ES-401 **BWR RO Examination Outline** **Form ES-401-2 (R8, S1)**

Facility: NMPC U2 **Date of Exam: 07/29/02** **Exam Level: RO**

Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	3	4	1				4	0			1	13
	2	4	2	5				4	2			2	19
	3	1	0	2				1	0			0	4
	Tier Totals	8	6	8				9	2			3	36
2. Plant Systems	1	2	2	2	2	2	4	3	3	3	4	1	28
	2	2	1	2	2	2	1	2	2	2	2	1	19
	3	0	0	0	2	1	0	0	1	0	0	0	4
	Tier Totals	4	3	4	6	5	5	5	6	5	6	2	51
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		13
					3		3		3		4		

Final Document. Represents the "as administered" written exam on August 2, 2002.

Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).

2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final exam must total 100 points.

3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.

4. Systems/evolutions within each group are identified on the associated outline.

5. The shaded areas are not applicable to the category/tier.

6.* The generic 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.

7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)									
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295005 Main Turbine Generator Trip / 3		X					AK2.04 Knowledge of the interrelations between Main Turbine Generator Trip and the following: Main generator protection (1)	3.3	1
295006 SCRAM / 1		X					AK2.06 Knowledge of the interrelations between SCRAM and the following: Reactor power (2)	4.2	1
295009 Low Reactor Water Level / 2				X			AA1.01 Ability to operate and/or monitor the following as they apply to Low Reactor Water Level: Reactor feedwater (3)	3.9	1
295014 Inadvertent Reactivity Addition / 1	X			X			AK1.05 Knowledge of the operational applications of the following concepts as they apply to the Inadvertent Reactivity Addition: Fuel thermal limits (4) AA1.07 Ability to operate and/or monitor the following as they apply to Inadvertent Reactivity Addition: Cold water injection (5)	3.7 4.0	1 1
295015 Incomplete SCRAM / 1		X					AK2.10 Knowledge of the interrelations between Incomplete SCRAM and the following: SPDS/ERIS/CRIDS/GDS (6)	2.8	1
295024 High Drywell Pressure / 5				X			EA1.19 Ability to operate and/or monitor the following as they apply to High Drywell Pressure: Containment atmosphere control (7)	3.3	1
295025 High Reactor Pressure / 3		X		X			EK2.04 Knowledge of the interrelations between High Reactor Pressure and the following: ARI/RPT/ATWS (8) EA1.08 Ability to operate and/or monitor the following as they apply to High Reactor Pressure: RRCS (9)	3.9 3.3	1 1
295031 Reactor Low Water Level / 2	X						EK1.03 Knowledge of the operational applications of the following concepts as they apply to the Reactor Low Water Level: Water level effects on reactor power (10)	3.7	1
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1	X						EK1.06 Knowledge of the operational applications of the following concepts as they apply to the SCRAM Condition Present and Power Above APRM Downscale or Unknown: Cooldown effects on reactor power (11)	4.0	1
500000 High Containment Hydrogen Conc. / 5			X			X	EK3.05 Knowledge of the reasons for the following responses as they apply to High Containment Hydrogen Conc.: Operation of wetwell (suppression pool) sprays (12) RO Only 2.1.32 Ability to explain and apply system limits and precautions (13)	2.9 3.4	1 1
K/A Category Totals:	3	4	1	4	0	1	Group Point Total:		13

Final Document. Represents the "as administered" written exam on August 2, 2002.

