

JPM A	
p 1	Edited Task Standard
p 5	Edited "Delta" symbol on Performance Step 4
p 10	Added clarification to the Standard under Performance Step 18
p12	Removed page number from Cue Sheet
JPM B	
p 1	Edited Task Standard
p1	Removed bullet in Initial Conditions about increased Letdown flowrates
p3	Changed Event 2 items to Event 1 to reflect how the JPM was validated (Steps 2 and 3)
p3	Edited MAP malfunction under Step 1
p10	Removed bullet in Initial Conditions about increased Letdown flowrates
p10	Removed page number from Cue Sheet
JPM C	
p1	Edited second bullet of the Initial Conditions for clarity
p3	Added malfunction to Exam Setup (Step 1.C)
p6	Removed unnecessary capitalization in Standard under Performance Step 7
p7	Added Examiner Note directly following Performance Step 11
p7	Enhanced Booth Cue directly following Performance Step 12
p7	Removed unnecessary capitalization in Standard under Performance Steps 11 and 12
p13	Edited second bullet of the Initial Conditions for clarity
p13	Removed page number from Cue Sheet
JPM D	
p 1	Edited Task Standard
p9	Removed Performance Step 12
p11	Removed page number from Cue Sheet
JPM E	
p3	Changed "Trainer" to "Simulator"
p11	Removed page number from Cue Sheet
JPM F	
p2	Edited Task Standard
p2	Changed Time Critical from "Yes" to "No"
p3	Changed a Simulator Override to a Remote Function (fourth bullet from the bottom)
p4	Edited Coding nomenclature for bullets #2 and 3
p16	Changed Time Critical from "Yes" to "No"
p16	Removed page number from Cue Sheet
JPM G	
p1	Enhanced fifth and last bullets under Initial Conditions
p2	Edited third bullet under Required Materials
p9	Enhanced Evaluator Note just prior to Performance Step 16

Removed pag

p19	Enhanced fifth and last bullets under Initial Conditions
p19	Removed page number from Cue Sheet
JPM H	
p1	Edited Task Standard
p2	Removed Steps 4 and 5 under Simulator Setup due to being repeated in Steps 7 and 8
p4	Changed Font issues on Performanc Step 2
p10	Removed page number from Cue Sheet
JPM I	
p3	Added Evaluator Note prior to Performance Step 1
p6	Removed page number from Cue Sheet
JPM J	
p3	Added Evaluator Cue just after Performance Step 1
p4	Edited second Evaluator Cue after Performance Step 3 for accuracy
p5	Edited Terminating Cue
p7	Removed page number from Cue Sheet
JPM K	
P1	Added last procedure under General References
p4	Added Evaluator Note at top of page
p9	Removed page number from Cue Sheet
JPM RO A1-1	
p1	Edited Task Standard
p1	Edited Bullets #3 and 7 under Initial Conditions
p7	Edited Bullets #3 and 7 under Initial Conditions
p7	Removed page number from Cue Sheet
p8	Removed page number from Cue Sheet
p8	Changed shaded blocks for clarity
JPM RO A1-2	
p1	Edited Task Standard
p1	Removed last bullet under Initial Conditions
p12	Removed page number from Cue Sheet
JPM RO A2	
p1	Edited last 2 bullets under the first Time stamp of the Initial Conditions
p7	Edited second position in Table
p9	Edited last 2 bullets under the first Time stamp of the Initial Conditions
p9	Removed page number from Cue Sheet

JPM RO A4	
p1	Edited Task Standard
p7	Added Evaluator Cue just prior to Performance Step 10
p10	Removed page number from Cue Sheet
JPM SRO A1-1	
p1	Edited next-to-last bullet under Initial Conditions
p9	Edited next-to-last bullet under Initial Conditions
p9	Removed page number from Cue Sheet
p10	Removed page number from Cue Sheet
p11	Removed page number from Cue Sheet
JPM SRO A1-2	
p1	Edited second bullet under Initial Conditions
p1	Edited Task Standard
p2	Edited Initiating Cue
p9	Edited Evaluator Note prior to Performance Step 19
p12	Edited Initiating Cue
p12	Edited second bullet under Initial Conditions
p12	Removed page number from Cue Sheet
p13	Removed page number from Cue Sheet
JPM SRO A2	
p1	Edited last 2 bullets under the first Time stamp of the Initial Conditions
p5	Edited Standard under Performance Step 3
P9	Edited second position in Table
p11	Edited last 2 bullets under the first Time stamp of the Initial Conditions
p11	Removed page number from Cue Sheet
JPM SRO A3	
p1	Edited Task Standard
p1	Edited Initial Conditions
p2	Edited Initiating Cue
p3	Edited Performance Step 2
p5	Edited performance Step 6
p6	Edited first and third sections under Table 2
p8	Removed page number from Cue Sheet
Scenario 1	
p1	Added more to initial conditions

