reactor. When the reactor trips 6.9kv bus 5 faults, deenergizing 6.9Kv Buses 5, 1 and 2 and 480v bus 5a, none of which can have power restored. 22 EDG fails to start due to overcrank, this deenergizes busses 2a and 3a. 23 EDG output breaker does not close in auto.

The team will perform the immediate actions of 2-E-0 and at step 3 enter ECA-0.0. 480v bus 6a may be restored by ARP action or step 6 of ECA-0.0 and 23 Service water pump is started and return to 2-E-0 and transition to ES-0.1 when the scenario will be terminated.

Facility: IPEC

Printed: 09/04/2018

Date Of Exam: 02/04/2019

| Tier | Group | RO K/A Category Points | | | | | | | | | | | | SRO-Only Points | | | | |
|---|----------------|------------------------|----|----|-----|----|----|----|----|-----|----|----|-------|-----------------|---|----|-------|---|
| | | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G* | Total | A2 | | G* | Total | |
| 1. Emergency & Abnormal Plant Evolutions | 1 | 0 | 0 | 0 | N/A | | | 0 | 0 | N/A | | | 0 | 0 | 3 | | 3 | 6 |
| | 2 | 0 | 0 | 0 | | | | 0 | 0 | | | | 0 | 0 | 2 | | 2 | 4 |
| | Tier Totals | 0 | 0 | 0 | | | | 0 | 0 | | | | 0 | 0 | 0 | 5 | | 5 |
| 2. Plant Systems | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | | 2 | 5 | |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 3 | |
| | Tier Totals | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | | 3 | 8 | |
| 3. Generic Knowledge And Abilities Categories | | | | | 1 | | 2 | | 3 | | 4 | | 0 | 1 | 2 | 3 | 4 | 7 |
| | | | | | 0 | | 0 | | 0 | | 0 | | | 1 | 2 | 2 | 2 | |

Note:

1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ± 1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
- 7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

PWR SRO Examination Outline

Printed: 09/04/2018

Facility: IPEC

ES - 401 Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1 Form ES-401-2

| E/APE # / Name / Safety Function | K1 | K2 | K3 | A1 | A2 | G | KA Topic | Imp. | Points |
|---|----------|----------|----------|----------|----------|----------|---|----------|--------|
| 000015/000017 RCP Malfunctions / 4 | | | | | | X | 2.1.20 - Ability to interpret and execute procedure steps. | 4.6 | 1 |
| 000026 Loss of Component Cooling Water / 8 | | | | | | X | 2.1.19 - Ability to use plant computers to evaluate system or component status. | 3.9 | 1 |
| 000056 Loss of Off-site Power / 6 | | | | | X | | AA2.45 - Indicators to assess status of ESF breakers (tripped/not-tripped) and validity of alarms (false/not-false) | 3.9 | 1 |
| 000062 Loss of Nuclear Svc Water / 4 | | | | | X | | AA2.04 - The normal values and upper limits for the temperatures of the components cooled by SWS | 2.9* | 1 |
| 000065 Loss of Instrument Air / 8 | | | | | X | | AA2.06 - When to trip reactor if instrument air pressure is decreasing | 4.2 | 1 |
| 000077 Generator Voltage and Electric Grid Disturbances / 6 | | | | | | X | 2.1.32 - Ability to explain and apply system limits and precautions. | 4.6 | 1 |
| K/A Category Totals: | 0 | 0 | 0 | 0 | 3 | 3 | Group Point Total: | 6 | |

PWR SRO Examination Outline

Printed: 09/04/2018

Facility: IPEC

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-2

| E/APE # / Name / Safety Function | K1 | K2 | K3 | A1 | A2 | G | KA Topic | Imp. | Points |
|---|----------|----------|----------|----------|----------|----------|--|------|--------|
| 000061 ARM System Alarms / 7 | | | | | X | | AA2.03 - Setpoints for alert and high alarms | 3.3 | 1 |
| 000069 Loss of CTMT Integrity / 5 | | | | | | X | 2.2.36 - Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations. | 4.2 | 1 |
| W/E02 SI Termination / 3 | | | | | X | | EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments | 4.0 | 1 |
| W/E13 Steam Generator Over-pressure / 4 | | | | | | X | 2.4.35 - Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects. | 4.0 | 1 |
| K/A Category Totals: | 0 | 0 | 0 | 0 | 2 | 2 | Group Point Total: 4 | | |