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4					X		AA2.05 Ability to determine and interpret the following as they apply to Partial or Complete Loss of Forced Core Flow Circulation:Jet pump operability (14) RO Only	3.1	1
295002 Loss of Main Condenser Vacuum / 3			X			X	AK3.05 Knowledge of the reasons for the following responses as they apply to Loss of Main Condenser Vacuum: Main steam isolation valve (15) 2.4.4 Ability to recognize abnormal indications for system operating parameters which entry-level conditions for emergency and abnormal operating procedures (16)	3.4 4.0	1 1
295003 Partial or Complete Loss of AC Pwr / 6	X						AK1.03 Knowledge of the operational applications of the following concepts as they apply to the Partial or Complete Loss of AC Pwr: Under voltage/degraded voltage effects on electrical loads (17)	2.9	1
295004 Partial or Complete Loss of DC Pwr / 6	X						AK1.02 Knowledge of the operational applications of the following concepts as they apply to the Partial or Complete Loss of DC Pwr: Redundant D.C. power supplies (18)	3.2	1
295005 Main Turbine Generator Trip				X			AA1.05 Ability to operate and/or monitor the following as they apply to Main Turbine Generator Trip: Reactor/turbine pressure regulating system (19)	3.6	1
295008 High Reactor Water Level / 2				X X			AA1.06 Ability to operate and/or monitor the following as they apply to High Reactor Water Level: HPCS (20) AA1.07 Ability to operate and/or monitor the following as they apply to High Reactor Water Level: Main turbine (21) RO Only	2.8 3.4	1 1
295013 High Suppression Pool Temp. / 5		X					AK2.01 Knowledge of the interrelations between High Suppression Pool Temp. and the following: Suppression pool cooling (22)	3.6	1
295016 Control Room Abandonment / 7			X				AK3.02 Knowledge of the reasons for the following responses as they apply to Control Room Abandonment: Turbine trip (23)	3.7	1
295017 High Off-site Release Rate / 9			X				AK3.02 Knowledge of the reasons for the following responses as they apply to High Off-site Release Rate: Plant Ventilation Systems (24)	3.3	1
295019 Part. or Comp. Loss of Inst. Air / 8			X				AK3.02 Knowledge of the reasons for the following responses as they apply to Part. or Comp. Loss of Inst. Air: Standby air compressor operation (25)	3.5	1
295020 Inadvertent Cont. Isolation / 5 & 7						X	2.1.23 Ability to perform specific system and integrated plant procedures during different modes of plant operation (26)	3.9	1
295022 Loss of CRD Pumps / 1	X						AK1.01 Knowledge of the operational applications of the following concepts as they apply to the Loss of CRD Pumps: Reactor pressure vs. rod insertion capability (27)	3.3	1
295026 High Suppression Pool Water Temp. / 5	X						EK1.01 Knowledge of the operational applications of the following concepts as they apply to the High Suppression Pool Water Temp: Pump NPSH (28)	3.0	1
295029 High Suppression Pool Water Level / 5				X			EA1.03 Ability to operate and/or monitor the following as they apply to High Suppression Pool Water Level: RHR/LPCI (29)	2.9	1
295030 Low Suppression Pool Water Level / 5			X		X		EK3.03 Knowledge of the reasons for the following responses as they apply to Low Suppression Pool Water Level: RCIC operation (30) EA2.02 Ability to determine and interpret the following as they apply to Low Suppression Pool Water Level: Suppression pool temperature (31)	3.6 3.9	1 1
295033 High Sec. Cont. Area Rad. Levels / 9		X					EK2.01 Knowledge of the interrelations between High Sec. Cont. Area Rad. Levels and the following: Area radiation monitoring system (32) RO Only	3.8	1
K/A Category Point Totals:	4	2	5	4	2	2	Group Point Total:		19

Final Document. Represents the "as administered" written exam on August 2, 2002.

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)									
Emergency and Abnormal Plant Evolutions - Tier 1/Group 3									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295021 Loss of Shutdown Cooling			X				AK3.01 Knowledge of the reasons for the following responses as they apply to **Loss of Shutdown Cooling:** Raising reactor water level (33) RO Only	3.3	1
295023 Refueling Accidents / 8	X						AK1.03 Knowledge of the operational applications of the following concepts as they apply to the **Refueling Accidents:** Inadvertent criticality (34) RO Only	3.7	1
295035 Secondary Containment High Differential Pressure / 5			X				EK3.02 Knowledge of the reasons for the following responses as they apply to **Secondary Containment High Differential Pressure** Secondary containment ventilation response (35)	3.3	1
295036 Secondary Containment High Sump/Area Water Level / 5				X			EA1.03 Ability to operate and/or monitor the following as they apply to **Secondary Containment High Sump/Area Water Level:** Radwaste (36) RO Only	2.8	1
K/A Category Point Totals:	1	0	2	1	0	0	Group Point Total:		4

Final Document. Represents the "as administered" written exam on August 2, 2002.