p1	Removed first Critical Task
p1	Changed URO to ARO for Event 4
p3	Verified no overlap with regards to MU-V-17
p10	Removed first Critical Task
p13	Added feed limits for EFW with and without RCP's
p16	Clarified remote function
p17	Clarified information to match simulator setup
p18	Clarified information to match simulator setup
p19	Changed 30 day timeclock to 7 day
p20	Edited indications available
p21	Edited indications available
p22	Added AOP-001, Fire, actions due to invalid alarms that require attention
p22	Edited to make either ventilation train possible
p24	Added note to continue with scenario
p26	Note added about OP-TM-641-404
p27	Edited indications available
p27	Edited booth cue
p28	Removed unnecessary step from top of page
p30	Edited first line for crew
p33	Edited indications available
p35	Edited Booth cue
p48	Changed EAL
Scenario 2	
p1	Edited events 3 and 5 description
p3	Edited criteria to move on from event 2
p5	Edited tech specs for event 3
p5	Edited crew actions for event 3
p17	Clarified information to match simulator setup
p18	Clarified information to match simulator setup
p20/21	Clarified note about key
p26	Edited crew action
p28	Addressed tech spec call
p28/29	Added action for MU-V-3
p28	Added to last step listed on page
p29	Edited RNO step numbers
Sceanrio 3	
p1	Added to initial conditions
p1	Edited Event #5 line
p7	Edited MS-V-5B
p15	Fixed symbol top half of page
p18	Clarified information to match simulator setup
p19	Edited first Examiner Note

p21	Edited information about no HPI flow once MUP is secured
p29	Edited examiner note
p35	Added reratio steps
p36	Edited second booth cue
p37	Edited last step on page
p38	Edited last step on page
P42	Added routing note based on procedures
Scenario 5	
p1	Rearranged events 3 and 4
p1	Added description to event 6
p1	Changed IC number
p15	Clarified information to match simulator setup
p17	Added cue about rx eng.
p23	Removed last step
p34	Typo in second step fixed
p42	Changed URO to ARO in first step

Facility: Three Mile Island		Date of Exam: 09/28/2015															
Tier	Group	RO K/A Category Points											SRO-Only Points				
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total	
1. Emergency & Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A			3	18	3	3	6
	2	1	2	1	N/A			2	2	N/A			1	9	2	2	4
	Tier Totals	4	5	4	N/A			5	5	N/A			4	27	5	5	10
2. Plant Systems	1	3	2	3	3	3	2	2	3	2	3	2	28	3	2	5	
	2	1	1	1	1	1	1	1	1	1	1	0	10	0	2	1	3
	Tier Totals	4	3	4	4	4	3	3	4	3	4	2	38	5	3	8	
3. Generic Knowledge and Abilities Categories				1	2	3	4	10	1	2	3	4	7				
				2	3	2	3		2	2	1	2					

- Note:
- Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO outlines (i.e. except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two). (One Tier 3 Radiation Control K/A is allowed if the K/A is replaced by a K/A from another Tier 3 Category.)
 - 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.
 - Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
 - 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.
 - 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.
 - Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
 - * 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.
 - On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
 - 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

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 1 (RO / SRO)						Form ES-401-2	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1	X						EK1.2 - Knowledge of the operational implications of the following concepts as they apply to the (Post-Trip Stabilization): Normal, abnormal and emergency operating procedures associated with (Post-Trip Stabilization)	3.5	
000008 Pressurizer Vapor Space Accident / 3		X					AK2.03 - Knowledge of the interrelations between the Pressurizer Vapor Space Accident and the following: Controllers and positioners	2.5	
000009 Small Break LOCA / 3					X		EA2.04 - Ability to determine or interpret the following as they apply to a small break LOCA: PZR level	3.8	
000011 Large Break LOCA / 3		X					EK2.02 - Knowledge of the interrelations between the and the following Large Break LOCA: Pumps	2.6	
000015/17 RCP Malfunctions / 4				X			AA1.02 - Ability to operate and / or monitor the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): RCP oil reservoir level and alarm indicators	2.8	
000022 Loss of Rx Coolant Makeup / 2						X	2.2.39 - Knowledge of less than or equal to one hour Technical Specification action statements for systems.	3.9	
000025 Loss of RHR System / 4			X				AK3.02 - Knowledge of the reasons for the following responses as they apply to the Loss of Residual Heat Removal System: Isolation of RHR low-pressure piping prior to pressure increase above specified level	3.3	
000026 Loss of Component Cooling Water / 8			X				AK3.02 - Knowledge of the reasons for the following responses as they apply to the Loss of Component Cooling Water: The automatic actions (alignments) within the CCWS resulting from the actuation of the ESFAS	3.6	
000027 Pressurizer Pressure Control System Malfunction / 3						X	2.4.18 - Knowledge of the specific bases for EOPs.	3.3	
000029 ATWS / 1	X						EK1.01 - Knowledge of the operational implications of the following concepts as they apply to the ATWS: Reactor nucleonics and thermo-hydraulics behavior	2.8	
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4	X						AK1.06 - Knowledge of the operational implications of the following concepts as they apply to Steam Line Rupture: High energy steam line break considerations	3.7	
000054 (CE/E06) Loss of Main Feedwater / 4				X			AA1.01 - Ability to operate and / or monitor the following as they apply to the Loss of Main Feedwater (MFW): AFW controls, including the use of alternate AFW sources	4.5	
000055 Station Blackout / 6						X	2.2.42 - Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	
000057 Loss of Vital AC Inst. Bus / 6					X		AA2.07 - Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: Valve indicator of charging pump suction valve from RWST	3.3	

