ES-301 **Administrative Topics Outline** **Form ES-301-1**

Facility: Turkey Point Units 3 & 4 Date of Examination: 10/23/2017

Examination Level: RO ☒ SRO ☐ Operating Test Number: 2017-301

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D, R	Perform and Evaluate QPTR 2.1.7: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (RO 4.4)
Conduct of Operations	P, R	Calculate a Manual Makeup to the VCT 2.1.25: Ability to interpret reference materials, such as graphs, curves, tables, etc. (RO 3.9)
Equipment Control	M, R	Perform Accident Monitoring Instrument Channel Checks 2.2.12: Knowledge of surveillance procedures. (RO 3.7)
Radiation Control	D, R	Steam Generator Tube Leakage Estimation 2.3.14: Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. (RO 3.4)
Emergency Plan		NOT SELECTED FOR RO EXAM

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)

JPM SUMMARY STATEMENTS

A.1.a	Perform and Evaluate QPTR: Given excore detector currents, the operator is directed to perform 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio. Section 4.2, Determination of NIS QPTR Using Detector Current Readings, will require the operator to evaluate actual excore detector currents with Plant Curve Book Section 5 Figure 5, Excore NIS Calibration Factors and Setpoints, and record on Attachment 1, Determination of NIS QPTR Using Excore Detector Currents. Upon completion of Attachment 1, the operator will determine that the QPTR is outside of the Acceptance Criteria.
A.1.b	Calculate a Manual Makeup to the VCT: The operator is given current VCT level, desired VCT level, RCS and BAST concentrations, and boric acid flow rate. The operator is directed to calculate primary water flow rate, primary water volume, boric acid volume, and potentiometer settings for both primary water and boric acid controllers IAW 0-OP-046, CVCS – Boron Concentration Control, and Plant Curve Book Section 3, Boron Change Tables, Method 2.
A.2	Perform Accident Monitoring Instrument Channel Checks: Operator is directed to perform the monthly check of the Core Exit Thermocouples IAW 3-OSP-204, Accident Monitoring Instrumentation Channel Checks, Section 4.10, Core Exit Thermocouples Channel Check. After recording and evaluating the data for all quadrants, the operator will determine that some Functional and Acceptance Criteria are not met.
A.3	Steam Generator Tube Leakage Estimation: The operator is directed to perform 3-ONOP-071.2, Steam Generator Tube Leakage, to estimate tube leakage after receiving Annunciator H-1/4 PRMS HI RADIATION due to high radiation readings on R-15. The operator is given the Meteorological and Rad Data screen of DCS, which contains R-15 and SPING data, and air in leakage. This information is then used in conjunction with Plant Curve Book Section 5 Figures 14 and 15 for SJAE SPING to Secondary Leak Rate Graph and R-15 Primary to Secondary Leak Rate Graph respectively. Leakage is within Action Levels listed in Attachment 3, Guidelines for Continued Plant Operation with Primary to Secondary Leakage, of 3-ONOP-071.2.
A.4	NOT SELECTED FOR RO EXAM

ES-301 **Administrative Topics Outline** **Form ES-301-1**

Facility: Turkey Point Units 3 & 4 Date of Examination: 10/23/2017

Examination Level: RO ☐ SRO ☒ Operating Test Number: 2017-301

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D, R	Perform and Evaluate QPTR 2.1.7: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (SRO 4.7)
Conduct of Operations	D, R	Determine Contingency Actions per 0-ADM-051 2.1.20: Ability to interpret and execute procedure steps. (SRO 4.6)
Equipment Control	D, R	Determine Required Action For CCW Test 2.2.12: Knowledge of surveillance procedures. (SRO 4.1)
Radiation Control	P, R	Approve Liquid Release Permits 2.3.6: Ability to approve release permits. (SRO 3.8)
Emergency Plan	M, R	Issue PARs and Determine Evacuation Route 2.4.44: Knowledge of emergency plan protective action recommendations. (SRO 4.4)

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)

JPM SUMMARY STATEMENTS

A.1.a	Perform and Evaluate QPTR: Given excore detector currents, the SRO is directed to perform 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio. Section 4.2, Determination of NIS QPTR Using Detector Current Readings, had been completed yielding suspect results. The SRO is now directed to perform Section 4.3, Determination of NIS QPTR Using Detector Voltage Readings. This will require the SRO to evaluate detector voltages with Plant Curve Book Section 5 Figure 5, Excore NIS Calibration Factors and Setpoints, and record on Attachment 2, Determination of NIS QPTR Using Excore Detector Volts. Upon completion of Attachment 2, the SRO will determine that the QPTR is outside of the Acceptance Criteria and identify all applicable Technical Specifications.
A.1.b	Determine Contingency Actions per 0-ADM-051: SRO directed to perform a risk assessment for the loss of the 3A EDG during an outage IAW 0-ADM-051, Outage Risk Assessment and Control. SRO will determine the correct enclosure of 0-ADM-051 based on initial conditions. Plant Curve Book Section 5, Figure 9, Level Indicators vs RCS Component Elevations, and Plant Curve Book Section 5, Figure 12A, RCS Level Cross Reference, will be used for evaluating RCS inventory and distance below the Reactor Vessel Flange. Based on plant conditions, Safe Shutdown Function Color Code and required contingency actions will be recognized.
A.2	Determine Required Action For CCW Test: An inservice test for the 3A Component Cooling Water Pump has just been completed IAW 3-OSP-030.1, Component Cooling Water Pump Inservice Test. SRO is required to list any equipment deficiencies, determine pump operability, and identify and applicable Technical Specification actions. Upon reviewing the data the SRO will identify CCW pump vibrations are exceeding alert and required action ranges as well as CCW pump head outside of the required action range. Pump will be declared inoperable and Technical Specifications will be listed.
A.3	Approve Liquid Release Permits: Recycle Monitor Tank has been recirculated, sampled, analyzed, and a Radioactive Liquid Release Permit has been generated. Process Radiation Monitor R-18 is out of service. SRO is required to review 0-NOP-061.11A, Controlled Liquid Release from Recycle Monitor Tank A, and determine any procedural requirements that may be required prior to commencing the release. The SRO shall also review and the Radioactive Liquid Release Permit for completeness and accuracy IAW 0-NCOP-003, Preparation of Liquid Release Permits, and the Offsite Dose Calculation Manual. Upon review, the SRO will determine that several actions are to be taken due to R-18 being out of service and the Radioactive Liquid Release Permit being incomplete and invalid.
A.4	Issue PARs and Determine Evacuation Route: Unit 3 has declared a General Emergency. Emergency Classification is FG1. The SRO will be provided with a list of plant conditions during the emergency. The SRO is directed to evaluate conditions using 0-EPIP-20101, Duties of the Emergency Coordinator, and evaluate protective action recommendations using 0-EPIP-20134, Offsite Notifications and Protective Action Recommendations. Based on plant conditions, wind directions, and PARs evaluation, the SRO is directed to complete the Florida Nuclear Plant Emergency Notification Form and determine the appropriate Evacuation Route.

ES-301 **Control Room/In Plant Systems Outline** **Form ES-301-2**

Facility: Turkey Point Units 3 & 4 Date of Examination: 10/23/2017

Examination Level: RO ☒ SRO-I ☐ SRO-U ☐ Operating Test Number: 2017-301

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. 001 Control Rod Drive System (A2.11 4.4) Withdraw Control Rods and Restore to Automatic Control	A, N, S	1
b. 006 Emergency Core Cooling System (A4.02 4.0) Align Safety Injection For Hot Leg Recirc	A, M, L, S	2
c. W E02 Emergency Core Cooling System (EA1.1 4.0) Terminate SI	P, L, S	3
d. APE 015 Reactor Coolant Pump Malfunctions (AA1.23 3.1) Start 3A RCP in Mode 3	A, D, L, S	4P
e. 061 Auxiliary Feedwater System (A2.05 3.1) Shutdown of AFW Pumps from Spurious Actuation	EN, N, S	4S
f. APE 069 Loss of Containment Integrity (AA2.02 3.9) Automatic Phase B Actuation Failure	EN, L, N, S	5
g. 064 Emergency Diesel Generator System (A4.06 3.9) Perform 3A Emergency Diesel Generator Operability Test	A, D, L, S	6
h. 073 Process Radiation Monitoring System (A4.02 3.7) R-11/12 PRMS Operational Test	N, S	7
In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. 001 Control Rod Drive System (A4.08 3.7) Startup A Rod Drive Motor Generator Set	D	1
j. EPE 011 Large Break LOCA (EA1.13 4.1) Realignment of Unit 4 High Head SI Pump Suction to Unit 4 RWST	E, L, N, R	4P
k. APE 054 Loss of Main Feedwater (AA1.01 4.5) Manually Control Steam to AFW Pump with T&T Valve	A, D	4S

* 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 RO /SRO-I/SRO-U
(A)lternate path	4–6/4–6/2–3
(C)ontrol room	
(D)irect from bank	≤ 9/≤ 8/≤ 4
(E)mergency or abnormal in-plant	≥ 1/≥ 1/≥ 1
(EN)gineered safety feature	≥ 1/≥ 1/≥ 1 (control room system)
(L)ow-Power/Shutdown	≥ 1/≥ 1/≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2/≥ 2/≥ 1
(P)revious 2 exams	≤ 3/≤ 3/≤ 2 (randomly selected)
(R)CA	≥ 1/≥ 1/≥ 1
(S)imulator	

JPM SUMMARY STATEMENTS

a.	Withdraw Control Rods and Restore to Automatic Control: Control Rods have stepped in as a result of a plant transient. The operator has been directed to restore control rods to ARO and place them in automatic control. Upon placing the rod control switch back in automatic control, rods will continuously insert requiring execution of 3-ONOP-028, Reactor Control System Malfunction, and 3-EOP-E-0, Reactor Trip or Safety Injection, immediate operator actions.
b.	Align Safety Injection For Hot Leg Recirc: The plant has been aligned for Cold Leg Recirculation IAW 3-EOP-ES-1.3, Transfer to Cold Leg Recirculation. The operator is required to place the plant on Hot Leg Recirculation IAW 3-EOP-ES-1.4, Transfer to Hot Leg Recirculation. MOV-3-843B, SI to Cold Leg Isolation Valve, fails to close. The operator will reestablish Cold Leg Recirculation. Upon the realignment, MOV-3-866A, Loop Hot Leg Safety Injection Valve, trips on motor overload. The response is to isolate flow via MOV-3-869, Safety Injection to Hot Leg Isolation, and start HHSI pumps to minimize core flow interruption to less than three minutes. A portion of this JPM is time critical.
c.	Terminate SI: Unit 3 has experienced a spurious Train B Safety Injection. The crew entered 3-EOP-E-0, Reactor Trip or Safety Injection. The Balance of Plant Operator has just started performing 3-EOP-E-0, Attachment 3, Prompt Action Verifications. The crew has transitioned to 3-EOP-ES-1.1, SI Termination. The operator is directed to terminate SI IAW 3-EOP-ES-1.1. The operator is required to reset SI and Phase A in order to establish charging flow and terminate RHR and HHSI pumps.
d.	Start 3A RCP in Mode 3: Unit 3 is in Mode 3 with shutdown banks withdrawn. 3A RCP was stopped for maintenance and is ready to be restarted IAW 3-NOP-041.01A, 3A Reactor Coolant Pump Operations. Upon starting, the 3A RCP has high vibrations. High vibrations are confirmed and 3-ONOP-041.1, Reactor Coolant Pump Off-Normal, is entered. Reactor trip criteria is met per the foldout page. Actions are taken IAW 3-ONOP-041.1 foldout page after verifying Reactor Trip using EOP network.
e.	Shutdown of AFW Pumps from Spurious Actuation: There has been a spurious initiation of Train A Auxiliary Feedwater. The operator is required to shut down the AFW system IAW 3-NOP-075, Auxiliary Feedwater System. After reducing AFW flow, the operator will close the required steam supply MOVs and adjust respective train hand controllers to normal setpoints and place in automatic control.
f.	Automatic Phase B Actuation Failure: Unit 3 has experienced a faulted generator inside containment. As a result, containment pressure has increased to greater than 20 psig. The operator is directed to perform 3-EOP-E-0, Reactor Trip or Safety Injection, Attachment 3, Prompt Action Verification. Upon performance of Attachment 3 the operator will recognize that Phase B automatic actuation has failed. Containment spray is running but all Phase B valves will need to be manually closed and all RCPs manually stopped.
g.	Perform 3A Emergency Diesel Generator Operability Test: Unit 3 is in Mode 3. 3A EDG is running unloaded IAW 3-OSP-023.1, Diesel Generator Operability Test. The operator is required to take over the test and continue to synchronize the 3A EDG to the 3A 4kV bus. As the operator raises load, the 3A EDG kW continues to increase uncontrollably. The operator will either trip the 3A EDG or open the EDG output breaker.
h.	R-11/12 PRMS Operational Test: R-3-11 initial test conditions have been completed per 3-OSP-067.1A, R-3-11/12 Process Radiation Monitoring Operational Test. The operator is directed to perform Section 4.2.2, Testing R-3-11 Alert/Warning Functions, to test R-3-11 alert/warning functions and then restore setpoints to pre-test conditions.
i.	Startup A Rod Drive Motor Generator Set: No Control Rod Drive MG Sets are currently operating. Both Control Rod Drive MG Set breakers are racked in. The operator is directed to start the 3A Control Rod Drive MG Set IAW 3-NOP-028, Control Rod Drive MG Set Operation.
j.	Realignment of Unit 4 High Head SI Pump Suction to Unit 4 RWST: Unit 3 has experienced a Loss of Emergency Coolant Recirculation. Unit 3 is preparing to establish Safety Injection from Unit 4 RWST. The operator has been directed to perform 3-EOP-ECA-1.1, Loss of Emergency Coolant Recirculation, Attachment 3, Realignment of Unit 4 High Head SI Pump Suction to Unit 4 RWST.
k.	Manually Control Steam to AFW Pump with T&T Valve: Unit 3 has tripped from 100% power. The A Auxiliary Feedwater Pump has tripped on overspeed. The operator is directed to restore the A AFW pump IAW 3-ONOP-075, Auxiliary Feedwater System Malfunction. The operator will reset the Trip and Throttle valve, manually use the T&T to control steam, and subsequently secure the pump after steam leakage is identified.