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)

Plant Systems - Tier 2/Group 1

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)	Imp.	Points
201001 CRD Hydraulic								X				A2.10 Ability to (a) predict the impacts of the following on the CRD Hydraulic and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Low HCU accumulator pressure/high level (37) RO Only	3.5	1
201002 RMCS									X			A3.01 Ability to monitor automatic operations of the RMCS including: Control rod block actuation (39) RO Only	3.2	1
202002 Recirculation Flow Control			X	X								K3.06 Knowledge of the effect that a loss or malfunction of the Recirculation Flow Control will have on the following: Recirculation flow control valve position (40)	3.7	1
												K4.09 Knowledge of Recirculation Flow Control design feature(s) and or interlock(s) which provide for the following: Minimum and maximum flow control valve position setpoints (41)	3.3	1
203000 RHR/LPCI: Injection Mode			X								X	K3.03 Knowledge of the effect that a loss or malfunction of the RHR/LPCI: Injection Mode will have on the following: Automatic depressurization logic (42)	4.2	1
												2.1.32 Ability to explain and apply system limits and precautions (43) RO Only	3.4	1
209001 LPCS									X			A3.04 Ability to monitor automatic operations of the LPCS including: System flow (44)	3.7	1
209002 HPCS	X									X		K1.02 Knowledge of the physical connections and/or cause-effect relationships between HPCS and the following: Suppression pool (45)	3.5	1
												A4.07 Ability to manually operate and/or monitor in the control room: Line fill pump (46)	2.8	1
211000 SLC	X											K1.05 Knowledge of the physical connections and/or cause-effect relationships between SLC and the following: RWCU (47)	3.4	1
212000 RPS										X		A4.15 Ability to manually operate and/or monitor in the control room: Recirculation pump trip/EOC RPT (48) RO Only	3.9	1
215003 IRM				X								K4.02 Knowledge of XIRM design feature(s) and or interlock(s) which provide for the following: Reactor SCRAM signals (49)	4.0	1
215004 SRM										X		A4.04 Ability to manually operate and/or monitor in the control room: SRM drive control switches (50) RO Only	3.2	1
215005 APRM / LPRM						X						K6.07 Knowledge of effect that a loss or malfunction of the following will have on APRM / LPRM System: Flow Converter/Comparator(38)	3.2	1
217000 RCIC		X								X		K2.04 Knowledge of electrical power supplies to the following: Gland seal compressor (vacuum pump) (52)	2.6	1
												A4.08 Ability to manually operate and/or monitor in the control room: RCIC system flow (51)	3.7	1

Final Document. Represents the "as administered" written exam on August 2, 2002.

218000 ADS					X				X			K5.01 Knowledge of the operational implications of the following concepts as they apply to the ADS: ADS logic operation (53)	3.8	1
												A3.03 Ability to monitor automatic operations of the ADS including: ADS valve acoustical monitor noise (54)	3.7	1
223001 Primary CTMT and Auxiliaries		X			X							K2.09 Knowledge of electrical power supplies to the following: Drywell cooling fans (55)	2.7	1
												K5.01 Knowledge of the operational implications of the following concepts as they apply to the Primary CTMT and Auxiliaries: Vacuum breaker/relief operation (56)	3.1	1
223002 PCIS/Nuclear Steam Supply Shutoff							X					A1.02 Ability to predict and/or monitor changes in parameters associated with operating the PCIS/Nuclear Steam Supply Shutoff controls including: Valve closures (57)	3.7	1
239002 SRVs								X				A2.03 Ability to (a) predict the impacts of the following on the SRVs and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Stuck open SRV (58)	4.1	1
241000 Reactor/Turbine Pressure Regulator							X					A1.13 Ability to predict and/or monitor changes in parameters associated with operating the Reactor/Turbine Pressure Regulator controls including: Main turbine speed (59)	2.7	1
259001 Reactor Feedwater						X	X					A1.01 Ability to predict and/or monitor changes in parameters associated with operating the Reactor Feedwater System controls including: Feedwater flow/pressure (60)	3.3	1
												K6.05 Knowledge of the effect that a loss or malfunction of the following will have on the Reactor Feedwater: Component cooling water (61)	2.7	1
259002 Reactor Water Level Control						X		X				K6.03 Knowledge of the effect that a loss or malfunction of the following will have on the Reactor Water Level Control: Main steam flow input (62)	3.1	1
												A2.06 Ability to (a) predict the impacts of the following on the Reactor Water Level Control and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of controller signal output (63)	3.3	1
264000 EDGs						X						K6.09 Knowledge of the effect that a loss or malfunction of the following will have on the EDGs: D.C power (64)	3.3	1
K/A Category Point Totals:	2	2	2	2	2	4	3	3	3	4	1	Group Point Total:		28

Final Document. Represents the "as administered" written exam on August 2, 2002.