000058 Loss of DC Power / 6			X				AK3.01 - Knowledge of the reasons for the following responses as they apply to the Loss of DC Power: Use of dc control power by D/Gs	3.4	
000062 Loss of Nuclear Svc Water / 4					X		AA2.02 - Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: The cause of possible SWS loss	2.9	
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4			X				EK2.1 - Knowledge of the interrelations between the (Inadequate Heat Transfer) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.8	
000077 Generator Voltage and Electric Grid Disturbances / 6					X		AA1.04 - Ability to operate and/or monitor the following as they apply to Generator Voltage and Electric Grid Disturbances: Reactor controls	4.1	
000009 Small Break LOCA / 3						X	2.4.41 - Knowledge of the emergency action level thresholds and classifications.	4.6	
000011 Large Break LOCA / 3						X	EA2.01 - Ability to determine or interpret the following as they apply to a Large Break LOCA: Actions to be taken, based on RCS temperature and pressure - saturated and superheated	4.7	
000015/17 RCP Malfunctions / 4						X	AA2.09 - Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): When to secure RCPs on high stator temperatures	3.5	
000057 Loss of Vital AC Inst. Bus / 6						X	2.4.30 - Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.	4.1	
000058 Loss of DC Power / 6						X	2.4.11 - Knowledge of abnormal condition procedures.	4.2	
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1						X	EA2.1 - Ability to determine and interpret the following as they apply to the (Vital System Status Verification): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	4.0	
K/A Category Totals:	3	3	3	3	3/3	3/3	Group Point Total:		18/6

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (RO / SRO)						Form ES-401-2	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000005 Inoperable/Stuck Control Rod / 1		X					AK2.01 - Knowledge of the interrelations between the Inoperable / Stuck Control Rod and the following: Controllers and positioners	2.5	
000024 Emergency Boration / 1				X			AA1.19 - Ability to operate and / or monitor the following as they apply to Emergency Boration: Makeup control system selector switch for CVCS isolation valve	3.2	
000033 Loss of Intermediate Range NI / 7					X		AA2.03 - Ability to determine and interpret the following as they apply to the Loss of Intermediate Range Nuclear Instrumentation: Indication of blown fuse	2.8	
000036 (BW/A08) Fuel Handling Accident / 8	X						AK1.1 - Knowledge of the operational implications of the following concepts as they apply to the (Refueling Canal Level Decrease): Components, capacity, and function of emergency systems.	3.7	
000051 Loss of Condenser Vacuum / 4			X				AK3.01 - 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	
000069 (W/E14) Loss of CTMT Integrity / 5		X					AK2.03 - Knowledge of the interrelations between the Loss of Containment Integrity and the following: Personnel access hatch and emergency access hatch	2.8	
BW/A01 Plant Runback / 1						X	2.1.25 - Ability to interpret reference materials, such as graphs, curves, tables, etc.	3.9	
BW/A05 Emergency Diesel Actuation / 6					X		AA2.2 - Ability to determine and interpret the following as they apply to the (Emergency Diesel Actuation): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	3.5	
BW/E13&E14 EOP Rules and Enclosures				X			EA1.2 - Ability to operate and / or monitor the following as they apply to the (EOP Enclosures): Operating behavior characteristics of the facility.	2.8	
000024 Emergency Boration / 1						X	2.4.6 - Knowledge of EOP mitigation strategies.	4.7	
000036 (BW/A08) Fuel Handling Accident / 8					X		AA2.02 - Ability to determine and interpret the following as they apply to the Fuel Handling Incidents: Occurrence of a fuel handling incident	4.1	
BW/A02&A03 Loss of NNI-X/Y / 7					X		AA2.1 - Ability to determine and interpret the following as they apply to the (NNI-X): Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.0	
BW/E08; W/E03 LOCA Cooldown - Depress. / 4						X	2.4.18 - Knowledge of the specific bases for EOPs.	4.0	
K/A Category Point Totals:	1	2	1	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	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
003 Reactor Coolant Pump					x							K5.02 - Knowledge of the operational implications of the following concepts as they apply to the RCPS: Effects of RCP coastdown on RCS parameters	2.8	
003 Reactor Coolant Pump						x						K6.14 - Knowledge of the effect of a loss or malfunction on the following will have on the RCPS: Starting requirements	2.6	
004 Chemical and Volume Control				x								K4.10 - Knowledge of CVCS design feature(s) and/or interlock(s) which provide for the following: Minimum temperature requirements on borated systems (prevent crystallization)	3.2	
005 Residual Heat Removal								x				A2.04 - Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: RHR valve malfunction	2.9	
005 Residual Heat Removal										x		A4.04 - Ability to manually operate and/or monitor in the control room: Controls and indication for closed cooling water pumps	3.1	
006 Emergency Core Cooling	x											K1.13 - Knowledge of the physical connections and/or cause-effect relationships between the ECCS and the following systems: CSS	3.3	
007 Pressurizer Relief/Quench Tank					x							K5.02 - Knowledge of the operational implications of the following concepts as they apply to PRTS: Method of forming a steam bubble in the PZR	3.1	
008 Component Cooling Water	x											K1.04 - Knowledge of the physical connections and/or cause-effect relationships between the CCWS and the following systems: RCS, in order to determine source(s) of RCS leakage into the CCWS	3.3	
008 Component Cooling Water										x		A4.10 - Ability to manually operate and/or monitor in the control room: Conditions that require the operation of two CCW coolers	3.1	
010 Pressurizer Pressure Control			x									K3.02 - Knowledge of the effect that a loss or malfunction of the PZR PCS will have on the following: RPS	4.0	
012 Reactor Protection						x						K6.11 - Knowledge of the effect of a loss or malfunction of the following will have on the RPS: Trip setpoint calculators	2.9	
013 Engineered Safety Features Actuation		x										K2.01 - Knowledge of bus power supplies to the following: ESFAS/safeguards equipment control	3.6	
022 Containment Cooling								x				A2.01 - Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Fan motor over-current	2.5	
022 Containment Cooling										x		A4.05 - Ability to manually operate and/or monitor in the control room: Containment readings of temperature, pressure, and humidity system	3.8	