ES-301 **Control Room/In Plant Systems Outline** **Form ES-301-2**

Facility: Turkey Point Units 3 & 4 Date of Examination: 10/23/2017

Examination Level: RO ☐ SRO-I ☒ SRO-U ☐ Operating Test Number: 2017-301

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. 001 Control Rod Drive System (A2.11 4.7) Withdraw Control Rods and Restore to Automatic Control	A, N, S	1
b. 006 Emergency Core Cooling System (A4.02 3.8) Align Safety Injection For Hot Leg Recirc	A, M, L, S	2
c. W E02 Emergency Core Cooling System (EA1.1 3.9) Terminate SI	P, L, S	3
d. APE 015 Reactor Coolant Pump Malfunctions (AA1.23 3.2) Start 3A RCP in Mode 3	A, D, L, S	4P
e. 061 Auxiliary Feedwater System (A2.05 3.4) Shutdown of AFW Pumps from Spurious Actuation	EN, N, S	4S
f. APE 069 Loss of Containment Integrity (AA2.02 4.4) Automatic Phase B Actuation Failure	EN, L, N, S	5
g. 064 Emergency Diesel Generator System (A4.06 3.9) Perform 3A Emergency Diesel Generator Operability Test	A, D, L, S	6
h. NOT SELECTED FOR SRO EXAM	N/A	N/A
In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. 001 Control Rod Drive System (A4.08 3.4) Startup A Rod Drive Motor Generator Set	D	1
j. EPE 011 Large Break LOCA (EA1.13 4.2) Realignment of Unit 4 High Head SI Pump Suction to Unit 4 RWST	E, L, N, R	4P
k. APE 054 Loss of Main Feedwater (AA1.01 4.4) Manually Control Steam to AFW Pump with T&T Valve	A, D	4S

* 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 RO /SRO-I/SRO-U
(A)lternate path	4–6/4–6/2–3
(C)ontrol room	
(D)irect from bank	≤ 9/≤ 8/≤ 4
(E)mergency or abnormal in-plant	≥ 1/≥ 1/≥ 1
(EN)gineered safety feature	≥ 1/≥ 1/≥ 1 (control room system)
(L)ow-Power/Shutdown	≥ 1/≥ 1/≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2/≥ 2/≥ 1
(P)revious 2 exams	≤ 3/≤ 3/≤ 2 (randomly selected)
(R)CA	≥ 1/≥ 1/≥ 1
(S)imulator	

JPM SUMMARY STATEMENTS

a.	Withdraw Control Rods and Restore to Automatic Control: Control Rods have stepped in as a result of a plant transient. The operator has been directed to restore control rods to ARO and place them in automatic control. Upon placing the rod control switch back in automatic control, rods will continuously insert requiring execution of 3-ONOP-028, Reactor Control System Malfunction, and 3-EOP-E-0, Reactor Trip or Safety Injection, immediate operator actions.
b.	Align Safety Injection For Hot Leg Recirc: The plant has been aligned for Cold Leg Recirculation IAW 3-EOP-ES-1.3, Transfer to Cold Leg Recirculation. The operator is required to place the plant on Hot Leg Recirculation IAW 3-EOP-ES-1.4, Transfer to Hot Leg Recirculation. MOV-3-843B, SI to Cold Leg Isolation Valve, fails to close. The operator will reestablish Cold Leg Recirculation. Upon the realignment, MOV-3-866A, Loop Hot Leg Safety Injection Valve, trips on motor overload. The response is to isolate flow via MOV-3-869, Safety Injection to Hot Leg Isolation, and start HHSI pumps to minimize core flow interruption to less than three minutes. A portion of this JPM is time critical.
c.	Terminate SI: Unit 3 has experienced a spurious Train B Safety Injection. The crew entered 3-EOP-E-0, Reactor Trip or Safety Injection. The Balance of Plant Operator has just started performing 3-EOP-E-0, Attachment 3, Prompt Action Verifications. The crew has transitioned to 3-EOP-ES-1.1, SI Termination. The operator is directed to terminate SI IAW 3-EOP-ES-1.1. The operator is required to reset SI and Phase A in order to establish charging flow and terminate RHR and HHSI pumps.
d.	Start 3A RCP in Mode 3: Unit 3 is in Mode 3 with shutdown banks withdrawn. 3A RCP was stopped for maintenance and is ready to be restarted IAW 3-NOP-041.01A, 3A Reactor Coolant Pump Operations. Upon starting, the 3A RCP has high vibrations. High vibrations are confirmed and 3-ONOP-041.1, Reactor Coolant Pump Off-Normal, is entered. Reactor trip criteria is met per the foldout page. Actions are taken IAW 3-ONOP-041.1 foldout page after verifying Reactor Trip using EOP network.
e.	Shutdown of AFW Pumps from Spurious Actuation: There has been a spurious initiation of Train A Auxiliary Feedwater. The operator is required to shut down the AFW system IAW 3-NOP-075, Auxiliary Feedwater System. After reducing AFW flow, the operator will close the required steam supply MOVs and adjust respective train hand controllers to normal setpoints and place in automatic control.
f.	Automatic Phase B Actuation Failure: Unit 3 has experienced a faulted generator inside containment. As a result, containment pressure has increased to greater than 20 psig. The operator is directed to perform 3-EOP-E-0, Reactor Trip or Safety Injection, Attachment 3, Prompt Action Verification. Upon performance of Attachment 3 the operator will recognize that Phase B automatic actuation has failed. Containment spray is running but all Phase B valves will need to be manually closed and all RCPs manually stopped.
g.	Perform 3A Emergency Diesel Generator Operability Test: Unit 3 is in Mode 3. 3A EDG is running unloaded IAW 3-OSP-023.1, Diesel Generator Operability Test. The operator is required to take over the test and continue to synchronize the 3A EDG to the 3A 4kV bus. As the operator raises load, the 3A EDG kW continues to increase uncontrollably. The operator will either trip the 3A EDG or open the EDG output breaker.
h.	NOT SELECTED FOR SRO EXAM
i.	Startup A Rod Drive Motor Generator Set: No Control Rod Drive MG Sets are currently operating. Both Control Rod Drive MG Set breakers are racked in. The operator is directed to start the 3A Control Rod Drive MG Set IAW 3-NOP-028, Control Rod Drive MG Set Operation.
j.	Realignment of Unit 4 High Head SI Pump Suction to Unit 4 RWST: Unit 3 has experienced a Loss of Emergency Coolant Recirculation. Unit 3 is preparing to establish Safety Injection from Unit 4 RWST. The operator has been directed to perform 3-EOP-ECA-1.1, Loss of Emergency Coolant Recirculation, Attachment 3, Realignment of Unit 4 High Head SI Pump Suction to Unit 4 RWST.
k.	Manually Control Steam to AFW Pump with T&T Valve: Unit 3 has tripped from 100% power. The A Auxiliary Feedwater Pump has tripped on overspeed. The operator is directed to restore the A AFW pump IAW 3-ONOP-075, Auxiliary Feedwater System Malfunction. The operator will reset the Trip and Throttle valve, manually use the T&T to control steam, and subsequently secure the pump after steam leakage is identified.

ES-301 **Operating Test Review Worksheet** **Form ES-301-7**

Facility:	**Turkey Point**											**Exam Date:**	**10/23/2017**
Admin JPMs	1 ADMIN Topic and K/A	2 LOD (1-5)	3 Attributes							4 Job Content		5 U/E/S	6 Explanation
			I/C Focus	Cues	Critical Steps	Scope (N/B)	Overlap	Perf. Std.	Key	Minutia	Job Link		
													Generic: – Revise all Admin JPM initiating cues to include procedure name. Plant curve book and TS to be provided as references (in binders) for all.
RO A1a	COO / 2.1.7	3										S	D, R – Can be administered concurrent with SRO A1a – Revise JPM key to provide answers to 4 significant digits – Corrected in Final Submittal.
RO A1b	COO / 2.1.25	3										S	P, R – No changes
RO A2	EC / 2.2.12	3										S	M, R – Outline comment resolved – No changes
RO A3	RC / 2.3.14	3										S	D, R – Outline comment resolved – No changes
SRO A1a	COO / 2.1.7	3										S	D, R – Outline comment resolved – Can be administered concurrent with RO A1a – Cannot be procedurally performed as written – Revise JPM to perform determination of Section 4.3 adequacy (i.e. Attachment 2). Will require modification to provide I&C data and notification that Section 4.2 determined to be inadequate (i.e. results are suspect). Applicant to determine appropriate TS evaluation following Att 2 completion. – Corrected in Final Submittal.
SRO A1b	COO / 2.1.20	3										S	D, R – Facility to investigate having fleet procedure available for use as reference if desired.

SRO A2	EC / 2.2.12	3										S	D, R – JPM Initiating Cue is cluttered. Revise Initiating Cue to state "You are directed to perform Step 7.1.32 of 3-OSP-030.1 **and determine the following:**" The second bullet can be removed. – Is it intended for applicant to mark "3A CCW" under Equipment Deficiencies if the applicant makes the determination of equipment Operability and TS entry? Identification of Equipment Deficiencies is specifically spelled out for applicant identification, yet is not addressed in the JPM guide. – Revise JPM standard to indicate performance of JPM Step 2 **or** 3 as CRITICAL. – Revise JPM standard to indicate performance of JPM Step 5 as CRITICAL. – Revise initiating cue 2: Justify your operability determination utilizing the evaluated parameters of 3-OSP-030.1. – Corrected in Final Submittal.
SRO A3	RC / 2.3.6	3										S	P, R – Revise expected count rate to read 2.854E3. – Corrected in Final Submittal.
SRO A4	EP / 2.4.44	3										S	M, R – Outline comment resolved – Merge initial conditions with given turnover info on Page 1. "Inform evaluator when Page 2 is ready to be transmitted to the EC." – Page 2 converted to be a given partially completed ENF form (without PAR block completed) - Page 3 converted to be initiating cue and determination of site evacuation route. – Ensure Time Critical aspect is incorporated. – Corrected in Final Submittal.

Simulator/ In-Plant JPMs	1 Safety Function and K/A											
JPM A	1 / 001A2.11	3									S	A, N, S – Outline comment resolved – RMCS in Manual is not required as an Initial Condition (available to applicant in Sim) – No changes
JPM B	2 / 006A4.02	3									S	A, M, L, S – Outline comment resolved – Incorporate basis for 3 minute Time Critical aspect be included in the JPM guide for this JPM (or just provide reference doc)? – Per **ES-301**, "the same system or evolution should not be used to evaluate more than one safety function in each location" – This JPM meets all other requirements with the exception of K/A assignment overlap with JPM C. – Separate Bullet 1 into 2 bullets. – Renumber sequences to include 10, 11 – Sequences 6, 7, 8 no longer CRITICAL – Time Critical portion of this JPM is 3.77 minutes (3 min 46 sec) – Corrected in Final Submittal.
JPM C	3 / 006A4.01	3									S	P, L, S – Outline comment resolved – Per **ES-301**, "the same system or evolution should not be used to evaluate more than one safety function in each location" – This JPM meets all other requirements with the exception of K/A assignment overlap with JPM B. – Include 5-13 gpm band for Sequence 7 – Add U4 at 100% RTP to Initial Conditions. – Corrected in Final Submittal.
JPM D	4P / 015AA1.23	3									S	A, D, L, S – Outline comment resolved – Remove third IC bullet. Specifically verbiage concerning "TS 3.4.1.2, LCO Action b". Not an evaluation point for this JPM or required information to perform the task. – JPM Step 11, why would examiner provide this procedure section? Is this available in the Simulator? – JPM Step 13, remove evaluator cue as an Examiner would not direct an applicant action during administration of a JPM. – No changes

JPM E	4S / 061A2.05	3										S	EN, N, S – JPM Step 8/13 (place HIC controllers in AUTO) is CRITICAL, yet JPM Step 3/9 (reduce AFW flow) is not. Is this correct for as-given task? I.e. should Step 3/9 be CRITICAL? Or does placing controller in AUTO not rely on initial flow setting for these controllers? – JPM Sequence 8 is now final step of JPM (another operator will continue from here) – Incorporate band of 135-140 gpm for acceptable flow setting – Corrected in Final Submittal.
JPM F	5 / 069AA2.02	3										S	EN, L, N, S – During administration, ensure simulator reset permits Containment Pressure parameters to exhibit full traverse of casualty (i.e. pressure spike with subsequent lowering) – add Booth Cue for this – Include procedure steps for Sequence 3 (valves) – NO longer CRITICAL – Corrected in Final Submittal.
JPM G	6 / 064A4.06	3										S	A, D, L, S – Remove 3rd Initial Condition bullet. (none required for task) – Remove 2nd, 5th, 6th, 7th, and 8th Initiating Cue bullets. (none required for task) – Place test performance bullet into initial conditions – Simplify initiating cue “applicant directed to perform Step 7.1.31. –Highlight CRITICAL steps in yellow – For Sequence 1, only “a” is CRITICAL – Include an examiner cue that another operator will perform Attachment 2. – Corrected in Final Submittal.
JPM H	7 / 073A4.02	3										S	N, S – Outline comment resolved – JPM Step 8, Is there a value the applicant is trained to input here that the examiner should be cognizant of? – Add in completed copy of Section 4.2.1 to permit applicant referring to this during administration – Add in Rad Monitor placard data. – Corrected in Final Submittal.

JPM I	1 / 001A4.08	3										S	D – JPM Step 6, Is “holding” of the Field Flash Pushbutton during performance of this step significant to examiner cueing? What if applicant just depresses the PB, would the voltage indication just move up to the expected 260 VAC? Concerned about examiner cueing in the field here. Please strengthen the language used in the Evaluator Cue box to specify what the applicant is expected to do when performing this step. – Revise examiner cue to require applicant adjustment of voltage control switch – Corrected in Final Submittal.
JPM J	4P / 011EA1.13	3										S	E, L, N, R – Outline comment resolved
JPM K	4S / 054AA1.01	3										S	A, D – Cueing present in Initiating Cue. “You have been directed by … to attempt to …” Restate this initiating cue to merely direct the applicant to perform the requested task. – JPM Step 12, Remove the word “properly” from the evaluator cue. Examiners do not provide affirmation of applicant actions, only plant response indications. - JPM Step 13, Please highlight (or in some way make more distinguishable) that the examiner is required to notify the applicant of the “very large amount of steam” (i.e. alternate path initiation). Doesn’t need to be a separate step, just emphasized in some way.

Instructions for Completing This Table:

Check or mark any item(s) requiring a comment and explain the issue in the space provided using the guide below.