PWR SRO Examination Outline

Printed: 09/04/2018

Facility: IPEC

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

| Sys/Evol # / Name | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | KA Topic | Imp. | Points |
|--------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---|------|--------|
| 006 Emergency Core Cooling | | | | | | | | | | | X | 2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm. | 4.3 | 1 |
| 012 Reactor Protection | | | | | | | | X | | | | A2.01 - Faulty bistable operation | 3.6 | 1 |
| 039 Main and Reheat Steam | | | | | | | | X | | | | A2.03 - Indications and alarms for main steam and area radiation monitors (during SGTR) | 3.7 | 1 |
| 062 AC Electrical Distribution | | | | | | | | X | | | | A2.12 - Restoration of power to a system with a fault on it | 3.6 | 1 |
| 103 Containment | | | | | | | | | | | X | 2.2.44 - Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions. | 4.4 | 1 |
| K/A Category Totals: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 2 | Group Point Total: 5 | | |

PWR SRO Examination Outline

Printed: 09/04/2018

Facility: IPEC

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-2

| Sys/Evol # / Name | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | KA Topic | Imp. | Points |
|-----------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---|----------|--------|
| 034 Fuel Handling Equipment | | | | | | | | X | | | | A2.01 - Dropped fuel element | 4.4 | 1 |
| 068 Liquid Radwaste | | | | | | | | X | | | | A2.04 - Failure of automatic isolation | 3.3 | 1 |
| 071 Waste Gas Disposal | | | | | | | | | | | X | 2.2.38 - Knowledge of conditions and limitations in the facility license. | 4.5 | 1 |
| K/A Category Totals: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | Group Point Total: | 3 | |

Generic Knowledge and Abilities Outline (Tier 3)

PWR SRO Examination Outline

Printed: 09/04/2018

Facility: IPEC

Form ES-401-3

| <u>Generic Category</u> | <u>KA</u> | <u>KA Topic</u> | <u>Imp.</u> | <u>Points</u> |
|----------------------------------|------------------------|---|--------------------|----------------------|
| Conduct of Operations | 2.1.41 | Knowledge of the refueling process. | 3.7 | 1 |
| | Category Total: | | | 1 |
| Equipment Control | 2.2.13 | Knowledge of tagging and clearance procedures. | 4.3 | 1 |
| | 2.2.40 | Ability to apply Technical Specifications for a system. | 4.7 | 1 |
| | Category Total: | | | 2 |
| Radiation Control | 2.3.11 | Ability to control radiation releases. | 4.3 | 1 |
| | 2.3.12 | Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. | 3.7 | 1 |
| | Category Total: | | | 2 |
| Emergency Procedures/Plan | 2.4.8 | Knowledge of how abnormal operating procedures are used in conjunction with EOPs. | 4.5 | 1 |
| | 2.4.30 | Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. | 4.1 | 1 |
| | Category Total: | | | 2 |

Generic Total: 7

Facility: IPEC

Printed: 08/16/2018

Date Of Exam: 02/04/2019

| Tier | Group | RO K/A Category Points | | | | | | | | | | | | SRO-Only Points | | | | |
|---|-------------|------------------------|----|----|-----|----|----|----|----|-----|----|----|-------|-----------------|---|----|-------|---|
| | | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G* | Total | A2 | | G* | Total | |
| 1. Emergency & Abnormal Plant Evolutions | 1 | 3 | 3 | 3 | N/A | | | 3 | 3 | N/A | | 3 | 18 | 0 | | 0 | 0 | |
| | 2 | 1 | 1 | 2 | | | | 2 | 2 | | | 1 | 9 | 0 | | 0 | 0 | |
| | Tier Totals | 4 | 4 | 5 | | | | 5 | 5 | | | 4 | 27 | 0 | | 0 | 0 | |
| 2. Plant Systems | 1 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 28 | 0 | | 0 | 0 | |
| | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 10 | 0 | 0 | 0 | 0 | |
| | Tier Totals | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 2 | 38 | 0 | | 0 | 0 | |
| 3. Generic Knowledge And Abilities Categories | | | | | 1 | | 2 | | 3 | | 4 | | 10 | 1 | 2 | 3 | 4 | 0 |
| | | | | | 2 | | 2 | | 3 | | 3 | | | 0 | 0 | 0 | 0 | |