026 Containment Spray																			K4.06 - Knowledge of CSS design feature(s) and/or interlock(s) which provide for the following: Iodine scavenging via the CSS	2.8	
039 Main and Reheat Steam																			K4.07 - Knowledge of MRSS design feature(s) and/or interlock(s) which provide for the following: Reactor building isolation	3.4	
039 Main and Reheat Steam																			A3.02 - Ability to monitor automatic operation of the MRSS, including: Isolation of the MRSS	3.1	
059 Main Feedwater																			2.2.44 - Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.	4.2	
061 Auxiliary/Emergency Feedwater																			K5.01 - Knowledge of the operational implications of the following concepts as they apply to the AFW: Relationship between AFW flow and RCS heat transfer	3.6	
061 Auxiliary/Emergency Feedwater																			A2.08 - Ability to (a) predict the impacts of the following malfunctions or operations on the AFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Flow rates expected from various combinations of AFW pump discharge valves	2.7	
062 AC Electrical Distribution																			K1.02 - Knowledge of the physical connections and/or cause-effect relationships between the ac distribution system and the following systems: ED/G	4.1	
062 AC Electrical Distribution																			K3.01 - Knowledge of the effect that a loss or malfunction of the ac distribution system will have on the following: Major system loads	3.5	
063 DC Electrical Distribution																			A1.01 - Ability to predict and/or monitor changes in parameters associated with operating the DC electrical system controls including: Battery capacity as it is affected by discharge rate	2.5	
064 Emergency Diesel Generator																			A1.01 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ED/G system controls including: ED/G lube oil temperature and pressure	3.0	
073 Process Radiation Monitoring																			K3.01 - Knowledge of the effect that a loss or malfunction of the PRM system will have on the following: Radioactive effluent releases	3.6	
076 Service Water																			K2.08 - Knowledge of bus power supplies to the following: ESF-actuated MOVs	3.1	
078 Instrument Air																			A3.01 - Ability to monitor automatic operation of the IAS, including: Air pressure	3.1	
103 Containment																			2.2.37 - Ability to determine operability and/or availability of safety related equipment.	3.6	

010 Pressurizer Pressure Control										x			A2.03 - Ability to (a) predict the impacts of the following malfunctions or operations on the PZR PCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: PORV failures	4.2	
013 Engineered Safety Features Actuation										x			A2.01 - Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS; and (b) based Ability on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: LOCA	4.8	
063 DC Electrical Distribution												x	2.4.20 - Knowledge of the operational implications of EOP warnings, cautions, and notes.	4.3	
073 Process Radiation Monitoring												x	A2.03 - 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: Calibration drift	2.9	
076 Service Water												x	2.4.1 - Knowledge of EOP entry conditions and immediate action steps.	4.8	
K/A Category Point Totals:	3	2	3	3	3	2	2	3	2	3	2	3	2	2	28/5