1. Check each JPM for appropriate administrative topic requirements (COO, EC, Rad, and EP) or safety function requirements and corresponding K/A. Mark in column 1. (ES-301, D.3 and D.4)

2. Determine the level of difficulty (LOD) using an established 1–5 rating scale. Levels 1 and 5 represent an inappropriate (low or high) discriminatory level for the license that is being tested. Mark in column 2 (Appendix D, C.1.f)

3. In column 3, "Attributes," check the appropriate box when an attribute is **not met**:
   - ☐ The initial conditions and/or initiating cue is clear to ensure the operator understands the task and how to begin. (Appendix C, B.4)
   - ☐ The JPM contains appropriate cues that clearly indicate when they should be provided to the examinee. Cues are objective and not leading. (Appendix C, D.1)
   - ☐ All critical steps (elements) are properly identified.
   - ☐ The scope of the task is not too narrow (N) or too broad (B).
   - ☐ Excessive overlap does not occur with other parts of the operating test or written examination. (ES-301, D.1.a, and ES-301, D.2.a)
   - ☐ The task performance standard clearly describes the expected outcome (i.e., end state). Each performance step identifies a standard for successful completion of the step.
   - ☐ A valid marked up key was provided (e.g., graph interpretation, initialed steps for handouts).

4. For column 4, "Job Content," check the appropriate box if the job content flaw **does not meet** the following elements:
   - ☐ Topics are linked to the job content (e.g., not a disguised task, task required in real job).
   - ☐ The JPM has meaningful performance requirements that will provide a legitimate basis for evaluating the applicant's understanding and ability to safely operate the plant. (ES-301, D.2.c)

5. Based on the reviewer's judgment, is the JPM as written (U)nacceptable (requiring repair or replacement), in need of (E)nhancement, or (S)atisfactory? Mark the answer in column 5.

6. In column 6, provide a brief description of any (U)nacceptable or (E)nhancement rating from column 5.

Save initial review comments and detail subsequent comment resolution so that each exam-bound JPM is marked by a (S)atisfactory resolution on this form.

Facility: Turkey Point						Scenario:		N1 (Spare) Exam Date: 10/23/2017	
1 Event	2 Realism/Cred.	3 Required Actions	4 Verifiable actions	5 LOD	6 TS	7 CTs	8 Scen. Overlap	9 U/E/S	10 Explanation
1								S	– Outline comment resolved
2					✔			S	– Pg 15, Top right BOP Step 4 is not required. Un-highlight or restate to "May place…" – Pg 15, TS, include bistable names Changes incorporated in final submittal 10/10/2017
3					✔		✔	S	– Overlap 2015-301 – Pg 16, 3-ONOP-028, if applicants request SM direction to restore Tavg=Tref using rods, direct applicants to perform their recommended action.
4								S	– Outline comment resolved (event revised) – Pg 19, cueing of rising SGFP bearing temperature requires modification • Dispatch operator then 2 min wait for reports • Field report of 205F (increasing), 212F (stabilizing), 215F (stabilized) @ 2 minute intervals • Engineering report (if called) – Corrected in Final Submittal.
5								S	
6								S	
7						✔		S	– Pg 26, Red or Orange path (response difference?) – Corrected in Final Submittal.
8						✔	✔	S	– Overlap 2016-301 – RHR CT removed. – Remove Pg's 28-32, no additional actions performed this scenario. – Corrected in Final Submittal.
8					2	2	6	S	

Facility: Turkey Point						Scenario:		N2	Exam Date: 10/23/2017
1 Event	2 Realism/Cred.	3 Required Actions	4 Verifiable actions	5 LOD	6 TS	7 CTs	8 Scen. Overlap	9 U/E/S	10 Explanation
1								S	– Outline comment resolved (event revised)
2					✔	✔		S	– Outline comment resolved – Swap event 2 with event 1 to ensure viability of Event 2 TS and Page 16, top right requires bullet – Corrected in Final Submittal.
3							✔	S	– Overlap 2015-301 and outline comment resolved (event re-ordered/revised/JPM overlap) – Page 18, title should be ONOP-071.2 vs 041.5 and revisit trigger for Event 3 (incorrect during validation) – Corrected in Final Submittal.
4					✔		✔	S	– Overlap 2015-301 and outline comment resolved (event re-ordered) – Page 24, Insert note for Event 5 entry, “ensure examiners have observed the required reactivity change prior to proceeding with scenario” – Corrected in Final Submittal.
5								S	– Outline comment resolved (event revised)
6						✔		S	– Page 32, Top right box requires modification and Page 34, Revise affected S/G to read 3C vs 3A, ECA-3.1 transition is earliest point to terminate scenario, add in Step 3.e & RNO to perform 3C S/G isolation – Corrected in Final Submittal.
7								S	– Revise write-up for Event 7 (D-1 write-up) to remove mention of MOV-3-1405 – Corrected in Final Submittal.
8								S	– Outline comment resolved and RHR CT removed and ensure trigger incorporated that fails MSIVs open – Corrected in Final Submittal.
8					2	2	6	S	

Facility: Turkey Point						Scenario: N3			Exam Date: 10/23/2017
1 Event	2 Realism/Cred.	3 Required Actions	4 Verifiable actions	5 LOD	6 TS	7 CTs	8 Scen. Overlap	9 U/E/S	10 Explanation
1					✔		✔	S	– Outline comment resolved (event revised) and overlap 2016-301
2					✔		✔	S	– Outline comment resolved (JPM overlap) and overlap 2016-301 – Page 13, Top right BOP Step 4 is not required. Un-highlight or restate to "May place…" – Corrected in Final Submittal.
3							✔	S	– Overlap 2016-301 and Page 17/18, No highlighting required for 3A TPCW pump STOP or I5/4 ann verification – Corrected in Final Submittal.
4								S	– Page 19, CCW R-17 samples are isolated and Sim Booth cue required for Supplemental Cooling OOS – Corrected in Final Submittal.
5							✔	S	– Overlap 2016-301 and Page 23, CRDM breaker location cue requires modification – Corrected in Final Submittal.
6						✔ (x2)		S	– CT2 success criteria was to be revised to 280F Orange Path integrity. Current Scenario 3 guide states AFW flow isolation prior 1 hour soak. Why is this different? – Insert note for expected crew use of 2000 psig as Rx trip criteria – Page 30, Cue required for MSIV closure and Page 31, Transition to E-3 is earliest opportunity to terminate scenario – Corrected in Final Submittal.
7								S	– Ensure Event 7 is embedded as appropriate in Event 6
8							✔	S	– Outline comment resolved and overlap 2016-301 – CT3 removed and ensure Event 8 is incorporated as appropriate in Event 6 – Corrected in Final Submittal.
8					2	2	3	S	

Facility: Turkey Point						Scenario: N4			Exam Date: 10/23/2017
1 Event	2 Realism/Cred.	3 Required Actions	4 Verifiable actions	5 LOD	6 TS	7 CTs	8 Scen. Overlap	9 U/E/S	10 Explanation
1					✔	✔	✔	S	– Overlap 2015-301
2								S	– TS 3.4.6.2 condition D required during Vessel Flange Leak – TS leakage spec for > 10 gpm required following leak isolation – Corrected in Final Submittal.
3					✔			S	– Outline comment resolved (event revised) – Page 14, Top right BOP Step 4 is not required. Un-highlight or restate to “May place…” – Corrected in Final Submittal.
4								S	
5								S	
6								S	– Note that termination criteria can be met following transition from FR-S.1 back to E-0 (2nd time) – Corrected in Final Submittal.
7								S	
8						✔		S	
8					2	2	7	S	

Facility: Turkey Point						Scenario: N5			Exam Date: 10/23/2017
1 Event	2 Realism/Cred.	3 Required Actions	4 Verifiable actions	5 LOD	6 TS	7 CTs	8 Scen. Overlap	9 U/E/S	10 Explanation
1								S	
					✔			S	– Incorporate TS associated with HHSI 3B oil leak after Event 1 – Corrected in Final Submittal.
2								S	– Include CCW tank level indication 614A for use by applicant during this event. – Page 13, revise field report to include that leak is isolated and specify that “832 is a throttle valve” as a note to examiner – Corrected in Final Submittal.
3					✔			S	– Revise CT1 success criteria to the Rx Trip setpoint of 1835 psig. – Revise event 3 to provide ‘green’ light indication for breakers 30402 and 35001. – Corrected in Final Submittal.
4						✔		S	– Outline comment resolved (event revised) – Page 17, listed TS is not applicable (mode of applicability), revise guide – Corrected in Final Submittal.
5								S	
6								S	– Page 19, insert breaker # manipulated for power swaps – Page 20, revise foldout criteria #5 to be listed as ‘YES’, once 3rd RCP is tripped – provide auto trigger for Event 8 (include RCP foldout page actions) – Corrected in Final Submittal.
7								S	
8						✔		S	– Page 23, revise E-1 note to state that operators may return to E-0, insert note that states that 3A EDG may have been started for Event 7 (pg 20) – Corrected in Final Submittal.
8					2	2	8	S	

Facility: **Turkey Point**						**Scenario:**	**N7**		**Exam Date:** **10/23/2017**
1 Event	2 Realism/Cred.	3 Required Actions	4 Verifiable actions	5 LOD	6 TS	7 CTs	8 Scen. Overlap	9 U/E/S	10 Explanation
1								S	– Outline comment resolved (event re-ordered) and reconfigure Event 1 to force a shutdown of the 3A2 CWP, then incorporate failure of MOV-3-1415 – Corrected in Final Submittal.
2								S	– Outline comment resolved (event re-ordered) – Swap Event 2 with Event 5 (fuel failure), operational validity and Page 17, insert note that operators can place additional orifi in service as required. – Corrected in Final Submittal.
3					✔			S	– Outline comment resolved (event re-ordered) – Page 20, revise cue and TS, add TS 3.1.3.1.c & 3.1.3.5 to TS call – Corrected in Final Submittal.
4								S	– Outline comment resolved – CT for failure to isolate PORV leakage to be constrained by 283F (containment DB) and Page 21, revise sim report to 4 hours and insert note for fast load reduction that operators may lower power in manual – Corrected in Final Submittal.
5					✔		✔	S	– Overlap 2015-301 and outline comment resolved (event revised) – Top right BOP Step is not required. Un-highlight or restate to “May place…” and swap Event 5 with Event 2 (3B S/G FRV controller), operational validity – Corrected in Final Submittal.
6						✔ (x2)		S	– Page 30, Procedure transition to either E-0 or E-2 is earliest termination opportunity – Corrected in Final Submittal.
7							✔	S	– Overlap 2015-301
8								S	– CT3 removed.
8					2	2	6	S	

Instructions for Completing This Table:

Use this table for each scenario for evaluation.

2 Check this box if the events are not related (e.g., seismic event followed by a pipe rupture) **OR** if the events do not obey the laws of physics and thermodynamics.

3, 4 In columns 3 and 4, check the box if there is **no** verifiable or required action, as applicable. Examples of required actions are as follows: (ES-301, D.5f)

- opening, closing, and throttling valves
- starting and stopping equipment
- raising and lowering level, flow, and pressure
- making decisions and giving directions
- acknowledging or verifying key alarms and automatic actions (Uncomplicated events that require no operator action beyond this should **not** be included on the operating test unless they are necessary to set the stage for subsequent events. (Appendix D, B.3).)

5 Check this box if the level of difficulty is **not** appropriate.

6 Check this box if the event has a TS.

7 Check this box if the event has a critical task (CT). If the same CT covers more than one event, check the event where the CT started **only.**

8 Check this box if the event overlaps with another event on any of the last two NRC examinations. (Appendix D, C.1.f)

9 Based on the reviewer's judgment, is the event as written (U)nacceptable (requiring repair or replacement), in need of (E)nhancement, or (S)atisfactory? Mark the answer in column 9.

10 Record any explanations of the events here.

In the shaded boxes, sum the number of check marks in each column.

- In column 1, sum the number of events.
- In columns 2–4, record the total number of check marks for each column.
- In column 5, based on the reviewer's judgement, place a checkmark only if the scenario's LOD is not appropriate.
- In column 6, TS are required to be ≥ 2 for each scenario. (ES-301, D.5.d)
- In column 7, preidentified CTs should be ≥ 2 for each scenario. (Appendix D; ES-301, D.5.d; ES-301-4)
- In column 8, record the number of events not used on the two previous NRC initial licensing exams. A scenario is considered unsatisfactory if there is < 2 new events. (ES-301, D.5.b; Appendix D, C.1.f)
- In column 9, record whether the scenario as written (U)nacceptable, in need of (E)nhancement, or (S)atisfactory from column 11 of the simulator scenario table.

Facility: Turkey Point **Exam Date: 10/23/2017**

Scenario	1 Event Totals	2 Events Unsat.	3 TS Total	4 TS Unsat.	5 CT Total	6 CT Unsat.	7 % Unsat. Scenario Elements	8 U/E/S	11 Explanation
N1 (Spare)	8	0	2	0	2	0	0	S	
N2	8	0	2	0	2	0	0	S	
N3	8	0	2	0	2	0	0	S	
N4	8	0	2	1	2	0	8.33	S	
N5	8	0	2	1	2	0	8.33	S	
N7	8	0	2	1	2	0	8.33	S	

Instructions for Completing This Table:

Check or mark any item(s) requiring comment and explain the issue in the space provided.

1, 3, 5 For each simulator scenario, enter the **total** number of events (column 1), TS entries/actions (column 3), and CTs (column 5). This number should match the respective scenario from the event-based scenario tables (the sum from columns 1, 6, and 7, respectively).

2, 4, 6 For each simulator scenario, evaluate each event, TS, and CT as (S)atisfactory, (E)nhance, or (U)nsatisfactory based on the following criteria:

a. Events. Each event is described on a Form ES-D-2, including all switch manipulations, pertinent alarms, and verifiable actions. Event actions are balanced between at-the-controls and balance-of-plant applicants during the scenario. All event-related attributes on Form ES-301-4 are met. Enter the total number of unsatisfactory events in column 2.

b. TS. A scenario includes at least two TS entries/actions across at least two different events. TS entries and actions are detailed on Form ES-D-2. Enter the total number of unsatisfactory TS entries/actions in column 4. (ES-301, D.5d)

c. CT. Check that a scenario includes at least two preidentified CTs. This criterion is a target quantitative attribute, not an absolute minimum requirement. Check that each CT is explicitly bounded on Form ES-D-2 with measurable performance standards (see Appendix D). Enter the total number of unsatisfactory CTs in column 6.

7 In column 7, calculate the percentage of unsatisfactory scenario elements: $\left(\frac{2+4+6}{1+3+5}\right)100\%$

8 If the value in column 7 is > 20%, mark the scenario as (U)nsatisfactory in column 8. If column 7 is ≤ 20%, annotate with (E)nhancement or (S)atisfactory.

9 In column 9, explain each unsatisfactory event, TS, and CT. Editorial comments can also be added here.

Save initial review comments and detail subsequent comment resolution so that each exam-bound scenario is marked by a (S)atisfactory resolution on this form.