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1) Plant Systems - Tier 2/Group 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)	Imp.	Points
201003 Control Rod and Drive Mechanism					X				X			K5.03 Knowledge of the operational implications of the following concepts as they apply to the Control Rod and Drive Mechanism: Reactor power control (65) A3.01 Ability to monitor automatic operations of the Control Rod and Drive Mechanism including: Control rod position (66) ROOnly	3.3 3.7	1 1
202001 Recirculation							X					A1.10 Ability to predict and/or monitor changes in parameters associated with operating the Recirculation controls including: Recirculation seal purge flows (67) RO Only	2.6	1
204000 RWCU										X		A4.06 Ability to manually operate and/or monitor in the control room: System flow (68) RO Only	3.0	1
205000 Shutdown Cooling	X											K1.01 Knowledge of the physical connections and/or cause-effect relationships between Shutdown Cooling and the following: Reactor pressure (69) RO Only	3.6	1
214000 RPIS				X						X		K4.01 Knowledge of RPISdesign feature(s) and or interlock(s) which provide for the following: Reed switch locations (70) RO Only A4.03 Ability to manually operate and/or monitor in the control room: Control rod drive temperature (71)	3.0 2.8	1 1
215002 RBM								X			X	A2.01 Ability to (a) predict the impacts of the following on the RBM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Withdrawal of control rod in high power region of core (72) 2.4.50 Ability to verify system alarm setpoint and operate controls identified in the alarm response manual (73) RO Only	3.3 3.3	1 1
256000 Reactor Condensate								X				A2.16 Ability to (a) predict the impacts of the following on the Reactor Condensate and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High demineralizer differential pressure (74) RO Only	2.8	1
262001 AC Electrical Distribution			X									K3.01 Knowledge of the effect that a loss or malfunction of the AC Electrical Distribution will have on the following: Major system loads (75)	3.5	1
262002 UPS (AC/DC)									X			A3.01 Ability to monitor automatic operations of the UPS (AC/DC) including: Transfer from preferred to alternate source (76) RO Only	2.8	1

Final Document. Represents the "as administered" written exam on August 2, 2002.

263000 DC Electrical Distribution		X					X					K2.01 Knowledge of electrical power supplies to the following: Major D.C. loads (77) A1.01 Ability to predict and/or monitor changes in parameters associated with operating the DC Electrical Distribution controls including: Battery charging/discharging rate (78)	3.1 2.5	1 1
271000 Offgas						X						K6.09 Knowledge of the effect that a loss or malfunction of the following will have on the Offgas: Fuel cladding integrity (79) RO Only	3.4	1
286000 Fire Protection			X									K3.01 Knowledge of the effect that a loss or malfunction of the Fire Protection will have on the following: The ability to detect fires (80)	3.2	1
290003 Control Room HVAC					X							K5.01 Knowledge of the operational implications of the following concepts as they apply to Control Room HVAC: Airborne contamination (e.g. radiological, toxic gas, smoke) control (81) RO Only	3.2	1
300000 Instrument Air				X								K4.01 Knowledge of Instrument Air design feature(s) and or interlock(s) which provide for the following: Manual/automatic transfers of control (82) RO Only	2.8	1
400000 Component Cooling Water	X											K1.02 Knowledge of the physical connections and/or cause-effect relationships between Component Cooling Water and the following: Loads cooled by CCWS (83)	3.2	1
K/A Category Point Totals:	2	1	2	2	2	1	2	2	2	2	1	Group Point Total:		19

Final Document. Represents the "as administered" written exam on August 2, 2002.

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)

Plant Systems - Tier 2/Group 3

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)	Imp.	Points
233000 Fuel Pool Cooling and Cleanup				X								K4.06 Knowledge of Fuel Pool Cooling and Cleanup design feature(s) and or interlock(s) which provide for the following: Maintenance of adequate pool level (84) RO Only	2.9	1
234000 Fuel Handling Equipment					X							K5.05 Knowledge of the operational implications of the following concepts as they apply to the Fuel Handling Equipment: Fuel orientation (85)	3.0	1
288000 Plant Ventilation				X								K4.03 Knowledge of Plant Ventilation Systems design feature(s) and/or interlocks which proide for the following: Automatic starting and stopping of fans (86)	2.8	1
290002 Reactor Vessel Internals								X				A2.02 Ability to (a) predict the impacts of the following on the Reactor Vessel Internals and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Overpressurization transient (87)	3.6	1
K/A Category Point Totals:	0	0	0	2	1	0	0	1	0	0	0	Group Point Total:		4