ES-401		PWR Examination Outline Plant Systems – Tier 2/Group 2 (RO / SRO)										Form ES-401-2		
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
001 Control Rod Drive			x									K3.01 - Knowledge of the effect that a loss or malfunction of the CRDS will have on the following: CVCS	2.9	
011 Pressurizer Level Control		x										K2.02 - Knowledge of bus power supplies to the following: PZR heaters	3.1	
029 Containment Purge										x		A4.04 - Ability to manually operate and/or monitor in the control room: Containment evacuation signal	3.5	
034 Fuel Handling Equipment						x						K6.02 - Knowledge of the effect of a loss or malfunction on the following will have on the Fuel Handling System: Radiation monitoring systems	2.6	
035 Steam Generator					x							K5.01 - Knowledge of operational implications of the following concepts as they apply to the S/GS: Effect of secondary parameters, pressure, and temperature on reactivity	3.4	
041 Steam Dump/Turbine Bypass Control							x					A1.02 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SDS controls including: Steam pressure	3.1	
068 Liquid Radwaste				x								K4.01 - Knowledge of design feature(s) and/or interlock(s) which provide for the following: Safety and environmental precautions for handling hot, acidic, and radioactive liquids	3.4	
071 Waste Gas Disposal									x			A3.03 - Ability to monitor automatic operation of the Waste Gas Disposal System including: Radiation monitoring system alarm and actuating signals	3.6	
075 Circulating Water	x											K1.01 - Knowledge of the physical connections and/or cause-effect relationships between the circulating water system and the following systems: SWS	2.5	
086 Fire Protection								x				A2.02 - Ability to (a) predict the impacts of the following malfunctions or operations on the Fire Protection System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Low FPS header pressure	3.0	
001 Control Rod Drive								x				A2.15 - Ability to (a) predict the impacts of the following malfunction or operations on the CRDS- and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Quadrant power tilt	4.2	

016 Non-nuclear Instrumentation										x			A2.01 - Ability to (a) predict the impacts of the following malfunctions or operations on the NNIS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Detector failure	3.1	
035 Steam Generator												x	2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm.	4.3	
K/A Category Point Totals:	1	1	1	1	1	1	1	1	1	½	1	1	Group Point Total:	0 / 1	10/3

Facility: Three Mile Island		Date of Exam: 09/28/2015					
Category	K/A #	Topic	RO		SRO-Only		
			IR	#	IR	#	
1. Conduct of Operations	2.1.19	Ability to use plant computers to evaluate system or component status.	3				
	2.1.25	Ability to interpret reference materials, such as graphs, curves, tables, etc.	3				
	2.1.5	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.			3		
	2.1.35	Knowledge of the fuel-handling responsibilities of SROs.			3		
	2.1.						
	2.1.						
	Subtotal				2		2
2. Equipment Control	2.2.13	Knowledge of tagging and clearance procedures.	4				
	2.2.38	Knowledge of conditions and limitations in the facility license.	3				
	2.2.42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3				
	2.2.21	Knowledge of pre- and post-maintenance operability requirements.			4		
	2.2.25	Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.			4		
	2.2.				3		2
	Subtotal						
3. Radiation Control	2.3.13	Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	3				
	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2				
	2.3.6	Ability to approve release permits.			3		
	2.3.						
	2.3.						
	2.3.						
	Subtotal				2		1
4. Emergency Procedures /	2.4.4	Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.	4				