ES-301	Operating Test Review Worksheet	Form ES-301-7

Site name: Turkey Point **Exam Date:** 10/23/2017

OPERATING TEST TOTALS

	Total	Total Unsat.	Total Edits	Total Sat.	% Unsat.	Explanation
Admin. JPMs	9	1	4	4		
Sim./In-Plant JPMs	11	0	7	4		
Scenarios	6	0	6	0		
Op. Test Totals:	26	1	17	8	**3.85**	

Instructions for Completing This Table:

Update data for this table from quality reviews and totals in the previous tables and then calculate the percentage of total items that are unsatisfactory and give an explanation in the space provided.

1. Enter the total number of items submitted for the operating test in the "Total" column. For example, if nine administrative JPMs were submitted, enter "9" in the "Total" items column for administrative JPMs. For scenarios, enter the total number of simulator scenarios.

2. Enter the total number of (U)nsatisfactory JPMs and scenarios from the two JPMs column 5 and simulator scenarios column 8 in the previous tables. Provide an explanation in the space provided.

3. Enter totals for (E)nhancements needed and (S)atisfactory JPMs and scenarios from the previous tables. This task is for tracking only.

4. Total each column and enter the amounts in the "Op. Test Totals" row.

5. Calculate the percentage of the operating test that is (U)nsatisfactory (Op. Test Total Unsat.)/(Op. Test Total) and place this value in the bolded "% Unsat." cell.

   Refer to ES-501, E.3.a, to rate the overall operating test as follows:
   - satisfactory, if the "Op. Test Total" "% Unsat." is ≤ 20%
   - unsatisfactory, if "Op. Test Total" "% Unsat." is > 20%

6. Update this table and the tables above with post-exam changes if the "as-administered" operating test required content changes, including the following:
   - The JPM performance standards were incorrect.
   - The administrative JPM tasks/keys were incorrect.
   - CTs were incorrect in the scenarios (not including postscenario critical tasks defined in Appendix D).
   - The EOP strategy was incorrect in a scenario(s).
   - TS entries/actions were determined to be incorrect in a scenario(s).

Facility: Date of Exam:

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 and Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A		3	18	3	3	6
	2	1	1	2				2	2			1	9	2	2	4
	Tier Totals	4	4	5				5	5			4	27	5	5	10
2. Plant Systems	1	3	2	2	3	3	3	2	3	2	3	2	28	3	2	5
	2	1	1	1	1	1	0	1	1	1	1	1	10	0 / 2	1	3
	Tier Totals	4	3	3	4	4	3	3	4	3	4	3	38	5	3	8
3. Generic Knowledge and Abilities Categories		1			2			3			4		10	1 / 2	3 / 4	7
		3			3			1			3			2 / 2	1 / 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 outline sections (i.e., except for one category in Tier 3 of the SRO-only section, the "Tier Totals" in each K/A category shall not be less than two). (One Tier 3 radiation control K/A is allowed if it is replaced by a K/A from another Tier 3 category.)

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 outline. Systems or evolutions that do not apply at the facility should be deleted with justification. 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' 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 a category 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.

G* Generic K/As

* These systems/evolutions must be included as part of the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan. They are not required to be included when using earlier revisions of the K/A catalog.

** These systems/evolutions may be eliminated from the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan.

ES-401 PWR Examination Outline Form ES-401-2

Emergency and Abnormal Plant Evolutions—Tier 1/Group 1 (RO/SRO)

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#
000007 (EPE 7; BW E02&E10; CE E02) Reactor Trip, Stabilization, Recovery / 1	X						007EK1.02, Knowledge of the operational implications of the following concepts as they apply to the reactor trip: Shutdown margin	3.4	
000008 (APE 8) Pressurizer Vapor Space Accident / 3						X	008AG2.1.20, Ability to interpret and execute procedure steps as they apply to Pressurizer Vapor Space Accident.	4.6	
000009 (EPE 9) Small Break LOCA / 3				X			009EA1.04, Ability to operate and monitor the following as they apply to a small break LOCA: CVCS	3.7	
000011 (EPE 11) Large Break LOCA / 3			X				011EK3.14, Knowledge of the reasons for the following responses as the apply to the Large Break LOCA: RCP tripping requirement	4.1	
000015 (APE 15) Reactor Coolant Pump Malfunctions / 4					X		015AA2.11, Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): When to jog RCPs during ICC	3.4	
000022 (APE 22) Loss of Reactor Coolant Makeup / 2									
000025 (APE 25) Loss of Residual Heat Removal System / 4						X	025AG2.2.36, Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations as they apply to Loss of Residual Heat Removal System.	3.1	
000026 (APE 26) Loss of Component Cooling Water / 8						X	026AG2.2.42, Ability to recognize system parameters that are entry-level conditions for Technical Specifications as they apply to Loss of Component Cooling Water.	3.9	
000027 (APE 27) Pressurizer Pressure Control System Malfunction / 3		X					027AK2.03, Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: Controllers and positioners	2.6	
000029 (EPE 29) Anticipated Transient Without Scram / 1					X		029EA2.06, Ability to determine or interpret the following as they apply to a ATWS: Main turbine trip switch position indication	3.8	
000038 (EPE 38) Steam Generator Tube Rupture / 3	X						038EK1.02, Knowledge of the operational implications of the following concepts as they apply to the SGTR: Leak rate vs. pressure drop	3.2	
000040 (APE 40; BW E05; CE E05; W E12) Steam Line Rupture—Excessive Heat Transfer / 4									

000054 (APE 54; CE E06) Loss of Main Feedwater /4						X	054AG2.4.2, Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions as they apply to Loss of Main Feedwater.	4.6	
000055 (EPE 55) Station Blackout / 6			X				055EK3.02, Knowledge of the reasons for the following responses as the apply to the Station Blackout: Actions contained in EOP for loss of offsite and onsite power	4.3	
					X		055EA2.06, Ability to determine or interpret the following as they apply to a Station Blackout: Faults and lockouts that must be cleared prior to re- energizing buses	4.1	
000056 (APE 56) Loss of Offsite Power / 6									
000057 (APE 57) Loss of Vital AC Instrument Bus / 6					X		057AA2.02, Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: Core flood tank pressure and level indicators	3.7	
000058 (APE 58) Loss of DC Power / 6				X			058AA1.02, Ability to operate and / or monitor the following as they apply to the Loss of DC Power: Static inverter dc input breaker, frequency meter, ac output breaker, and ground fault detector	3.1	
						X	058AG2.4.3, Ability to identify post-accident instrumentation as they apply to Loss of DC Power	3.9	
000062 (APE 62) Loss of Nuclear Service Water / 4			X				062AK3.02, Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water: The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS	3.6	
000065 (APE 65) Loss of Instrument Air / 8				X			065AA1.02, Ability to operate and / or monitor the following as they apply to the Loss of Instrument Air: Components served by instrument air to minimize drain on system	2.6	
000077 (APE 77) Generator Voltage and Electric Grid Disturbances / 6		X					077AK2.06, Knowledge of the interrelations between Generator Voltage and Electric Grid Disturbances and the following: Reactor power	3.9	
					X		077AA2.02, Ability to determine and interpret the following as they apply to Generator Voltage and Electric Grid Disturbances: Voltage outside the generator capability curve	3.6	

(W E04) LOCA Outside Containment / 3						X	WE04EG2.4.6, Knowledge of EOP mitigation strategies as they apply to LOCA Outside Containment	4.7	
(W E11) Loss of Emergency Coolant Recirculation / 4	X						WE11EK1.1, Knowledge of the operational implications of the following concepts as they apply to the (Loss of Emergency Coolant Recirculation): Components, capacity, and function of emergency systems	3.7	
(BW E04; W E05) Inadequate Heat Transfer—Loss of Secondary Heat Sink / 4		X					WE05EK2.2, Knowledge of the interrelations between the (Loss of Secondary Heat Sink) and the following: 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	
					X		WE05EA2.1, Ability to determine and interpret the following as they apply to the (Loss of Secondary Heat Sink): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	4.4	
K/A Category Totals:	3	3	3	3	3/3	3/3	Group Point Total:		18/6

ES-401	PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions—Tier 1/Group 2 (RO/SRO)									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#
000001 (APE 1) Continuous Rod Withdrawal / 1					X		001AA2.05, Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal: Uncontrolled rod withdrawal, from available indications	4.4	
000003 (APE 3) Dropped Control Rod / 1									
000005 (APE 5) Inoperable/Stuck Control Rod / 1									
000024 (APE 24) Emergency Boration / 1									
000028 (APE 28) Pressurizer (PZR) Level Control Malfunction / 2					X		028AA2.03, Ability to determine and interpret the following as they apply to the Pressurizer Level Control Malfunctions: Charging subsystem flow indicator and controller	2.8	
000032 (APE 32) Loss of Source Range Nuclear Instrumentation / 7									
000033 (APE 33) Loss of Intermediate Range Nuclear Instrumentation / 7									
000036 (APE 36; BW/A08) Fuel-Handling Incidents / 8					X		036AA2.02, Ability to determine and interpret the following as they apply to the Fuel Handling Incidents: Occurrence of a fuel handling incident	4.1	
000037 (APE 37) Steam Generator Tube Leak / 3				X			037AA1.04, Ability to operate and / or monitor the following as they apply to the Steam Generator Tube Leak: Condensate air ejector exhaust radiation monitor and failure indicator	3.6	
000051 (APE 51) Loss of Condenser Vacuum / 4			X				051AK3.01, Knowledge of the reasons for the following responses as they apply to the Loss of Condenser Vacuum: Loss of steam dump capability upon loss of condenser vacuum	2.8	
000059 (APE 59) Accidental Liquid Radwaste Release / 9									
000060 (APE 60) Accidental Gaseous Radwaste Release / 9			X				060AK3.03, Knowledge of the reasons for the following responses as they apply to the Accidental Gaseous Radwaste: Actions contained in EOP for accidental gaseous-waste release	3.8	
						X	060AG2.4.35, Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects as they apply to the Accidental Gaseous Radwaste Release	4.0	

000061 (APE 61) Area Radiation Monitoring System Alarms / 7					X		061AA2.03, Ability to determine and interpret the following as they apply to the Area Radiation Monitoring (ARM) System Alarms: Setpoints for alert and high alarms	3.3	
000067 (APE 67) Plant Fire On Site / 8									
000068 (APE 68; BW A06) Control Room Evacuation / 8						X	068AG2.2.12, Knowledge of surveillance procedures as they apply to Control Room Evacuation	3.7	
000069 (APE 69; W E14) Loss of Containment Integrity / 5						X	WE14EG2.4.4, Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures as they apply to Loss of Containment Integrity	4.7	
000074 (EPE 74; W E06 & E07) Inadequate Core Cooling / 4									
000076 (APE 76) High Reactor Coolant Activity / 9				X			076AA1.04, Ability to operate and / or monitor the following as they apply to the High Reactor Coolant Activity: Failed fuel-monitoring equipment	3.2	
000078 (APE 78*) RCS Leak / 3									
(W E01 & E02) Rediagnosis & SI Termination / 3									
(W E13) Steam Generator Overpressure / 4									
(W E15) Containment Flooding / 5		X					WE15EK2.1, Knowledge of the interrelations between the (Containment Flooding) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	2.8	
(W E16) High Containment Radiation /9									
(BW E08; W E03) LOCA Cooldown—Depressurization / 4									
(BW E09; CE A13**; W E09 & E10) Natural Circulation/4									
(CE A11**; W E08) RCS Overcooling—Pressurized Thermal Shock / 4	X						WE08EK1.1, Knowledge of the operational implications of the following concepts as they apply to the (Pressurized Thermal Shock): Components, capacity, and function of emergency systems.	3.8	
K/A Category Point Totals:	1	1	2	2	2/2	1/2	Group Point Total:		9/4

ES-401	PWR Examination Outline Plant Systems—Tier 2/Group 1 (RO/SRO)											Form ES-401-2	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#
003 (SF4P RCP) Reactor Coolant Pump						X						003K6.04, Knowledge of the effect of a loss or malfunction on the following will have on the RCPS: Containment isolation valves affecting RCP operation	2.8	
004 (SF1; SF2 CVCS) Chemical and Volume Control								X				004A2.16, Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: T-ave. and T-ref. deviations	3.2	
											X	004G2.4.46, Ability to verify that the alarms are consistent with the plant conditions as they apply to the CVCS	4.2	
005 (SF4P RHR) Residual Heat Removal					X							005K5.09, Knowledge of the operational implications of the following concepts as they apply the RHRS: Dilution and boration considerations	3.2	
006 (SF2; SF3 ECCS) Emergency Core Cooling				X								006K4.09, Knowledge of ECCS design feature(s) and/or interlock(s) which provide for the following: Valve positioning on safety injection signal	3.9	
								X				006A2.01, Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: High bearing temperature	3.1	
007 (SF5 PRTS) Pressurizer Relief/Quench Tank					X							007K5.02, Knowledge of the operational implications of the following concepts as the apply to PRTS: Method of forming a steam bubble in the PZR	3.1	
008 (SF8 CCW) Component Cooling Water			X									008K3.03, Knowledge of the effect that a loss or malfunction of the CCWS will have on the following: RCP	4.1	

010 (SF3 PZR PCS) Pressurizer Pressure Control				X	X						010K4.03, Knowledge of PZR PCS design feature(s) and/or interlock(s) which provide for the following: Over pressure control 010K5.02, Knowledge of the operational implications of the following concepts as the apply to the PZR PCS: Constant enthalpy expansion through a valve	3.8 2.6	
012 (SF7 RPS) Reactor Protection						X		X			012K6.02, Knowledge of the effect of a loss or malfunction of the following will have on the RPS: Redundant channels 012A2.05, Ability to (a) predict the impacts of the following malfunctions or operations on the RPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Faulty or erratic operation of detectors and function generators	2.9 3.2	
013 (SF2 ESFAS) Engineered Safety Features Actuation		X									013K2.01, Knowledge of bus power supplies to the following: ESFAS/safeguards equipment control	3.6	
022 (SF5 CCS) Containment Cooling	X		X								022K1.04, Knowledge of the physical connections and/or cause effect relationships between the CCS and the following systems: Chilled water 022K3.02, Knowledge of the effect that a loss or malfunction of the CCS will have on the following: Containment instrumentation readings	2.9 3.0	
025 (SF5 ICE) Ice Condenser													
026 (SF5 CSS) Containment Spray									X		026A4.01, Ability to manually operate and/or monitor in the control room: CSS controls	4.5	