Note:

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2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ± 1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
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6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
- 7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

PWR RO Examination Outline

Printed: 08/16/2018

Facility: IPEC

ES - 401 Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1 Form ES-401-2

| E/APE # / Name / Safety Function | K1 | K2 | K3 | A1 | A2 | G | KA Topic | Imp. | Points |
|--|----|----|----|----|----|---|---|------|--------|
| 000007 Reactor Trip - Stabilization - Recovery / 1 | | | | | X | | EA2.01 - Decreasing power level, from available indications | 4.1 | 1 |
| 000008 Pressurizer Vapor Space Accident / 3 | X | | | | | | AK1.01 - Thermodynamics and flow characteristics of open or leaking valves | 3.2 | 1 |
| 000009 Small Break LOCA / 3 | | | | | | X | 2.1.7 - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. | 4.4 | 1 |
| 000011 Large Break LOCA / 3 | | | | X | | | EA1.15 - RCS temperature and pressure | 4.2 | 1 |
| 000022 Loss of Rx Coolant Makeup / 2 | | | | | X | | AA2.01 - Whether charging line leak exists | 3.2 | 1 |
| 000025 Loss of RHR System / 4 | X | | | | | | AK1.01 - Loss of RHRS during all modes of operation | 3.9 | 1 |
| 000027 Pressurizer Pressure Control System Malfunction / 3 | | X | | | | | AK2.03 - Controllers and positioners | 2.6 | 1 |
| 000029 ATWS / 1 | | | X | | | | EK3.06 - Verifying a main turbine trip; methods | 4.2 | 1 |
| 000038 Steam Gen. Tube Rupture / 3 | | | X | | | | EK3.08 - Criteria for securing RCP | 4.1 | 1 |
| 000040 Steam Line Rupture - Excessive Heat Transfer / 4 | | X | | | | | AK2.01 - Valves | 2.6* | 1 |
| 000054 Loss of Main Feedwater / 4 | | | | | | X | 2.4.18 - Knowledge of the specific bases for EOPs. | 3.3 | 1 |
| 000055 Station Blackout / 6 | | | | X | | | EA1.02 - Manual ED/G start | 4.3 | 1 |
| 000056 Loss of Off-site Power / 6 | | | X | | | | AK3.01 - Order and time to initiation of power for the load sequencer | 3.5 | 1 |
| 000057 Loss of Vital AC Inst. Bus / 6 | | | | | X | | AA2.06 - AC instrument bus alarms for the inverter and alternate power source | 3.2 | 1 |
| 000058 Loss of DC Power / 6 | | | | | | X | 2.4.20 - Knowledge of operational implications of EOP warnings, cautions, and notes. | 3.8 | 1 |
| W/E04 LOCA Outside Containment / 3 | X | | | | | | EK1.1 - Components, capacity, and function of emergency systems | 3.5 | 1 |
| W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4 | | | | X | | | EA1.3 - Desired operating results during abnormal and emergency situations | 3.8 | 1 |
| W/E11 Loss of Emergency Coolant Recirc. / 4 | | X | | | | | EK2.2 - Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility | 3.9 | 1 |

PWR RO Examination Outline

Printed: 08/16/2018

Facility: IPEC

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

| E/APE # / Name / Safety Function | K1 | K2 | K3 | A1 | A2 | G | KA Topic | Imp. | Points |
|----------------------------------|----|----|----|----|----|---|--------------------|------|--------|
| K/A Category Totals: | 3 | 3 | 3 | 3 | 3 | 3 | Group Point Total: | 18 | |