Plan	2.4.5	Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.	3			
	2.4.47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	4			
	2.4.18	Knowledge of the specific bases for EOPs.			4	
	2.4.25	Knowledge of fire protection procedures.			3	
	2.4.					
	Subtotal				3	
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
1 / 1	054 / AA1.03	The subject K/A is not relevant at the subject facility. Replaced with 054 / AA1.01
2 / 1	008 / A4.11	The subject K/A is not relevant at the subject facility. Replaced with 008 / A4.10
2 / 1	059 / K3.03	Topic overlaps with the Audit Written Exam. Replaced with 062 / K3.01
2 / 1	103 / A1.01	Topic overlaps with the Audit Written Exam. Replaced with 003 / K5.02
2 / 1	078 / 2.2.44	Generic K/A oversampled. 078 / 2.2.44 overlaps with 059 / 2.2.44. Replaced with 022 / A4.05
2 / 1	013 / 2.1.27	Original K/A is LOD 1. Replaced with 103 / 2.2.37
2 / 2	014 / 2.1.27	Original K/A is LOD 1. Replaced with 086 / A2.02
2 / 2	015 / K1.04	The subject K/A is not relevant at the subject facility. Replaced with 075 / K1.01
3 / 1	2.1.30	The subject K/A is not generic enough for Tier level at the subject facility. Replaced with 2.1.25
3 / 3	2.3.11	Topic overlaps with the Audit Written Exam. Replaced with 2.3.13
1 / 1 SRO	009 / 2.4.45	Generic K/A oversampled. 009 / 2.4.45 overlaps with 035 / 2.4.45. Replaced with 009 / 2.4.41
1 / 1 SRO	E05 / 2.2.36	The subject K/A is not relevant to the topic at the subject facility. Replaced with 057 / 2.4.30
1 / 2 SRO	051 / 2.4.1	Original K/A is RO LOK. Replaced with E08 / 2.4.18
1 / 2 SRO	060 / 2.4.47	Topic oversampled. 060 / 2.4.47 overlaps with RO Generic K/A 2.4.47. Replaced with 024 / 2.4.6
2 / 1 SRO	006 / A2.04	Original K/A is RO LOK. Replaced with 010 / A2.03
2 / 2 SRO	075 / A2.03	Topic overlaps with the Audit Written Exam / NRC Operational. Replaced with 001 / A2.15
3 / 2 SRO	2.2.1	Original K/A is RO LOK. Replaced with 2.2.21
3 / 3 SRO	2.3.15	Topic oversampled. 2.3.15 overlaps with RO Generic K/A 2.3.15. Replaced with 2.3.6

Facility: <u>Three Mile Island</u>		Date of Examination: <u>09/28/2015</u>
Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: <u>2015-301</u>
Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M/R	Verify Watchstanding Requirements – Work-Hour Rules 2.1.5 (2.9): Ability to use procedures related to shift staffing, such as minimum crew compliment, overtime limitations, etc.
Conduct of Operations	M/R	Given a Dropped Rod at Power, Calculate SDM 2.1.25 (3.9): Ability to interpret station reference materials such as graphs, curves, tables, etc.
Equipment Control	N/R	Given Intermediate Closed Cooling Water System Electrical and Mechanical Print Drawings, Identify the Status of Associated Containment Isolation Valves 2.2.41 (3.5): Ability to obtain and interpret station electrical and mechanical drawings.
Radiation Control		Category Not Selected for RO Applicants.
Emergency Plan	M/S	Perform State and Local Event Notification 2.4.43 (3.2): Knowledge of Emergency Communications Systems and Techniques.
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics (which would require all five items).		
* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

Facility: <u>Three Mile Island</u>		Date of Examination: <u>09/28/2015</u>
Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/>		Operating Test Number: <u>2015-301</u>
Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M/R	Maintain Minimum Shift Staffing – Control Overtime 2.1.5 (3.9): Ability to use procedures related to shift staffing, such as minimum crew compliment, overtime limitations, etc.
Conduct of Operations	M/R	Given a Dropped Rod at Power, Review Submitted SDM for Approval 2.1.25 (4.2): Ability to interpret station reference materials such as graphs, curves, tables, etc.
Equipment Control	N/R	Given Intermediate Closed Cooling Water System Electrical and Mechanical Print Drawings, Identify the Status of Associated Containment Isolation Valves with Tech Spec LCO 2.2.41 (3.9): Ability to obtain and interpret station electrical and mechanical drawings.
Radiation Control	M/R	Review RB Entry Survey Log 2.3.13 (3.8): Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.
Emergency Plan	M/S	Determine the Emergency Action Level (EAL) and Make a Protective Action Recommendation (PAR) IAW the Facility Emergency Plan 2.4.44 (4.4): Knowledge of Emergency Plan Protective Action Recommendations.
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics (which would require all five items).		
* Type Codes & Criteria:		
(C)ontrol room, (S)imulator, or Class(R)oom		
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)		
(N)ew or (M)odified from bank (≥ 1)		
(P)revious 2 exams (≤ 1 ; randomly selected)		

Facility: <u>Three Mile Island</u>		Date of Examination: <u>09/28/2015</u>	
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>2015-301</u>	
Control Room Systems: *8 for RO; 7 for SRO-I; 2 or 3 for SRO-U			
System / JPM Title	Type Code*	Safety Function	
a. Respond to an Inoperable/Stuck Control Rod (005) AA1.01	M/S	1	
b. Respond to a Loss of Pressurizer Level Control with Failures (011) A2.03	D/A/S	2	
c. Restore Seal Injection with a Loss of ICCW (003) K6.02	P/S/A	4P	
d. Respond to an OTSG Overfeed (035) A2.04	N/A/S	4S	
e. Initiate RB Spray (026) A2.03	D/L/S/A/EN	5	
f. Lower CFT Level and Pressure from the Control Room (006) A4.02	N/S	3	
g. Startup Reactor Protection System Channel (012) A4.02	D/S	7	
h. Respond to Loss of SCCW (026) AA1.05	D/A/S	8	
In-Plant Systems * (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)			
i. Initiate Emergency Boration IAW EOP-020 (004) G2.1.30	D/E/L/R	1	
j. Respond to a Loss of Instrument Air (078) A3.01	D/E	8	
k. EFW from Fire Service using FS-P-15 (061) A2.04	D/E/L	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; 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			