039 (SF4S MSS) Main and Reheat Steam								X			039A3.02, Ability to monitor automatic operation of the MRSS, including: Isolation of the MRSS	3.1	
							X				039A2.03, Ability to (a) predict the impacts of the following malfunctions or operations on the MRSS; and (b) based on predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Indications and alarms for main steam and area radiation monitors (during SGTR)	3.7	
059 (SF4S MFW) Main Feedwater							X				059A1.03, Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MFW controls including: Power level restrictions for operation of MFW pumps and valves	2.7	
				X							059K4.18, Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following: Automatic feedwater reduction on plant trip	3.0	
061 (SF4S AFW) Auxiliary/Emergency Feedwater		X									061K2.01, Knowledge of bus power supplies to the following: AFW system MOVs	3.2	
						X					061K6.02, Knowledge of the effect of a loss or malfunction of the following will have on the AFW components: Pumps	2.6	
062 (SF6 ED AC) AC Electrical Distribution							X				062A1.03, Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ac distribution system controls including: Effect on instrumentation and controls of switching power supplies	2.5	
063 (SF6 ED DC) DC Electrical Distribution										X	063G2.1.7, Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation as they apply to the DC electrical system	4.4	
	X										063K1.02, Knowledge of the physical connections and/or cause effect relationships between the DC electrical system and the following systems: AC electrical system	2.7	

064 (SF6 EDG) Emergency Diesel Generator	X										064K1.01, Knowledge of the physical connections and/or cause effect relationships between the ED/G system and the following systems: AC distribution system	4.1	
073 (SF7 PRM) Process Radiation Monitoring								X			073A2.02, Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Detector failure	2.7	
076 (SF4S SW) Service Water									X		076A3.02, Ability to monitor automatic operation of the SWS, including: Emergency heat loads	3.7	
										X	076A4.02, Ability to manually operate and/or monitor in the control room: SWS valves	2.6	
											X	076G2.1.23, Ability to perform specific system and integrated plant procedures during all modes of plant operation as the apply to the SWS	4.4	
078 (SF8 IAS) Instrument Air										X		078A4.01, Ability to manually operate and/or monitor in the control room: Pressure gauges	3.1	
103 (SF5 CNT) Containment								X				103A2.03, Ability to (a) predict the impacts of the following malfunctions or operations on the containment system and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations Phase A and B isolation	3.5	
											X	103G2.4.8, Knowledge of how abnormal operating procedures are used in conjunction with EOPs as they apply to the Containment System	4.5	
053 (SF1; SF4P ICS*) Integrated Control														
K/A Category Point Totals:	3	2	2	3	3	3	2	3/3	2	3	2/2	Group Point Total:		28/5

ES-401	PWR Examination Outline Plant Systems—Tier 2/Group 2 (RO/SRO)										Form ES-401-2		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#
001 (SF1 CRDS) Control Rod Drive		X										001K2.05, Knowledge of bus power supplies to the following: M/G sets	3.1	
002 (SF2; SF4P RCS) Reactor Coolant														
011 (SF2 PZR LCS) Pressurizer Level Control			X									011K3.01, Knowledge of the effect that a loss or malfunction of the PZR LCS will have on the following: CVCS	3.2	
014 (SF1 RPI) Rod Position Indication											X	014G2.2.25, Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits as they apply to the RPIS	4.2	
015 (SF7 NI) Nuclear Instrumentation	X											015K1.01, Knowledge of the physical connections and/or cause effect relationships between the NIS and the following systems: RPS	4.1	
016 (SF7 NNI) Nonnuclear Instrumentation														
017 (SF7 ITM) In-Core Temperature Monitor														
027 (SF5 CIRS) Containment Iodine Removal														
028 (SF5 HRPS) Hydrogen Recombiner and Purge Control														
029 (SF8 CPS) Containment Purge							X	 X				029A1.03, Ability to predict and/or monitor changes in parameters to prevent exceeding design limits) associated with operating the Containment Purge System controls including: Containment pressure, temperature, and humidity 029A2.04, Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Health physics sampling of containment atmosphere	3.0 3.2	
033 (SF8 SFPCS) Spent Fuel Pool Cooling								X				033A2.02, Ability to (a) predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of SFPCS	3.0	

034 (SF8 FHS) Fuel-Handling Equipment													
035 (SF 4P SG) Steam Generator													
041 (SF4S SDS) Steam Dump/Turbine Bypass Control					X						041K5.06, Knowledge of the operational implications of the following concepts as the apply to the SDS: Effect of power change on fuel cladding	2.5	
045 (SF 4S MTG) Main Turbine Generator				X							045K4.01, Knowledge of MT/G system design feature(s) and/or interlock(s) which provide for the following: Programmed controller for relationship between steam pressure at T/G inlet (impulse, first stage) and plant power level	2.7	
055 (SF4S CARS) Condenser Air Removal										X	055G2.1.19, Ability to use plant computers to evaluate system or component status.	3.9	
056 (SF4S CDS) Condensate							X				056A2.04, Ability to (a) predict the impacts of the following malfunctions or operations on the Condensate System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of condensate pumps	2.6	
068 (SF9 LRS) Liquid Radwaste													
071 (SF9 WGS) Waste Gas Disposal													
072 (SF7 ARM) Area Radiation Monitoring									X		072A4.01, Ability to manually operate and/or monitor in the control room: Alarm and interlock setpoint checks and adjustments	3.0	
075 (SF8 CW) Circulating Water													
079 (SF8 SAS**) Station Air													
086 Fire Protection								X			086A3.01, Ability to monitor automatic operation of the Fire Protection System including: Starting mechanisms of fire water pumps	2.9	
050 (SF 9 CRV*) Control Room Ventilation													
K/A Category Point Totals:	1	1	1	1	1	0	1	1/2	1	1	1/1	Group Point Total:	10/3

Facility:		Date of Exam:				
Category	K/A #	Topic	RO		SRO-only	
			IR	#	IR	#
1. Conduct of Operations	G2.1.15	Knowledge of administrative requirements for temporary management directives, such as standing orders, night orders, Operations memos, etc.	2.7			
	G2.1.31	Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.	4.6			
	G2.1.42	Knowledge of new and spent fuel movement procedures.	2.5			
	G2.1.1	Knowledge of conduct of operations requirements.			4.2	
	G2.1.36	Knowledge of procedures and limitations involved in core alterations.			4.1	
	Subtotal					
2. Equipment Control	G2.2.12	Knowledge of surveillance procedures.	3.7			
	G2.2.14	Knowledge of the process for controlling equipment configuration or status.	3.9			
	G2.2.38	Knowledge of conditions and limitations in the facility license.	3.6			
	G2.2.37	Ability to determine operability and/or availability of safety related equipment.			4.6	
	G2.2.7	Knowledge of the process for conducting special or infrequent tests.			3.6	
	Subtotal					
3. Radiation Control	G2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.4			
	G2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.			3.1	
	Subtotal					
4. Emergency Procedures/Plan	G2.4.12	Knowledge of general operating crew responsibilities during emergency operations.	4.0			
	G2.4.20	Knowledge of the operational implications of EOP warnings, cautions, and notes.	3.8			
	G2.4.5	Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.	3.7			
	2.4.25	Knowledge of fire protection procedures.			3.7	
	2.4.40	Knowledge of SRO responsibilities in emergency plan implementation.			4.5	
	Subtotal					
Tier 3 Point Total				10		7

ES-401 **Record of Rejected K/As** **Form ES-401-4**

No rejected K/As.

Tier/Group	Randomly Selected K/A	Reason for Rejection

ES-401 Written Examination Quality Checklist Form ES-401-6

Facility: Turkey Point Units 3 & 4 Date of Exam: 10/23/2017 Exam Level: RO ☒ SRO ☒

	Item Description	Initial a	Initial b*	Initial c*#
1.	Questions and answers are technically accurate and applicable to the facility.	M	m	✓
2.	a. NRC K/As are referenced for all questions. b. Facility learning objectives are referenced as available. c. Correct answer explanation and distractor analysis provided (ES-401, D.2.g)	M	m	✓
3.	SRO questions are appropriate in accordance with Section D.2.d of ES-401	M	m	✓
4	The sampling process was random and systematic. (If more than four RO or two SRO questions were repeated from the last two NRC licensing exams, consult the NRR/NRO OL program office).	M	m	✓
5.	Question duplication from the licensee screening/audit exam was controlled as indicated below (check the item that applies) and appears appropriate. ✓ The audit exam was systematically and randomly developed, or __ the audit exam was completed before the license exam was started, or __ the examinations were developed independently, or __ the licensee certifies that there is no duplication, or __ other (explain).	M	m	✓
6.	Bank use meets limits (no more than 75% from the bank, at least 10% new, and the rest new or modified); enter the actual RO/SRO-only question distribution(s) at right.	M	m	✓
	Bank: 12% 9/75 / 16% 4/25; Modified: 17.3% 13/75 / 16% 4/25; New: 70.7% 53/75 / 68% 17/25	M	m	✓
7.	Between 38 and 45 questions of the questions on the RO exam and at least 13 questions of the questions on the SRO-only portion of the exam are written at the comprehension/analysis level (see ES-401, D.2.c); enter the actual RO/SRO-only question distribution(s) at right.	M	m	✓
	Memory: 46.7% 35/75 / 24% 6/25; C/A: 53.3% 40/75 / 76% 19/25	M	m	✓
8.	References/handouts provided do not give away answers or aid in the elimination of distractors.	M	m	✓
9.	Question content conforms to specific K/A statements in the previously approved examination outline and is appropriate for the tier to which they are assigned; deviations are justified.	M	m	✓
10.	Question psychometric quality and format meet the guidelines in Appendix B.	M	m	✓
11.	The exam contains the required number of one-point, multiple-choice items; the total is correct and agrees with the value on the cover sheet.	M	m	✓

	Printed Name/Signature	Date
a. Author	Mark Wilson	10/05/17
b. Facility Reviewer (*)	Michael Murphy	10/03/17
c. NRC Chief Examiner (#)	Joseph P. Viera /	10/12/2017
d. NRC Regional Supervisor	Gerald J. McCoy /	10/19/2017

Note: * The facility reviewer's initials or signature are not applicable for NRC-developed examinations.
Independent NRC reviewer initials items in Column "c"; chief examiner concurrence is required.

ES-401 **Written Examination Review Worksheet** **Form ES-401-9**

Refer to Section D of ES-401 and Appendix B for additional information regarding each of the following concepts:

1. Enter the level of knowledge (LOK) of each question as either (F)undamental or (H)igher cognitive level.
2. Enter the level of difficulty (LOD) of each question a 1 (easy) to 5 (difficult); questions with a difficulty between 2 and 4 are acceptable.
3. Check the appropriate box if a psychometric flaw is identified:
   - "Stem Focus": The stem lacks sufficient focus to elicit the correct answer (e.g., unclear intent, more information is needed, or too much needless information).
   - "Cues": The stem or distractors contain cues (e.g., clues, specific determiners, phrasing, length).
   - "T/F": The answer choices are a collection of unrelated true/false statements.
   - "Cred. Dist.": The distractors are not credible; single implausible distractors should be repaired, and more than one is unacceptable.
   - "Partial": One or more distractors are partially correct (e.g., if the applicant can make unstated assumptions that are not contradicted by the stem).
4. Check the appropriate box if a job content flaw is identified:
   - "Job Link": The question is not linked to the job requirements (i.e., the question has a valid K/A but, as written, is not operational in content).
   - "Minutia": The question requires the recall of knowledge that is too specific for the closed-reference test mode (i.e., it is not required to be known from memory).
   - "#/Units": The question contains data with an unrealistic level of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons).
   - "Backward": The question requires reverse logic or application compared to the job requirements.
5. Check questions that are sampled for conformance with the approved K/A and those K/As that are designated "SRO-only." (K/A and license-level mismatches are unacceptable.)
6. Enter question's source: (B)ank, (M)odified, or (N)ew. Verify that (M)odified questions meet the criteria of Form ES-401, Section D.2.f.
7. Based on the reviewer's judgment, is the question, as written, (U)nsatisfactory (requiring repair or replacement), in need of (E)ditorial enhancement, or (S)atisfactory?
8. At a minimum, explain any "U" status ratings (e.g., how the Appendix B psychometric attributes are not being met).

Revision History

Revision 0 – 8/2/2017: Pre-Review test item NRC review

Revision 1 – 8/18/2017: Draft Submittal NRC review (Questions 1-30 transmitted 8/21) (Questions 31-100 transmitted 8/25)

Revision 2 – 9/7/2017: Draft Submittal Facility review

Revision 3 – 9/18/2017: 2nd Draft Submittal Facility review

Revision 4 – 10/11/2017: Final Submittal NRC review

Post-Exam Comment Q34 resulting in question deletion modifies RO % UNSAT to be 19% UNSAT.

Post-Exam Comment Q89 resulting in answer key change modifies SRO % UNSAT to be 28% UNSAT.