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points
Tier 2 Group 2 290003 K5.01	Tier 2 Group 2 290003 K6.04	An appropriate question can not be developed. HVAC Fire system is manual valves.	1
Tier 3 Common Generic 2.2.11	Tier 3 Common Generic 2.2.34	An appropriate question can not be developed. Generic Fundamentals level of knowledge.	1
Tier 2 Group 1 259001 A1.01	Tier 2 Group 1 259001 K5.02	An appropriate question can not be developed. Generic Fundamentals level of knowledge.	1
Tier 2 Group 1 217000 A4.08	Tier 2 Group 1 215005 K4.08	An appropriate question can not be developed. Replaced with RCIC operation question because of higher operational significance.	1
Plant-Specific Priority Total: (limit 10)			4

Final Document. Represents the "as administered" written exam on August 2, 2002.

ES-401 Generic Knowledge and Abilities Outline (Tier 3) Form ES-401-5 (R8, S1)

Facility: NMPC U2	Date of Exam: 07/29/02	Exam Level: RO		
Category	**K/A #**	**Topic**	**Imp.**	**Points**
Conduct of Operations	2.1.10	Knowledge of conditions and limitations in the facility license (88) RO Only	2.7	1
	2.1.14	Knowledge of system status criteria which require the notification of plant personnel (89)	2.5	1
	2.1.31	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup (90)	4.2	1
	Total			3
Equipment Control	2.2.12	Knowledge of surveillance procedures (91)	3.0	1
	2.2.28	Knowledge of new and spent fuel movement procedures (92) RO Only	2.6	1
	2.2.11	Knowledge of the process for controlling temporary changes (93)	2.5	1
	Total			3
Radiation Control	2.3.2	Knowledge of facility ALARA program (94) RO Only	2.5	1
	2.3.9	Knowledge of the process for performing a containment purge (95)	2.5	1
	2.3.11	Ability to control radiation releases (96)	2.7	1
	Total			3
Emergency Procedures/ Plan	2.4.18	Knowledge of the specific bases for EOPs (97)	2.7	1
	2.4.27	Knowledge of fire in plant procedure (98)	3.0	1
	2.4.32	Knowledge of operator response to loss of all annunciators (99)	3.3	1
	2.4.35	Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications (100)	3.3	1
	Total			4
Tier 3 Point Total (RO)				13

Final Document. Represents the "as administered" written exam on August 2, 2002.

ES-401 **Record of Rejected K/As** **Form ES-401-10 (R8, S1)**

Tier / Group	Randomly Selected K/A	Reason for Rejection
Various	Line out of K/As in Attached NUREG 1123	K/As not applicable to Nine Mile Point Unit 2 design per ES-401 D.1.b
TIER 1 and TIER 2	GENERIC K/As	Non-system GENERIC K/A statements suppressed per NRC Suppression Guidance Letter, 'Clarification of Guidance Regarding the Elimination of Inappropriate Knowledge and Abilities (K/A) on Written Operator Licensing Examinations' and ES-401 D.1.b
Various	<2.5 Importance Rating	All K/As with Importance rating less than 2.5 will not be selected during random generation per ES-401 D.1.b
TIER 2/GROUP 2 RO ONLY	214000 K4.02	Randomly reselected K4.01, to avoid double jeopardy with A4.03. K4.02 is similar to A4.03.
TIER 2/GROUP 2 RO ONLY	215002 2.4.49	Randomly reselected 2.4.50, 2.4.49 is not applicable, due to no Immediate Operator Actions for RBM at NMPC U2
TIER 2/GROUP 3 RO ONLY	233000 K2.02	Randomly reselected K4.06, K2.02 is not appliable, Spent Fuel Pool Cooling System contains its' own system pumps.
TIER 2/GROUP 1 SRO/RO	211000 K1.07	Randomly reselected K1.05, K1.07 is not applicable to Nine Mile Point Unit 2 design. SLS system injects through the HPCS sparger inside the downcomer.
TIER 2/GROUP 1 SRO/RO	239002 A2.04	Randomly reselected A2.03, due to over-sampling of ADS logic when compared with sampling in 218000 and 203000.
		The following are changes made to written exam outlines after initial outline submittal. These are also identified on Form 401-1 and 401-2 Written Outlines.
TIER 2/GROUP 2 RO ONLY	290003 K6.04	290003 K5.01 An appropriate question can not be developed. HVAC Fire system is manual valves.
TIER 3 RO/SRO	Common Generic 2.2.34	Generic 2.2.11 An appropriate question can not be developed. Generic Fundamentals level of knowledge.
TIER 2/GROUP 1 (RO) TIER 2/GROUP 2 (SRO)	259001 K5.02	259001 A1.01 An appropriate question can not be developed. Generic Fundamentals level of knowledge.
RO TIER 1/ Group 1	500000 EA1.05	500000 EK3.05 RO selected, unable to write question to original K/A for RO position