Facility: <u>Three Mile Island</u>		Date of Examination: <u>09/28/2015</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>2015-301</u>
Control Room Systems: *8 for RO; 7 for SRO-I; 2 or 3 for SRO-U		
System / JPM Title	Type Code*	Safety Function
a. Respond to an Inoperable/Stuck Control Rod (005) AA1.01	M/S	1
b. Respond to a Loss of Pressurizer Level Control with Failures (011) A2.03	D/A/S	2
c. Restore Seal Injection with a Loss of ICCW (003) K6.02	P/S/A	4P
d. Respond to an OTSG Overfeed (035) A2.04	N/A/S	4S
e. Initiate RB Spray (026) A2.03	D/L/S/A/EN	5
f. Lower CFT Level and Pressure from the Control Room (006) A4.02	N/S	3
g.		
h. Respond to Loss of SCCW (026) AA1.05	D/A/S	8
In-Plant Systems * (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Initiate Emergency Boration IAW EOP-020 (004) G2.1.30	D/E/L/R	1
j. Respond to a Loss of Instrument Air (078) A3.01	D/E	8
k. EFW from Fire Service using FS-P-15 (061) A2.04	D/E/L	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; 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		

Facility: Three Mile Island
 Exam Level: RO SRO-I SRO-U

Date of Examination: 09/28/2015
 Operating Test No.: 2015-301

Control Room Systems: *8 for RO; 7 for SRO-I; 2 or 3 for SRO-U

System / JPM Title	Type Code*	Safety Function
a.		
b.		
c.		
d. Respond to an OTSG Overfeed (035) A2.04	N/A/S	4S
e. Initiate RB Spray (026) A2.03	D/L/S/A/EN	5
f. Lower CFT Level and Pressure from the Control Room (006) A4.02	N/S	3
g.		
h.		

In-Plant Systems * (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i. Initiate Emergency Boration IAW EOP-020 (004) G2.1.30	D/E/L/R	1
j. Respond to a Loss of Instrument Air (078) A3.01	D/E	8
k.		

* 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; 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	