Q#	1. LOK (F/H) (H%) (50-60% H% RO)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N (Prev used)	7. U/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
	35/40 (53%)	1				13						2	1	7/14/54 (0 RO)	13/62	RO – #10, 14, 15, 16, 17, 18, 25, 35, 40, 53, 56, 61, 65 (17% Unsat)
	4/21 (84%)	2				3							2	5 (2)/3/17 (2 SRO)	6/19	SRO – #79, 82, 83, 90, 92, 98 (24% Unsat)

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
	Rev 0 Generic Comments: - Addition of full procedures to ensure compliance with submittal of ES-401-5 information is not required. There is very good highlighting and explanations provided in the attached procedures of the pre-review package, only those marked pages should be included for individual questions. - It is clear that a significant amount of effort went into ensuring sufficient KA matches for these pre-reviewed questions. However, in some cases this became all too evident in the form of cues incorporated into the questions (whether by inclusion of stem information or using references). Inappropriate cueing can, in many cases, invalidate the plausibility for distractors. Feedback is provided below to indicate ways this can be avoided, but in some cases, significant modification or wholesale swap out of question statements or answer choices may be required. - There are some instances of multiple correct answers being present. This is typically due to vague or non-specific wording used in question statements that can be considered to have more than one correct answer. It is unfavorable to present applicants with questions/answer choices that result in the decision making of "which one of these is the **most correct** answer". For NRC exams, there should be only one correct answer, with all other choices incorrect. Rev 1 Generic Comment: - Ensure examination references are verified. There appear to be some references included in the package which do not require inclusion (spider curves).															
1	F	3												N	S	Rev 1 comment - 2nd half question appears to only require knowledge of whether SI actuation has occurred to answer (i.e. no knowledge of SDM required to answer this half question). This half question also strays closely to SRO LOK. 2nd half question is a tack-on question. (Stem Focus) (?) Can revise question statements to (1) 1st half question above/ below or 537F/ other plausible temperature, with 2nd half question remaining 20 gpm/ 45 gpm Rev 2 comment - 1st half question remains the same, 2nd half question 537/547 - when boration is required Rev 4 comment - Question is SAT.
2	H	3												N	S	Rev 1 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
3	F	3												B (2010 Diablo Canyon)	S	Rev 1 comment - Aren't SI/RHR pump starts related to RCS pressure (given at 450#)? Remove one of these two initial conditions (no need for both). (Stem Focus) Rev 2 comment - Removed 3rd bullet, revised 1st two bullets (LOCA, SI cold leg injection flowrate provided) Rev 4 comment - Question is SAT.
4	H	3												M (2009 McGuire)	S	Rev 1 comment - How is answer choice 'c' not an additional correct answer based on an unstated assumption? (Partially correct) - Answer choices 'a' and 'b' appear to be cued for this question due to their presence in both in the initial conditions and current conditions for this question. (Cueing) Rev 2 comment - C is incorrect due to use of the word NEXT. Adjust last bullet to read, "RCP support conditions are not currently met". Stem conditions changed to remove cueing concern (3rd bullet under given conditions). Rev 4 comment - Question is SAT.
5	H	3												N	S	Rev 1 comment - Remove "Assuming no operator action". This is addressed in NUREG-1021, Appendix E. Applicants should assume normal plant response unless specific conditions are stated in the question. (Stem Focus) Rev 2 comment - Removed assume no operator action. 2nd half question tests 3.5.2 spec from perspective of other unit. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
6	F	3												N	S	Rev 1 comment - Remove the word "failure" from each question statement as this implies a given equipment condition as opposed to the applicant making the determination. (Cueing) Rev 2 comment - Removed the word failure. Rev 4 comment - Question is SAT.
7	H	3												M (2010 Turkey Point)	S	Rev 1 comment - Remove "Assuming no operator action". This is addressed in NUREG-1021, Appendix E. Applicants should assume normal plant response unless specific conditions are stated in the question. (Stem Focus) (?) Can use the concept of 'time' to clearly define when the applicant should be making the determination for answering of a given question (e.g. "Given the following conditions at 1000…" followed by "The PC-3-444J, xxx, will immediately indicate a demand of ___." Rev 2 comment - Removed assume no operator action. 1st half question revised to "shifts to __" and 2nd half question revised to "INITIALLY rises/lowers". Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
8	F	3												N	S	Rev 1 comment - What is the purpose of including the 4th 'Subsequently' bullet. SG NR level doesn't appear to require evaluation to arrive at the correct answer for this question. (Stem Focus) - How are B.2/D.2 answer choices incorrect? Would a procedural tie be more appropriate here (i.e. IAW 3-EOP-FR-S.1, operators will confirm the Turbine Trip by observation of ___). (Partially correct) Rev 2 comment - 4th bullet is required to answer the question. Procedure incorporated into 2nd half question. Rev 3 comment - Revised 1st half question statement for clarity. Rev 4 comment - Question is SAT.
9	H	3												N	S	Rev 0 comment - First half question technically has multiple correct answers. Both depressurization and cooldown are performed after ruptured SG isolation in E-3. - Second half question also has multiple correct answers (as indicated in justification statements). The entire basis for performing both depress and cooldown are to minimize 1° to 2° leakage. Rev 1 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
10	F	3												M (2010 Turkey Point)	S	Rev 1 comment - What is the basis for the 3rd Given Condition bullet? Does not appear to be used to answer this question. (Stem Focus) - There is no indication of a SG tube rupture performed for this question. How are A.2/C.2 distractors plausible? (Credible distractors) (?) Can revise 2nd half question to incorporate 140#/ 220# or "ECA-0.0 does/does NOT specify maintaining SG pressure > 140 psig") Rev 2 comment - Recommended changes incorporated into question. Rev 4 comment - Question is SAT.
11	H	3												N	S	Rev 0 comment - A closer K/A tie is available for this question (conversion to 1x4 question from 2x2 using a given set of indications). (no revision required) Rev 1 comment - Question is now composed of two separate concepts (i.e. whether a Rx Trip occurs due to loss of power panel and how CFT indications are affected by loss of power panel). 1st half question is a tack-on question. (Stem Focus) Rev 2 comment - Will revert to using the pre-review question instead of the Draft version for this question. Question would then be considered SAT. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
12	F	3												N	S	Rev 1 comment - Revise 1st half question to read, "The 3C Normal Inverter will AUTOMATICALLY/ requires MANUAL transfer to the CVT. (Stem Focus) - As written, there appears to be multiple correct answers to the 2nd half question. A procedural tie should be used here to differentiate the answer choices (i.e. "IAW 3-ONOP-003.5, operators will open xxx to support restoration of the 3D23 Bus"). (Partially correct) Rev 2 comment - Both comments incorporated into question. Rev 4 comment - Question is SAT.
13	H	3												N	S	Rev 1 comment - Use of the phrase "will be" in the question statements implies an operator action. Revise question statements to read, "Based on the given conditions, 3B/3C ICW Pump will AUTOMATICALLY/ requires a MANUAL start. (Stem Focus) Rev 2 comment - Comment incorporated. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
14	F	3												N	S	Rev 1 comment - What is basis for including the 2nd Given Condition bullet? Appears that this can be removed. (Stem Focus) - K/A is not matched by this question. Question posed is a setpoint question related to the IA header isolation valves. (Q=K/A) - Justification statement for C.1/D.1 distractor refers to the hogging jet. There doesn't appear to be any stem information to support making any determination based on operation of the hogging jet. (Credible distractors) - How are the A.2/C.2 distractors plausible with the given un-isolable IA leak? Additionally, justification statement specifies potential evaluation of H2 makeup as a justification for this distractor. There doesn't appear to be any such evaluation included with this question. (Credible distractors) Rev 2 comment - Still a "F" LOK question. 1st comment incorporated. Rev 3 comment - Question significantly revised. Given an IA line break on U3 with indications, 1st half question- "U3 IA system will be automatically/ requires manual isolation from U4", 2nd half question- "IA press to U3 Turb Area will be automatically/requires manual isolation." Rev 4 comment - Grammer of answer choices revised. Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
15	F	3												N	S	Rev 1 comment - Remove “Assuming no operator action”. This is addressed in NUREG-1021, Appendix E. Applicants should assume normal plant response unless specific conditions are stated in the question. (Stem Focus) - Incorporate an indication of grid frequency to ensure plausibility of C.1/D.1 distractors (e.g. Grid Frequency indicates 60 Hz and steady). (Stem Focus) - Justification statement for A.2/C.2 distractor doesn’t align with wording of distractor. Is the intent for this half answer choice to ask whether a uV trip of the RCP’s will result in a direct reactor trip? Conversely, is critical reactor operation permitted following a trip of all RCP’s? As written, the A.2/C.2 distractor doesn’t appear to be plausible. (Credible distractors) - Justification statement for A.1/B.1 answer choice states that TCS is in manual, however the reference provided states that the Main Turbine “should” be maintained in MANUAL control. Is there a potential for an incorrect answer selection based on an unstated assumption? (Stem Focus) Rev 2 comment - First two comments applied to question. Rev 3 comment - Revised 2nd half question to ask if degraded load center voltage provides a direct reactor trip. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
16	H	3												N	S	Rev 1 comment - Is the intent of the first half question to be "IAW ECA-1.2"? What aspect of the 1st half question disqualifies C.1/D.1? (Stem Focus) - How is selection of the B.2/D.2 distractor plausible? What given information justifies that SI has actuated and could require termination? (Credible distractors) - 2nd half portion of this question appears to reside at the SRO level of knowledge (procedure selection). (SRO only) Rev 2 comment - 1st comment applied. Question revised to be a 1x4 asking for which parameter is used to verify leakage isolation. Rev 4 comment - Question is SAT.
17	H	3												M (2010 Turkey Point)	S	Rev 1 comment - Is an unstated assumption required to answer the first half question (i.e. operation of RHR/CSP pumps)? RHR/CSP pumps are not addressed in given conditions. (Stem Focus) (?) An option is available for the 1st half question is to state, "IAW ECA-1.1, the 3A Charging Pump is/ is NOT required to be secured". - Revise CET subcooling to be a value greater than 69°F to assure plausibility of A.2/C.2 distractors. These distractors are currently implausible with the question as written. (Credible distractors) Rev 2 comment - RHR/HHSI pump conditions are now provided in initial conditions (all running on Unit 3). Removed mention of CSP pumps from answer choices. CET subcooling changed to 70F. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
18	H	3												N	S	Rev 1 comment - 5th Given condition bullet can be removed, stated in question stem. Is 2nd bullet required? (Stem Focus) - Wording of 1st half question statements is confusing. Appears that intent of question was to test knowledge of RPV vent usage. (Stem Focus) (?) "To establish an RCS bleed path IAW FR-H.1, operators will/ will NOT open all RCS vents." - It is implausible that charging pumps would be secured or not used in FR-H.1 (plausibility of A.2/D.2 distractor). Can be revised. (Credible distractors) (?) "BOTH Charging Pumps are/ are NOT required." Or "BOTH/ ONLY one Charging Pump(s) are required." Rev 2 comment - 1st comment above incorporated. 1st half question modified to test FIRST flowpath used "PORV's/RCS Vent Valves". 2nd half question is modified to ONLY ONE/ ALL AVAILABLE. Rev 3 comment - To ensure plausibility for 2nd half question, new bullet added that states "3A CCP is OOS" Rev 4 comment - Question is SAT.
19	H	3												N	S	Rev 0 comment - Initial condition of "**Unit 3 is at 50% power and stable**" is provided with the given initial PRNM information. Rev 1 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
20	H	3												N	S	Rev 1 comment - Remove “Assuming no operator action”. This is addressed in NUREG-1021, Appendix E. Applicants should assume normal plant response unless specific conditions are stated in the question. (Stem Focus) Rev 2 comment - Removed per comment above. Rev 4 comment - Question is SAT.
21	F	3												N	S	Rev 1 comment - Question is SAT.
22	F	3												N	S	Rev 1 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
23	F	3												N	S	Rev 1 comment - Remove Given conditions and 3rd Subsequently' bullet. Information not needed to answer the given question and plant equipment is assumed to operate as designed unless stated in a given question. (Stem Focus) - A.1 and B.1 answer choices appear to be unclearly portrayed. Based on the provided reference, manual operation (assumed to be direct, i.e. using the local valve operator) of RCV-014 is not attempted in the event of automatic valve closure failure. Instead, driving the hand loader to zero (air actuated valve?) is performed. (Stem Focus) (?) An option available is to revise 1st half question to read, "Based on the conditions above, manual operator action is/ is NOT required to close RCV-014". - Verify no overlap between question knowledge required to answer this question and 1st bullet under field operator report for SRO Question #83. Rev 2 comment - 1st comment applied. Revised question order for clarity. Question #83 bullet adjusted to simply state that RCV-14 is closed (remove overlap issue). Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
24	F	3												N	S	Rev 1 comment - Insert a “comma” (i.e. ,) after the word LOCAL in the question statement. (Editorial) - Answer choice A is implausible and requires repair (single implausible distractor). - All distractors for this question are false. This question is a collection of True/False statements as only answer choice C (the correct answer) is a true statement. Revision of at least one additional answer choice to make it a “true” statement (but not correct based on the question statement) is required. (T/F) Rev 2 comment - Editorial comment applied. Changed A distractor to make it possible but not correct for the question. Facility has a LOD concern with question. Rev 3 comment - Facility to pursue variation of: (?) “WOOTF is correct for 1606 accept criteria during performance of 3-OSP-300.1? Testing of the 1606 does/ does NOT require local/remote sw in remote. With remote/local sw in local, the annunciator is required to be in alarm/ clear. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
25	F	3												N	S	Rev 1 comment - 2nd half question is a tack-on question unrelated to the 1st half question or the given K/A statement (i.e. focused only on the high RCS activity component of the situation). (Stem Focus) - It is unclear with the given question, if Failed fuel-monitoring equipment is being evaluated with the question statement. Does this question only concern normal operation of R-3-20 in an alarming state? (Potential Q=K/A for first half question) Rev 2 comment - "F" LOK question. Question modified, 1st half question asks what happens to letdown in the event of high PRMS activity (R-3-20), 2nd half question asks if RO will/ will NOT perform operability check of R-3-20 per procedure. Rev 4 comment - Question is SAT.
26	F	3												M (2010 Turkey Point)	S	Rev 1 comment - Question is SAT.
27	H	3												N	S	Rev 1 comment - Question is SAT.
28	H	3												M (2009 Turkey Point)	S	Rev 1 comment - Question listed as a Bank question, but this is actually a modified question. - Question statement reference to SI effect (i.e. effect of this SI actuation on RCPs) listed in conjunction with MSLB outside containment removes plausibility from answer choices A and B (phase B listed as justification). (Cueing) Rev 2 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
29	H	3													S	Rev 1 comment - 1st half question is a tack-on question unrelated to the 2nd half question or the given K/A statement (i.e. procedure selection to mitigate Tref failure vs. CVCS impact). (Stem Focus) (?) Perhaps Tref failure value can be asked as it pertains to B4/4 annunciator response procedure entry criteria and incorporated as 1st half question. Rev 2 comment - Question is fine as is, the second half question is ordered in a way that is peculiar. Facility will look at order to revise question. Rev 3 comment - VCT level bullet removed, ANN B4/4 alarms with "picture of recorder" Tref-561, Tave-pegged high, 1st half question revised to read "CCP speed lowers/increases.", 2nd half question remains similar with new answer choice- "trip applicable bistables" (1st half, old to 2nd half, new). Remove procedure numbers from end of answer choices. Rev 4 comment - Question is SAT.