PWR RO Examination Outline

Printed: 08/16/2018

Facility: IPEC

Plant Systems - Tier 2 / Group 1

ES - 401

Form ES-401-2

| Sys/Evol # / Name | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | KA Topic | Imp. | Points |
|--|----|----|----|----|----|----|----|----|----|----|---|---|------|--------|
| 003 Reactor Coolant Pump | | | | | X | | | | | | | K5.05 - The dependency of RCS flow rates upon the number of operating RCPs | 2.8* | 1 |
| 004 Chemical and Volume Control | | | | | X | | | | | | | K5.09 - Thermal shock: high component stress due to rapid temperature change | 3.7 | 1 |
| 004 Chemical and Volume Control | | | X | | | | | | | | | K3.04 - RCPS | 3.7 | 1 |
| 005 Residual Heat Removal | | | | X | | | | | | | | K4.12 - Lineup for piggyback mode with CSS | 3.1 | 1 |
| 006 Emergency Core Cooling | | X | | | | | | | | | | K2.02 - Valve operators for accumulators | 2.5* | 1 |
| 007 Pressurizer Relief/Quench Tank | | | | X | | | | | | | | K4.01 - Quench tank cooling | 2.6 | 1 |
| 008 Component Cooling Water | | | | | | | X | | | | | A1.02 - CCW temperature | 2.9 | 1 |
| 010 Pressurizer Pressure Control | | X | | | | | | | | | | K2.02 - Controller for PZR spray valve | 2.5 | 1 |
| 012 Reactor Protection | | | X | | | | | | | | | K3.01 - CRDS | 3.9 | 1 |
| 013 Engineered Safety Features Actuation | | | | | | X | | | | | | K6.01 - Sensors and detectors | 2.7* | 1 |
| 022 Containment Cooling | X | | | | | | | | | | | K1.01 - SWS/cooling system | 3.5 | 1 |
| 022 Containment Cooling | | | | | | | X | | | | | A1.02 - Containment pressure | 3.6 | 1 |
| 026 Containment Spray | | | | | | | | | | X | | A4.05 - Containment spray reset switches | 3.5 | 1 |
| 039 Main and Reheat Steam | | | | | | | | | X | | | A3.02 - Isolation of the MRSS | 3.1 | 1 |
| 059 Main Feedwater | | | | | | | | | X | | | A3.02 - Programmed levels of the S/G | 2.9 | 1 |
| 059 Main Feedwater | | | | | | | | | | | X | 2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation. | 4.3 | 1 |
| 061 Auxiliary/Emergency Feedwater | | | | | | X | | | | | | K6.02 - Pumps | 2.6 | 1 |
| 061 Auxiliary/Emergency Feedwater | | | | | | X | | | | | | K6.01 - Controllers and positioners | 2.5 | 1 |
| 062 AC Electrical Distribution | | | | | | | | | | | X | 2.4.47 - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material. | 4.2 | 1 |
| 063 DC Electrical Distribution | | | | X | | | | | | | | K4.02 - Breaker interlocks, permissives, bypasses and cross-ties | 2.9* | 1 |

PWR RO Examination Outline

Printed: 08/16/2018

Facility: IPEC

ES - 401 Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2 Form ES-401-2

| E/APE # / Name / Safety Function | K1 | K2 | K3 | A1 | A2 | G | KA Topic | Imp. | Points |
|---|----------|----------|----------|----------|----------|----------|---|----------|--------|
| 000005 Inoperable/Stuck Control Rod / 1 | | | X | | | | AK3.05 - Power limits on rod misalignment | 3.4 | 1 |
| 000028 Pressurizer Level Malfunction / 2 | | | X | | | | AK3.03 - False indication of PZR level when PORV or spray valve is open and RCS saturated | 3.5 | 1 |
| 000032 Loss of Source Range NI / 7 | | | | | | X | 2.4.2 - Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. | 4.5 | 1 |
| 000060 Accidental Gaseous Radwaste Rel. / 9 | | | | X | | | AA1.01 - Area radiation monitors | 2.8 | 1 |
| 000068 Control Room Evac. / 8 | | | | | X | | AA2.05 - Availability of heat sink | 4.2 | 1 |
| 000076 High Reactor Coolant Activity / 9 | | X | | | | | AK2.01 - Process radiation monitors | 2.6 | 1 |
| W/E08 RCS Overcooling - PTS / 4 | X | | | | | | EK1.2 - Normal, abnormal and emergency operating procedures associated with Pressurized Thermal Shock | 3.4 | 1 |
| W/E10 Natural Circ. / 4 | | | | | X | | EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments | 3.4 | 1 |
| W/E15 Containment Flooding / 5 | | | | X | | | EA1.3 - Desired operating results during abnormal and emergency situations | 2.8 | 1 |
| K/A Category Totals: | 1 | 1 | 2 | 2 | 2 | 1 | Group Point Total: | 9 | |