Facility:	Three Mile Island	Scenario No.:	1	Op Test No.:	<u>2015-301</u>
Examiners:	_____	Operators:	_____		
	_____		_____		
Initial Conditions:	<ul style="list-style-type: none"> • (Temporary IC-175) • 85% Power, MOL, reduced from 100% 1 hour ago, due to PJM instructions. • BS-P-1A is OOS for maintenance, expected to return to service in 6 hours. • Crane work is occurring on the West side of the Plant to stage new piping 				
Turnover:	Maintain 85% Power Operations				
Critical Tasks:	<ul style="list-style-type: none"> • Shutdown Reactor - ATWS (CT-24) • Restore Feed to a Dry OTSG (CT-26) 				
Event No.	Malf. No.	Event Type*	Event Description		
1	RM0323	TS CRS	Reactor Building Hi Range Radiation Monitor, RM-G-23, Failure		
2	ZAIRC1LIC	C CRS C URO	MU-V-17 Fails Closed in Auto, entry into OP-TM-211-472 (URO: Controls Pressurizer Level with MU-V-17 in Manual)		
3	ED09D	TS CRS C ARO	Loss of D Inverter, Loss of VBD, entry into OP-TM-AOP-018 (ARO: Place Rad Monitors Interlock switches to Defeat, Restore Control Building Ventilation)		
4	02A5S81	C CRS C ARO	Low Makeup Tank Pressure, entry into OP-TM-MAP-D0303 (ARO: Raise Makeup Tank pressure)		
5	IC23	I CRS I URO I ARO	SG/RX Demand Station fails to 0 Volts, Entry into OP-TM-AOP-070 (URO/ARO: ICS station to Manual, Stabilize Power)		
6	MU29	C CRS R URO C ARO	RCS leak through the Letdown Line, entry into OP-TM-AOP-050 (URO: Lowers power in Manual ARO: Isolate the Letdown Line)		
7	FW15B RD28 RD32	M CRS M URO M ARO	"B" Main Feed Pump trips, "A" Main Feed Pump Runs to 0 rpm, ATWS, Lack of Primary to Secondary Heat Transfer.		
8	FW19	C CRS C ARO	EFW Control Valves fail to operate, EF-V-52A-D Closed (ARO: Establish PSHT via Condensate Booster Pump flow)		
9 (if required)	MU35B	C CRS C URO	MU-P-1A/C will not start, MU-P-1B trips. (URO: Establish PORV control for Heat Transfer)		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Facility:	Three Mile Island	Scenario No.:	2	Op Test No.:	2015-301
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions:	<ul style="list-style-type: none"> • (Temporary IC-176) • 100% Power, MOL • BS-P-1A is OOS for maintenance, expected to return to service in 6 hours. • Crane work is occurring on the West side of the Plant to stage new piping 				
Turnover:	Maintain 100% Power Operations				
Critical Tasks:	<ul style="list-style-type: none"> • Electrical Power Alignment (CT-8) • Turbine Trip (CT-18) • Protect against RCP Seal LOCA (CT-*) 				
Event No.	Malf. No.	Event Type*	Event Description		
1	NI27A	I CRS I URO I ARO	Pressurizer Pressure Instrument Fails High, entry into OP-TM-MAP-G0106, OP-TM-MAP-G0107 (URO: Blocks PORV, closes Spray Valve, Pressurizer Heater Control in Manual, ARO: "A" RPS to Manual Bypass)		
2	IC12	C CRS C URO C ARO	Total RCS Flow IN Fails to Zero Volts, entry into OP-TM-AOP-070 and 1102-4. (URO/ARO: ICS station to Manual, Stabilize Power)		
3	03A3S09 - ZDI1SAE 2(1)	TS CRS C URO	Loss of 1E 4KV Bus, Entry into OP-TM-AOP-014 (URO: Manual control of Makeup valves)		
4	TU01D	N CRS R URO N ARO	High Vibrations on Main Turbine, entry into OP-TM-MAP-K0201 and 1102-4 (URO/ARO: Power reduction with ICS in Manual)		
5	EG04A EG04B	I CRS I URO	Loss of Stator Coolant Pumps, Main Turbine fails to automatically trip (URO: Trip Reactor)		
6	HVB-1-1 HVB-2-1 A-1-4	TS CRS C ARO	Fire in EG-Y-1B Room, entry into OP-TM-AOP-001 (ARO: Secure EG-Y-1B)		
7	ED01	M CRS M URO M ARO	Loss of Offsite Power, entry into OP-TM-AOP-020.		
8	EG01A	C CRS C URO	"A" EDG fails to start, SBO start required. (URO)		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Facility:	Three Mile Island	Scenario No.:	3	Op Test No.:	<u>2015-301</u>
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions:	<ul style="list-style-type: none"> • (Temporary IC-177) • 85% Power, MOL, reduced from 100% 1 hour ago, due to PJM instructions. • BS-P-1A is OOS for maintenance, expected to return to service in 6 hours. • Crane work is occurring on the West side of the Plant to stage new piping 				
Turnover:	Maintain 85% Reactor Power				
Critical Tasks:	<ul style="list-style-type: none"> • Control HPI (CT-5) • Establish FW Flow and Feed SG(s) (CT-10) • Natural Circulation RCS Flow (CT-12) 				
Event No.	Malf. No.	Event Type*	Event Description		
1	DHR32	TS CRS	BWST level lowers, entry into OP-TM-MAP-E0304		
2	03A4S01 - ZDIPB1R CB ON	TS CRS I URO I ARO	Inadvertent ES Actuation, "B" Train (TS), entry into OP-TM-AOP-046 (URO: Defeats signal, ARO: Opens MU-V-2A/B)		
3	RC08B IC51	I CRS I URO I ARO	Tc Instrument Fails High, SASS Fails to Actuate, entry into OP-TM-AOP-070 (URO: Manual control of Control Rods, ARO: Manual control of Feedwater)		
4	MU19A	N CRS R URO N ARO	RC-P-1A #1 Seal Leak, leak at 6.5 gpm, Entry into OP-TM-AOP-040 (URO/ARO: Power reduction in manual)		
5	MU19A	C CRS C URO C ARO	RC-P-1A #1 Seal Failure, leak at 10 gpm, Entry into OP-TM-AOP-040 (URO: Secure RC-P-1A, ARO: Reratio MFW)		
6	MS19A	C CRS C ARO	Isolable Steam Leak in Turbine Bldg, entry into OP-TM-AOP-051. (ARO: Isolate Steam Leak)		
7	TH06	M CRS M URO M ARO	RCS LOCA, entry into OP-TM-AOP-050, OP-TM-EOP-001.		
8	CC06A	C CRS C URO	NSCCW Rupture in RC-P-1A Motor Air Cooler, Loss of NSCCW, entry into OP-TM-AOP-031 (URO: Trip RCP's)		
9	ICR02 ICR04	C CRS C ARO	HSPS fails to feed OTSG's to 50% (ARO: Feed OTSG's to >50% in manual)		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					