30	F	3												N	S	Rev 1 comment - Plausibility for answer choices B, C, and D all rely on the misconception that seal return header pressure is > CCW pressure. The as-written question only requires knowledge of seal return/CCW D/P values. As-written question contains a form of collection of T/F statements. (T/F) (?) To correct, at least one of the distractor choices requires modification to be true but unrelated to receipt of annunciator H8/6. Rev 2 comment - Stem revised to ask about ARP response, tube leakage verified by: chemical level. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
31	H	3												B (2010 Turkey Point)	S	Rev 1 comment - Justification statement for answer choice A is unclear. How is "Time to Boil" addressed by answer choice A? - Revise Subsequently statement to read, "The Manipulator Crane Operator requests that the 4B RHR Pump be stopped or RHR flow be reduced to less than 1000 gpm for 2 hours (duration of activity). Revise answer choice A to read, "flow is allowed **to** be reduced 1000 gpm for duration of activity, then raised back to 3500 gpm." Rev 2 comment - All comments incorporated. Rev 4 comment - Question is SAT.
32	F	3												N	S	Rev 1 comment - Question is SAT.
33	F	3												N	S	Rev 0 comment - Cueing of a low pressure plant condition is provided in the stem information. There are three instances where the phrase "Low Pressure" is utilized in addition to the given low pressure value and the provided task (drawing a bubble). Rev 1 comment - Question is SAT.
34	H	3												N	S	Rev 0 comment - Remove the first statement after "Subsequently" as this implies that a reactor trip is a required action of 3-ONOP-030 (i.e."teaching" in the question stem) - Answer choice B doesn't appear to be plausible based on the given DCS information compared to the actual answer choice. The given DCS information indicates that the "Motor Bearing Cooling Water Hi Temp Alarm" is GREEN and indicated as NORMAL for all RCPs. Why would a NORMAL indication be trip criteria for all RCP's? Rev 1 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
35	H	3												N	S	Rev 1 comment - Is MANUAL valve operation ever removed due to a permissive? Unless mistaken, how are answer choices B2/D2 plausible? Justification statement mentions a manual block, but question is clearly focused on use of a specific PRZ permissive. (Credible distractors) Rev 2 comment - Steam dumps to condenser become unavailable when < 20" vac. There is precedent for this concept however, additional work is required for second half question. Rev 3 comment - Facility has revised this question. PT-3-445 failure high with plant initially at 50% power, with no operator action, final expected plant response… A. Pzr press cycle at 2000 # B. Pzr press cycle at 2335# C. Unit trip on Hi Pzr lvl (potential correct answer, ensure justification statement proves this is incorrect) D. Unit trip on low Pzr Press Rev 4 comment - Question revised following Prep Week conversation. Question is SAT.
36	H	3												N	S	Rev 1 comment - Question is SAT.
37	H	3												B	S	Rev 1 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
38	H	3												N	S	Rev 1 comment - Remove "Assuming no operator action". This is addressed in NUREG-1021, Appendix E. Applicants should assume normal plant response unless specific conditions are stated in the question. (Stem Focus) - This question appears to be valid if the CCW system were specified in the K/A (i.e. knowledge of power supplies/effect of loss of power as they relate to CCW). The as-written question does not address NUREG-1122 K/A area 013, Engineered Safety Features Actuation System. (Q=K/A) (?) Perhaps a ESFAS logic timer/manual reset question related to loss of power supply? Or, ESFAS instrument power supply/effect question? - Ensure this is a Higher Cognitive question. Rev 2 comment - First comment incorporated. CCW is considered an ESFAS system in the UFSAR (Table 8.4-1) and 3-OSP-203.1. Rev 4 comment - Question is SAT.
39	F	3												N	S	Rev 1 comment - As-written, the 1st half question is unclear what system is being asked about (i.e. chilled water?, system usage?). (Stem Focus) (?) Was the following statement intended: "To address elevated containment temperature conditions, operators will/ will NOT align chilled water from the Supplemental Cooling System (SCS) to Normal Containment Cooling (NCC?) IAW NOP-030.01, xxx" - Second half question statement should be shortened. "An elevated containment temperature __(2)__ cause an AUTOMATIC isolation of the Supplemental Cooling System (SCS)." Rev 2 comment - 1st half question revised as above (without procedure #). 2nd half question revised as recommended above. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
40	F	3												N	S	Rev 1 comment - Justification statement for 1st half question specifies a TS limit. There is no mention of TS limit evaluation in the question statement. Additionally, with the plant initially at 100% power, it is not plausible that the given casualty (SLB inside containment) would **not** result in adverse containment conditions. Particularly since there is no bounding on the question statement (i.e. 1 min after the casualty or 10 hours after the casualty). (Credible distractors) Rev 2 comment - Will incorporate an additional bullet under 'Subsequently' to state a peak containment pressure (15 psig) to ensure CSP actuation does not affect answers and adds plausibility for 1st half question distractor statements. Rev 4 comment - Question is SAT.
41	F	3												N	S	Rev 1 comment - Multiple correct answers since there is no question bounding for 2nd half question and the only given condition is "17 psig and rising". (Partially correct) (?) Can be addressed by adding a time component to this question, i.e. "casualty occurred at 1000" with containment pressure "14 psig and rising at 1 psig/min", 2nd half question could read: "At 1002, MOV…, is/ is NOT open." (no need for the word expected) Statement of "17 psig and stable" may also work (verification required). Rev 2 comment - Time component added to ensure only one correct answer, as recommended above. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
42	F	3												M (2013 Turkey Point)	S	Rev 1 comment - Question is SAT.
43	F	3												N	S	Rev 1 comment - Revise the 1st given condition to state, "Unit 3 is stable at 24% power" (Stem Focus) Rev 2 comment - Comment incorporated above. Rev 4 comment - Question is SAT.
44	H	3												N	S	Rev 1 comment - Unstated assumption required to answer this question (i.e. applicants have to assume no change in SGWL moving forward, which may not be appropriate). (Stem Focus) (?) Can correct by re-wording answer statements for 1st half question to: "… have/ have NOT automatically **tripped**". (?) Can correct by re-wording 2nd half question to: "The Main Feedwater Control Valves **have automatically** __(2)__ closed". Rev 2 comment - Comment incorporated above. Rev 4 comment - Question is SAT.
45	F	3												N	S	Rev 1 comment - Question is SAT.
46	H	3												B (2009 Turkey Point)	S	Rev 1 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
47	H	3												M (2010 Turkey Point)	S	Rev 1 comment - 2nd bullet of given conditions appears to be misplaced and should be relocated under the Subsequently information. Also, 2nd bullet of given conditions appears to provide power supply cueing. Revise this bullet to read, "The 3A Inverter has failed". (Stem Focus, Cueing) (?) Is the information that "loads are verified on the CVT" required to answer this question? - 3rd bullet of given conditions appears to provide power supply cueing. Revise this bullet to read, "The BS Inverter is in service". (Cueing) Rev 2 comment - Comments incorporated. Rev 4 comment - Question is SAT.
48	H	3												N	S	Rev 1 comment - Is this question being asked with respect to a procedure? It appears that all first half answer choices can be considered correct with the as-written question. Justification statement for 1st half answer choice specifies that Rx Trip has precedence, where is the procedural reference for this? (Partially correct, Stem Focus) (?) The 1st half question could be asked from a procedural perspective, however, that may elevate this question to the SRO LOK. It would be more appropriate to revise the 1st half question to read, "Based on the conditions above, a reactor trip has/ has NOT occurred." (?) To remove overlap issue between 1st and 2nd half question statements, 2nd half question can be revised to read, "**In the event of a subsequent SI signal**, the Unit 4 Train B …" Rev 2 comment - Comments incorporated. Rev 4 comment - Question is SAT.
49	F	3												N	S	Rev 1 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
50	H	3												M	S	Rev 1 comment - 2nd half answer is cued by stem information "reduce". (Cueing) (?) Revise question statement to read, "To adjust 3A EDG reactive load to a setting of 700 kVAR LAG, an adjustment of the 3A EDG __(1)__ switch in the __(2)__ direction is required." - Language of justification statement should be consistent with as-written question (use of VARS in/out vs. LEAD/LAG) Rev 2 comment - Comment incorporated above. Rev 4 comment - Question is SAT.
51	H	3												N	S	Rev 1 comment - Addition of 3rd given condition bullet is confusing when addressing the question. A question should not be written to add ambiguity or to increase uncertainty. (Stem Focus) - Based on the subject matter being requested, the second half question may exceed the RO LOK due to asking about administrative requirements not contained in the RO job function. (Job-Link, LOD) Rev 2 comment - 1st comment incorporated above. Rev 3 comment - Facility has tied subject matter to learning objective to ensure RO LOK. Facility will use Obj# 6918150, 9.e to ensure RO LOK tie. Rev 4 comment - Revision to question stem required for clarity. Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
52	H	3												N	S	Rev 1 comment - Addition of both the 1st and 2nd bullets under Subsequently is not required to answer this question. Provides cueing for 1st half question. Remove 2nd bullet under Subsequently. (Cueing) - Addition of the 2nd bullet under given conditions and the 3rd bullet under Subsequently statements doesn't appear to be required to answer this question. Both statements can be removed. (Stem Focus) Rev 2 comment - Editorial changes performed to remove cueing and ensure stem focus. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
53	H	3												M (2013 Turkey Point)	S	Rev 1 comment - Information included in stem that doesn't appear to be required to answer the question. (Stem Focus) (?) Remove 2nd bullet under Subsequently - B2 and D2 distractor statement is implausible with 2nd half question statement (i.e. power reduction on loss of cooling water flow is never a wrong answer choice when unable to restore plant parameters). (Credible distractors) (?) Can revise question statements to read, "IAW 4-ONOP-019, The crew will throttle 4-50-401, xxx,/ 4-50-406, xxx to ensure less than 18,500 gpm total ICW flow/ 110 degrees TPCW Hx outlet temperature." Rev 2 comment - Question modified to incorporate 1st comment above and incorporated question restructure above (2nd half answer choices toggle between flow/motor amps). Facility to incorporate a motor amp reading into question stem to ensure plausibility of 2nd half distractors. Rev 3 comment - Facility took snapshot of board indications to incorporate into question. Since simulator used was U3, revised question to be U3. Facility to use ammeter indication that shows pump operation outside normal range. 1st half question – required to manipulate, 401/407, 2nd half question – what is required to be monitored, ICW temp/motor amps. Rev 4 comment - Replace the word 'throttle' with 'manipulate'. Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
54	H	3												M (2010 Turkey Point)	S	Rev 1 comment - Question is labelled as Bank but appears to be Modified. - Revise 2nd bullet under Subsequently to read, "Both control room instrument air pressure indicators slowly lower to 96 psig before rising to, and stabilizing at, 110 psig." (Stem Focus) - Answer choices don't read correctly due to being separated, revise question statement to combine, (e.g. ELECTRIC LAG Compressor has failed to start and DIESEL STANDBY-LEAD Compressor is running loaded) (Stem Focus) Rev 2 comment - 1st two comments incorporated above. Last comment applied to question. Rev 4 comment - Question is SAT.
55	H	3												M (2013 Turkey Point)	S	Rev 1 comment - Question is labelled as Bank but appears to be Modified. - Question is SAT.
56	F	3												N	S	Rev 1 comment - How is it plausible for Unit 4 power supplies to be considered as normal Unit 3 MG set power supplies (answer choices A and C)? Are cross-unit power supplies present for any other component in the CRD system? (Credible distractors) (?) Can revise A and C answer choices to have cross-divisional Unit 3 power supplies. Rev 2 comment - Facility to pursue use of other power supplies Rev 3 comment - Facility revised question to state "CR MG Sets are powered from Vital/ Non-Vital power supplies from Load Centers/ MCC's." Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
57	H	3												N	S	Rev 1 comment - Remove “Assuming no operator action”. This is addressed in NUREG-1021, Appendix E. Applicants should assume normal plant response unless specific conditions are stated in the question. (Stem Focus) - Does this failure (LT-3-459) have overlap with the scenario operating test? - Does the justification statement for answer choice C imply that an unstated assumption is required to answer this question (i.e. plant in Position 2)? What “Position” is justification statement referring to? Rev 2 comment - No overlap concern with scenario sets. Justification statement adjusted. Rev 4 comment - Question is SAT.
58	F	3												N	S	Rev 1 comment - Revise question statement for clarity and to eliminate multiple correct answers, “**The** At Power Reactor Trips will be enabled when **a MINIMUM of** __(1)__ Power Range Nuclear Instruments read **a MINIMUM of** __(2)__ reactor power.” (Stem Focus, Partially correct) Rev 2 comment - Comments applied above. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
59	H	3												M (2013 Turkey Point)	S	Rev 1 comment - Of the answer choices presented, only one concerns a parameter change (the correct answer), with all others relating to equipment operation. Revise one distractor to be a parameter change (e.g. A. Containment pressure rises). (Credible distractors) - The change performed above will reclassify this question as modified. Rev 2 comment - 'A distractor' revised to state that Containment Pressure rises. Rev 4 comment - Question is SAT.
60	F	3												N	S	Rev 1 comment - Question is SAT.
61	H	3												N	S	Rev 1 comment - What is basis for use of 43% as justification for B2/D2 distractors (no reason provided in write-up)? Calculation performed to justify correct answer choice resulted in 42%. (Credible distractors) (?) Can correct by revising B2/D2 answer choices to 58%. Rev 2 comment - Comment incorporated. Rev 4 comment - Question is SAT.
62	F	3												N	S	Rev 1 comment - Is any indication of condenser air-in leakage available for another screen on the DCS display? Is this half question asking whether air-in leakage can be detected or if there is a dedicated air-in leakage parameter reading available? (Partially correct) Rev 2 comment - 2nd half question revised to state "… leakage readout is/ is NOT available." Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
63	H	3												N	S	Rev 1 comment - 2nd half question revision required. Rev 2 comment - 2nd half question revised to ask if Rx trip is required. Rev 4 comment - Question is SAT.
64	F	3												N	S	Rev 1 comment - Question is SAT.
65	F	3												N	S	Rev 1 comment - Answer choices C1/D1 are implausible due to use of deluge system as fire pump initiator. (Credible distractors) (?) Revise 1st half question and answer choices to state, "The fire pumps receive an AUTOMATIC start signal from a pressure/ flow actuated switch in the fire main header." Rev 2 comment - Comments incorporated above. Rev 4 comment - Question is SAT.
66	F	3												N	S	Rev 1 comment - Question is SAT.
67	H	3												N	S	Rev 1 comment - Specify switch being asked for in the question statement. Revise question statement to read, "Which ONE of the following identifies (1) **the location of the 480V LC3H Transfer control switch** and (2) the …" (Stem Focus) Rev 2 comment - Comment incorporated. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
68	H	3												N	S	Rev 1 comment - Question is SAT.
69	F	3												N	S	Rev 1 comment - All 2nd half answer choices are correct for the as written 2nd half question. Revise the second half question to read, "… requires the crew to check __(1)__ **is maintained above a MINIMUM of** __(2)__." (Partially correct) Rev 2 comment - Comment incorporated. Rev 4 comment - Question is SAT.
70	F	3												N	S	Rev 1 comment - Revise the 1st half question statement to read, "OP-AA-102-1003, xxx, **requires** __(1)__ **be guarded.**" (Stem Focus) Rev 2 comment - Comment incorporated. Rev 4 comment - Question is SAT.