Final Document. Represents the "as administered" written exam on August 2, 2002.

SRO/RO TIER 1/ Group 1	500000 2.1.28	**500000 2.1.32 selected,** unable to write question to original K/A
SRO/RO TIER 1/ Group 2	295022 AK2.02	**295002 2.4.4, selected** SRO original K/A overlap with RO outline when selected as a common
SRO/RO TIER 1/ Group 2	295029 EK1.01	**295005 AA1.05** SRO made into common reselected to K/A applicable to both RO and SRO
RO TIER 1/ Group 3	295036 EK2.02 RO	**295021 AK3.01** ROoriginal K/A not applicable at NMPC 2 reselected to new K/A
SRO/RO TIER 2/ Group 2	215002 A2.04	**215002 A2.01** better match to question
RO TIER 1/ Group 2 SRO TIER 1/ Group 2	295030 EA2.01	**295030 EA2.02**better match to question
SRO/RO TIER 2/ Group 1	264000 K6.06	**264000 K6.09**better match to question
RO TIER 2/ Group 2	204000 A4.05 RO	**204000 A4.06** RO better match to question
SRO/RO TIER 2/ Group 3	288000 K3.05	**288000 K4.03**better match to question
SRO TIER 1/ Group 1	295013 AK3.02 SRO	**295013 2.1.12 SRO**better match to question
SRO TIER 1/ Group 2	295012 2.4.49 SRO	**295012 AK2.02 SRO**unable to write appropriate LOD
	500000 EA1.05	Now on SRO only
	295029 EA1.03 RO	Now common
	295020 2.1.23 RO	Now common
		The following changes were made after exam submittal. Changes resulted from NRC review of the initial written submittal and facility rework to address the NRC comments.
SRO Tier 3	2.1.13	Deselected 2.1.13 due to potential security procedure concern. Randomly selected 2.1.27. This was a system purpose KA and inappropriate for SRO only question. Deselected 2.1.27 and randomly selected 2.1.9. Developed SRO only question, which was rejected by Chief Examiner. Deselected 2.1.9 and randomly selected 2.4.30. Developed new question for 2.4.30 for SRO only Question 86.
RO TIER 2/GROUP 1 SRO TIER 2/GROUP 2	201002 K3.01	**215005 K6.07 randomly selected.** Unable to write acceptable question for original KA. Change to 215005 K6.07 resulted in SRO Tier 2 Group 1 total points equals 24 instead of 23 and SRO Tier 2 Group 2 equal 12 points instead of 13. This is allowed by Form ES 401-1, Rev 8 Supp 1, Note 2. (Allowance to be + or - 1, due to required changes).
RO TIER 1/GROUP 2 SRO TIER 1 GROUP 1	295017 AK3.04	**295017 AK3.02 randomly selected.** Unable to write acceptable question after multiple attempts for original KA

Final Document. Represents the "as administered" written exam on August 2, 2002.

RO TIER 1/GROUP 1 SRO TIER 2 GROUP 2	259001 K6.05	**259001 K6.01 randomly selected.** Unable to write acceptable question after multiple attempts for original KA

Final Document. Represents the "as administered" written exam on August 2, 2002.

ES-401 BWR SRO Examination Outline Form ES-401-1 (R8, S1)

Facility: NMPC U2	Date of Exam: 07/29/02	Exam Level: SRO												
Tier	Group	K/A Category Points												Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *		
1. Emergency & Abnormal Plant Evolutions	1	5	4	3				5	4			5		26
	2	3	2	3				3	3			3		17
	Tier Totals	8	6	6				8	7			8		43
2. Plant Systems	1	2	2	3	1	3	2	2	2	2	2	3		24
	2	1	1	1	1	1	1	2	1	0	1	2		12
	3	0	0	0	1	1	0	0	1	0	0	1		4
	Tier Totals	3	3	4	3	5	3	4	4	2	3	6		40
3. Generic Knowledge and Abilities		Cat 1			Cat 2			Cat 3			Cat 4			17
		3			4			4			6			

Final Document. Represents the "as administered" written exam on August 2, 2002.

Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).

2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final exam must total 100 points.

3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.

4. Systems/evolutions within each group are identified on the associated outline.

5. The shaded areas are not applicable to the category/tier.

6.* The generic 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.

7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.

ES-401 BWR SRO Examination OutlineForm ES-401-1 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295003 Partial or Complete Loss of AC Pwr / 6	X						AK1.03 Knowledge of the operational applications of the following concepts as they apply to the Partial or Complete Loss of AC Pwr: Under voltage/degraded voltage effects on electrical loads (1)	3.2	1
295006 SCRAM / 1		X			X		AK2.06 Knowledge of the interrelations between SCRAM and the following: Reactor power (2)	4.3	1
							AA2.04 Ability to determine and interpret the following as they apply to SCRAM: Reactor pressure (3) SRO Only	4.1	1
295007 High Reactor Pressure / 3					X		AA2.03 Ability to determine and interpret the following as they apply to High Reactor Pressure: Reactor water level (4) SRO Only	3.7	1
295009 Low Reactor Water Level / 2				X			AA1.01 Ability to operate and/or monitor the following as they apply to Low Reactor Water Level: Reactor feedwater (5)	3.9	1
295013 High Suppression Pool Temp. / 5		X				X	AK2.01 Knowledge of the interrelations between High Suppression Pool Temp. and the following: Suppression pool cooling (6)	3.7	1
							2.1.12 Knowledge of surveillance procedures (7) SRO Only	3.4	1
295014 Inadvertent Reactivity Addition / 1	X			X			AK1.05 Knowledge of the operational applications of the following concepts as they apply to the Inadvertent Reactivity Addition: Fuel thermal limits (8)	4.2	1
							AA1.07 Ability to operate and/or monitor the following as they apply to Inadvertent Reactivity Addition: Cold water injection (10)	4.1	1
295015 Incomplete SCRAM / 1		X					AK2.10 Knowledge of the interrelations between Incomplete SCRAM and the following: SPDS/ERIS/CRIDS/GDS (11)	3.0	1
295016 Control Room Abandonment / 7			X				AK3.02 Knowledge of the reasons for the following responses as they apply to Control Room Abandonment: Turbine trip (12)	3.8	1
295017 High Off-site Release Rate / 9			X				AK3.02 Knowledge of the reasons for the following responses as they apply to High Off-site Release Rate: Plant Ventilation Systems (13)	3.5	1
295023 Refueling Accidents / 8					X	X	AA2.05 Ability to determine and interpret the following as they apply to Refueling Accidents: Entry conditions of emergency plan(14) SRO Only	4.6	1
							2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies (15) SRO Only	3.6	1
295024 High Drywell Pressure / 5				X			EA1.19 Ability to operate and/or monitor the following as they apply to High Drywell Pressure: Containment atmosphere control (16)	3.4	1
295025 High Reactor Pressure / 3		X		X			EK2.04 Knowledge of the interrelations between High Reactor Pressure and the following: ARI/RPT/ATWS (17)	4.1	1
							EA1.08 Ability to operate and/or monitor the following as they apply to High Reactor Pressure: RRCS (18)	3.7	1
295026 Suppression Pool High Water Temp. / 5	X					X	EK1.01 Knowledge of the operational applications of the following concepts as they apply to the High Suppression Pool Water Temp: Pump NPSH (19)	3.4	1
							2.2.22 Knowledge of limiting conditions for operations and safety limits (20) SRO Only	4.1	1
295030 Low Suppression Pool Water Level / 5			X		X		EK3.03 Knowledge of the reasons for the following responses as they apply to Low Suppression Pool Water Level: RCIC operation (21)	3.7	1
							EA2.02 Ability to determine and interpret the following as they apply to Low Suppression Pool Water Level: Suppression pool temperature (22)	3.9	1

Final Document. Represents the "as administered" written exam on August 2, 2002.