PWR RO Examination Outline

Printed: 08/16/2018

Facility: IPEC

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

| Sys/Evol # / Name | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | KA Topic | Imp. | Points |
|----------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--|-----------|--------|
| 063 DC Electrical Distribution | X | | | | | | | | | | | K1.03 - Battery charger and battery | 2.9 | 1 |
| 064 Emergency Diesel Generator | X | | | | | | | | | | | K1.02 - ED/G cooling water system | 3.1 | 1 |
| 073 Process Radiation Monitoring | | | | | | | | | | X | | A4.01 - Effluent release | 3.9 | 1 |
| 073 Process Radiation Monitoring | | | | | | | | X | | | | A2.02 - Detector failure | 2.7 | 1 |
| 076 Service Water | | | | | | | X | | | | | A1.02 - Reactor and turbine building closed cooling water temperatures | 2.6* | 1 |
| 076 Service Water | | | X | | | | | | | | | K3.07 - ESF loads | 3.7 | 1 |
| 078 Instrument Air | | | | | | | | | | X | | A4.01 - Pressure gauges | 3.1 | 1 |
| 103 Containment | | | | | | | | X | | | | A2.03 - Phase A and B isolation | 3.5 | 1 |
| K/A Category Totals: | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | Group Point Total: | 28 | |

PWR RO Examination Outline

Printed: 08/16/2018

Facility: IPEC

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-2

| Sys/Evol # / Name | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | KA Topic | Imp. | Points |
|---------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---|-----------|--------|
| 001 Control Rod Drive | | | | X | | | | | | | | K4.07 - Rod stops | 3.7 | 1 |
| 011 Pressurizer Level Control | | | | | | X | | | | | | K6.03 - Relationship between PZR level and PZR heater control circuit | 2.9 | 1 |
| 017 In-core Temperature Monitor | | | | | | | X | | | | | A1.01 - Core exit temperature | 3.7 | 1 |
| 029 Containment Purge | | | | | | | | | | X | | A4.04 - Containment evacuation signal | 3.5 | 1 |
| 033 Spent Fuel Pool Cooling | X | | | | | | | | | | | K1.05 - RWST | 2.7* | 1 |
| 035 Steam Generator | | | | | X | | | | | | | K5.03 - Shrink and swell concept | 2.8 | 1 |
| 041 Steam Dump/Turbine Bypass Control | | X | | | | | | | | | | K2.02 - ICS inverter breakers | 2.8 | 1 |
| 045 Main Turbine Generator | | | X | | | | | | | | | K3.01 - Remainder of the plant | 2.9 | 1 |
| 055 Condenser Air Removal | | | | | | | | | X | | | A3.03 - Automatic diversion of CARS exhaust | 2.5* | 1 |
| 056 Condensate | | | | | | | | X | | | | A2.04 - Loss of condensate pumps | 2.6 | 1 |
| K/A Category Totals: | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | Group Point Total: | 10 | |

Generic Knowledge and Abilities Outline (Tier 3)

PWR RO Examination Outline

Printed: 08/16/2018

Facility: IPEC

Form ES-401-3

| <u>Generic Category</u> | <u>KA</u> | <u>KA Topic</u> | <u>Imp.</u> | <u>Points</u> |
|----------------------------------|------------------------|---|-------------|---------------|
| Conduct of Operations | 2.1.13 | Knowledge of facility requirements for controlling vital / controlled access. | 2.5 | 1 |
| | 2.1.27 | Knowledge of system purpose and/or function. | 3.9 | 1 |
| | Category Total: | | | 2 |
| Equipment Control | 2.2.35 | Ability to determine Technical Specification Mode of Operation. | 3.6 | 1 |
| | 2.2.41 | Ability to obtain and interpret station electrical and mechanical drawings. | 3.5 | 1 |
| | Category Total: | | | 2 |
| Radiation Control | 2.3.7 | Ability to comply with radiation work permit requirements during normal or abnormal conditions. | 3.5 | 1 |
| | 2.3.14 | Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. | 3.4 | 1 |
| | 2.3.15 | Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc. | 2.9 | 1 |
| | Category Total: | | | 3 |
| Emergency Procedures/Plan | 2.4.28 | Knowledge of procedures relating to a security event (non-safeguards information). | 3.2 | 1 |
| | 2.4.42 | Knowledge of emergency response facilities. | 2.6 | 1 |
| | 2.4.49 | Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. | 4.6 | 1 |
| | Category Total: | | | 3 |

Generic Total: 10