71	F	3												B	S	Rev 1 comment - Insufficient information provided in the question stem to completely answer this question. (Stem Focus) (?) Revise 2nd bullet of given conditions to read, "Following an audit of available diesel lubricating oil, it is discovered that there is no additional diesel lubricating oil available on plant site apart from what is already in each respective EDG sump." Rev 2 comment - Stem information condensed (2nd bullet revised). Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
72	H	3												M (2013 Turley Point)	S	Rev 1 comment - Question is SAT.
73	F	3												N	S	Rev 1 comment - Question statement reads unclearly, revise question statement to read, "0ADM-211, xxx, **permits performance of a crew brief** prior to transitioning to ____. (Stem Focus) Rev 2 comment - Comment applied. Rev 4 comment - Question is SAT.
74	H	3												B (2013 Turkey Point)	S	Rev 1 comment - Question is SAT.
75	H	3												B (2009 Point Beach)	S	Rev 1 comment - Is answer choice B intended to be worded as "RED path exists for Subriticality"? Justification statement doesn't match answer choice. Rev 2 comment - Comment incorporated, no change to question. Rev 4 comment - Question is SAT.
76	H	3												M (2011 Seq)	S	Rev 1 comment - Question is SAT.
77	H	3												N	S	Rev 1 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
78	H	3												N	S	Rev 1 comment - Incomplete justification statement for correct answer choice D. Rev 2 comment - Comment applied above. Rev 4 comment - Question is SAT.
79	H	3												N	S	Rev 0 comment - Unsure that a sufficient justification for answer choices A.2 and C.2 is met based on the wording of the portion cited in 0-ADM-211, "When any EOP is in effect, ONOPs may be performed in the discretion of the US or SM, only if they do **NOT** interfere with the actions called for in the EOPs…" The above cited wording seems to indicate that simultaneous performance of an EOP and ONOP is never required, but may be performed by the US/SM if desired. If this interpretation is correct, then answer choices A.2 and C.2 are implausible (since the requirement is never mandatory as implied by the answer choices). Rev 1 comment - To support justification of A.2/C.2 distractor (using the as written justification statement), does the 2nd bullet under Subsequently need to be revised to read, "4-EOP-E-0, xxx, **IOAs are in progress**"? Rev 2 comment - Revised 2nd bullet under 'Subsequently' to state that EOP-E-0 is in progress (which implies that IOA's are in progress). Still supports A2/C2 distractors. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
80	H	3												N	S	Rev 0 comment - The provided information indicates that a Main Generator issue is present (i.e. MVAR fluctuation, GEN FIELD annunciator, generator EXCITATION light report by TO). These cues serve to eliminate plausibility of the C.1 and D.1 distractors. - Since there is no bounding of the second half question statement (and due to the choices presented), it appears that either answer to the second half question can be considered correct (i.e. notify either/both the Load Dispatcher as well as the System Engineer). Rev 1 comment - Revise 1st half question statement to read, "**The US will direct maintaining Main Generator Reactive Load below a MAXIMUM of __(1)__**." (Stem Focus) - What is the basis for including kV, MWe, and H2 pressure in the list of supplied Unit 3 Main Generator parameters? None of these appear to be required to answer this question. These can be removed. Rev 2 comment - 1st half question revised as suggested, reference still required to answer this question. Rev 4 comment - Question is SAT.
81	H	3												B	S	Rev 0 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
82	H	3												M (2010 Turkey Point)	S	Rev 1 comment - Revise first two bullets under Subsequently (or combine them) to clearly define where the dropped spent fuel assembly is (i.e. dropped in pool, over core, etc…). Answer choices appear to imply dropped fuel is in the Spent Fuel Pool. (Stem Focus) - 2 pages of justification statements for this question (Pages 452 and 453). Remove page that does not apply. - It appears that B2/D2 distractor statement is implausible based on given conditions. Closure of SFP drain path is inconsistent with required actions for a gaseous radiological release. (Credible distractors) (?) A more appropriate distractor would be for B2/D2 distractor to read, “Place CR HVAC in service” Rev 2 comment - Facility to revise. Rev 3 comment - Question to remain as is with the exception of 2nd half answer choice B2/D2 is now “Close the Equip Hatch Fast Closure Door”. 2nd bullet under subsequently is also removed (gas bubbles). Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
83	H	3												M (2010 Turkey Point)	S	Rev 1 comment - Verify no overlap between 1st bullet under field operator report and question knowledge required to answer RO Question #23. - Why is 1st bullet under field operator actions included in the question stem? Isn't this an expected plant response following receipt of the PRMS R-14 high alarm? This bullet can be removed. (Stem Focus) - Revise 1st half question statement to read, "The US will direct **re-alignment of the waste gas system in accordance with __(1)__**. - 2nd half question is asking for an overall mitigative strategy to deal with a leaking Gas Decay Tank. This is RO LOK. This can remain at the SRO LOK by altering the question statement/answer choices. (SRO Only) (?) Revise 2nd half question statement to read, "The contents of the B GDT are/ are NOT required to be transferred to another GDT." Rev 2 comment - Facility to revise Rev 3 comment - Filling GDT information is removed. RCV-014 valve information is removed. 1st half question revised as suggested above. 2nd half question revised as stated above. No overlap concern. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
84	F	3												N	S	Rev 1 comment - According to the EAL tables (Att 1 – F668, Rev 12, Page 9). It appears that both 1st half answer choices can be selected as correct due to the given condition of lowering SFP level. RA2 merely requires SFP level drop sufficient to uncover fuel while RU2 requires SFP in conjunction with a valid ARM reading. (Partially correct) (?) Is there some SFP design feature that limits SFP drain-down due to leak location (i.e. impossible to uncover fuel)? - Per 0-EPIP-20134, rev 7, notification of state and local authorities is required within 15 minutes for the as-given conditions. Justification statement refers to 30 minutes. Which is procedurally correct? Based on the provided reference, it appears that the B2/D2 distractor is implausible. No information could be found in EPIP-20134 to support use of a 30 minute distractor. (Credible distractors) Rev 2 comment - Differentiation of Alert vs. UE requires knowledge that fuel CANNOT be uncovered based on given conditions. Justification for this knowledge area is required to be incorporated into this question. - Revise question statement to read, "The EC is required to notify the State of __(1)__ declaration by __(2)__. Rev 4 comment - Question is SAT.
85	H	3												N	S	Rev 1 comment - Are the given conditions intended to imply that the Orange Path occurred independently of the operator action to place CSP's in P-T-L? Appears that the 4th bullet under given conditions should be placed under a new initial condition 'Subsequently' section. (Stem Focus) Rev 2 comment - Comment incorporated. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
86	H	3												N	S	Rev 1 comment - 1st half question statement indicates that operators are to assume no additional operator action, however, isn't the applicant expected to assume that Unit 4 HHSI pumps are aligned and placed into service in order to mitigate the CET temperature rise? Justification seems to support this. Unsure how to fix unless 1st half question statement is re-worded. (Stem Focus) - Appears to be multiple correct answers based on the wording of the question statements (i.e. applicant assumes < 700F CET and FR-C.3 entry, answer choice D). (Partially correct) - If the applicant is directed not to assume additional operator actions, is there technically NO correct answer to this question (i.e. requirement to enter C.2)? Rev 2 comment - Question revised to swap question statements. New 2nd half question revised to state, "If the crew fails to implement the procedure above, CET's are/ are NOT expected to rise above 700F." Rev 4 comment - Question is SAT.
87	H	3												N	S	Rev 0 comment - First half question is directly indicated by the provided reference (specifically the explanation of ACTION 3 from TS 3.3.1), this makes the first half question a direct lookup due to the little mental activity required (only one TS action statement invoked due to initial conditions). - Additionally, due to the answer choices provided, the second half question implies that the reactor startup can continue (i.e. revealing the answer to the first half question). Since the second half question is asking at what point Rx power is restricted to, this half question is a P-6 set-point question. - I am unsure of the reason behind 3/4.0 Applicability LCO inclusion as a reference to this question. There is no applicant determination of invoking LCO 3.0.4 to answer this question. Rev 1 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
88	H	3												N	S	Rev 1 comment - Question is SAT.
89	H	3												N	S	Rev 1 comment - Question is SAT.
90	H	3												N	S	Rev 1 comment - Revise the 1st half question statement to more narrowly focus this half question as a generic in the T2G1 area (as opposed to the T3 area). (Stem Focus) (?) Revise 1st half question to read, "**During crew response to the conditions stated above, the** mitigating actions of 0-ONOP-066, xxx, …" - Based on the given conditions, the 2nd half question requires little mental activity to arrive at the correct answer beyond merely locating the corresponding information in the EAL chart (LOD=1). (?) Can be corrected by revising 5th bullet under Given conditions to state, "Both CHRRMS channels read 5x10E3 R/hr". This forces evaluation of SAE vs GE; loss vs. potential loss criteria. Correct answer would also require revision to key SAE as the correct answer choice. Rev 2 comment - Comments applied above. Rev 4 comment - Question is SAT.
91	H	3												N	S	Rev 1 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
92	H	3												N	S	Rev 1 comment - Intent of 1st half question statement is unclear. This half question appears to ask detailed procedural knowledge but may not rise above the RO LOK (entry condition criteria). Additionally, the procedural knowledge specified has no procedure selection component. (Stem Focus, RO LOK?) (?) Can be corrected by revising 1st half question statement to read, "Operator action to close the Containment Purge Isolation valves will be performed following a required procedure transition to __(1)__." - 2nd half question justification statement does not match answer choice. It appears that it was intended to ask if "direct RP monitoring" vs "remote RP monitoring" was required for the given conditions. The 2nd half question (as written) does not address this concept (merely asks if containment atmospheric monitoring will be performed at all). (Credible distractors) (?) What is example of ONOP/Mode that requires remote monitoring of containment atmosphere by RP (no information provided in justification)? Is knowledge of PASS intended to be tested here? Rev 2 comment - Comment associated with 1st half question incorporated into question. Rev 3 comment - 2nd half question revised to ask "The US will direct monitoring for airborne contamination/ placing PAHMS in service." Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
93	H	3												N	S	Rev 1 comment - Multiple correct answers based on as-written 2nd half question. Isolation of the SFP Purification Loop is required at 140F, the given conditions only provide indication of 135F (based on alarm receipt). To arrive at the keyed answer requires the applicant to make an unstated assumption of continued SFP temperature rise (not provided, nor is decay heat load or time since shutdown). As written, the correct answer is A. (Partially correct) (?) To correct, simply re-key this question to indicate that answer choice A is correct. (?) Could also state that alarm is received at 1300 with SFP temperature rising at 2F/min, with second half question asking the earliest time SFP Pur. Loop is required to be isolated, 1300/ 1306. Rev 2 comment - SFP temp provided at 150F incorporated as an initial condition. Correct answer choice remains B. Rev 4 comment - Question is SAT.
94	F	3												N	S	Rev 1 comment - The given conditions are included to provide plausibility for A.1/B.1 distractor. However, MODE 1 is a poor distractor element. To maintain plausibility revise the second bullet under given conditions to state, "Unit 4 is in MODE 4". (Stem Focus) (?) Another option would be to test the STA control room reporting time (i.e. 10 minutes/ 15 minutes) Rev 2 comment - Revised given information to incorporate MODE, as suggested above. Rev 4 comment - Question is SAT.
95	H	3												B (2016 Turkey Point)	S	Rev 1 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
96	H	3												B (2012 Salem)	S	Rev 1 comment - Question is SAT.
97	F	3												B (2011 Turkey Point)	S	Rev 1 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
98	H	3												B (2016 Turkey Point)	S	Rev 1 comment - There is disagreement between the indicated reference (3.3.3.1) and provided reference (3.3.3.3) for this question. - Answer choice A is also a correct statement as transition of the plant is allowed into a MODE where unrestricted operation is permitted (i.e. invoke LCO 3.0.4). (Also, justification appears to be incorrect as it refers to return to Mode 5, where answer choice refers to Mode 4) (Partially correct) - Answer choice B could also be construed as being correct as an applicant can contend that a Mode change isn't required if the instrument is restored to operable within 72 hours (i.e. by making an unstated assumption). (Partially correct) - This question is a direct lookup with little mental activity required to arrive at the answer (merely match answer choice with provided reference information). (LOD=1) (?) Can be corrected by revising answer choice C to be incorrect (e.g. use another action statement), revising answer choice D to be correct IAW Required ACTION 34, and revising justification statements to support testing LCO 3.0.4 with answer choice A as being correct) Rev 2 comment - Facility is pursuing a LCO motherhood question that doesn't require a reference to hit this K/A. Rev 3 comment - Question revised. 1st half question- "TS does/ does NOT allow entry into Mode 2." (reference required for plausibility of this half question). 2nd half question- "The US will determine that the Cont. Rad Hi input to CR ventilation isolation is/ is NOT operable." Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
99	H	3												N	S	Rev 0 comment - Initial Conditions, 2nd bullet under 'subsequently' – revise to "Halon failed **to** automatically discharge" - How are answer choices C.1 and D.1 plausible with respect to the given first half question (i.e. actuation of Halon)? It is understood that a Control Room Evacuation is in progress due to the initial conditions. - Answer choices A.2 and C.2 are correct for two reasons since LI-AA-102-1001 specifies "declaration of any of the Emergency Classes" (i.e. EAL entry required for both HU2 as well as HA5). Additionally, since entry into ONOP-105 is specified as an initial condition, the 1 hour reportable criteria is directly cued by the question stem (due to the EALs being provided as a reference). Rev 1 comment - Justification statement for answer choice A should be revised to include that 1 hour reportable determination stems from applicant identification of EAL entry based on given information. Rev 2 comment - Comment addressed. Rev 4 comment - Question is SAT.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
100	F	3												N	S	Rev 1 comment - 1st half question statement is confusingly worded (e.g. "delegate his responsibility to decide to…"). If the subject matter is his responsibility to decide, how can he delegate it? 2nd half question has similar language (e.g. delegate his responsibility to perform). (Stem Focus, Credible distractors?) (?) This type of subject matter can be asked more clearly in a table format where the applicant is asked "which of the following identifies the EC responsibilities he can (or cannot) delegate". Pitfall of this approach is that a T/F question flaw is easy to incorporate so plausibility is vital. (?) Revise question statement to read, "Given: An Emergency has been declared and the EOF is fully staffed and operational. Which ONE of the following identifies a SM/EC responsibility that CANNOT be delegated? A. Notification of PAR to Offsite agencies B. Notification of Emergency Response Organization (ERO) *C. Notification of emergency classification to Offsite agencies D. Notification of emergency conditions to Plant Management Ref: EPIP-20104, 20101, 20134 Rev 2 comment - Question statements revised. Proposed question appears to be valid. • The decision to notify federal/state/local authorities is/ is NOT allowed to be delegated. • The action to notify is/ is NOT allowed to be delegated. Rev 4 comment - Question is SAT.