295031 Reactor Low Water Level / 2	X					X	EK1.03 Knowledge of the operational applications of the following concepts as they apply to the Reactor Low Water Level: Water level effects on reactor power (23)	4.1	1
							2.1.33 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications (24) SRO Only	4.0	1
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1	X						EK1.06 Knowledge of the operational applications of the following concepts as they apply to the SCRAM Condition Present and Power Above APRM Downscale or Unknown: Cooldown effects on reactor power (25)	4.2	1
500000 High Containment Hydrogen Conc. / 5				X		X	EA1.05 Ability to operate and/or monitor the following as they apply to High Containment Hydrogen Conc.: Wetwell sprays (26) SRO Only	3.3	1
							2.1.32 Ability to explain and apply system limits and precautions (27)	3.8	1
K/A Category Totals:	5	4	3	5	4	5	Group Point Total:		26

Final Document. Represents the "as administered" written exam on August 2, 2002.

ES-401 BWR SRO Examination OutlineForm ES-401-1 (R8, S1) Emergency and Abnormal Plant Evolutions - Tier 1/Group 2									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295002 Loss of Main Condenser Vacuum / 3			X			X	AK3.05 Knowledge of the reasons for the following responses as they apply to **Loss of Main Condenser Vacuum**: Main steam isolation valve (28) 2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures (29)	3.4 4.3	1 1
295004 Partial or Total Loss of DC Pwr / 6	X				X		AK1.02 Knowledge of the operational applications of the following concepts as they apply to the **Partial or Complete Loss of DC Pwr**: Redundant D.C. power supplies (30) AA2.01 Ability to determine and interpret the following as they apply to **Partial or Total Loss of DC Pwr**: Cause of partial or complete loss of D.C. power (31) SRO Only	3.4 3.6	1 1
295005 Main Turbine Generator Trip / 3		X		X			AK2.04 Knowledge of the interrelations between **Main Turbine Generator Trip** and the following: Main generator protection (32) AA1.05 Ability to operate and/or monitor the following as they apply to **Main Turbine Generator Trip**: Reactor/turbine pressure regulating system (33)	3.3 3.6	1 1
295008 High Reactor Water Level / 2				X			AA1.06 Ability to operate and/or monitor the following as they apply to **High Reactor Water Level**: HPCS (34)	2.8	1
295012 High Drywell Temperature / 5		X					AK2.02 Knowledge of the interrelations between **HIGH DRYWELL TEMPERATURE** and the following: Drywell cooling (35) SRO Only	3.7	1
295019 Partial or Total Loss of Inst. Air / 8			X				AK3.02 Knowledge of the reasons for the following responses as they apply to **Part. or Comp. Loss of Inst. Air**: Standby air compressor operation (36)	3.4	1
295020 Inadvertent Cont. Isolation / 5 & 7						X	2.1.23 Ability to perform specific system and integrated plant procedures during different modes of plant operation (37)	4.0	1
295021 Loss of Shutdown Cooling / 4					X		AA2.02 Ability to determine and interpret the following as they apply to **Loss of Shutdown Cooling**: RHR/shutdown cooling system flow (38) SRO Only	3.4	1
295022 Loss of CRD Pumps / 1	X						AK1.01 Knowledge of the operational applications of the following concepts as they apply to the **Loss of CRD Pumps**: Reactor pressure vs. rod insertion capability (39)	3.4	1
295029 High Suppression Pool Water Level / 5	X			X			EK1.01 Knowledge of the operational applications of the following concepts as they apply to the **High Suppression Pool Water Level**: Containment integrity (40) SRO Only EA1.03 Ability to operate and/or monitor the following as they apply to **High Suppression Pool Water Level**: RHR/LPCI (41)	3.7	1
295032 High Secondary Containment Area Temperature / 5					X	X	EA2.03 Ability to determine and interpret the following as they apply to X **High Secondary Containment Area Temperature**: Cause of high area temperature (42) SRO Only 2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits (43) SRO Only	4.0 3.7	1 1
295035 Secondary Containment High Differential Pressure / 5			X				EK3.02 Knowledge of the reasons for the following responses as they apply to **Secondary Containment High Differential Pressure**: Secondary containment ventilation response (44)	3.5	1
K/A Category Point Totals:	3	2	3	3	3	3	Group Point Total:		17

ES-401BWR SRO Examination OutlineForm ES-401-1 (R8, S1) Plant Systems - Tier 2/Group 1

Final Document. Represents the "as administered" written exam on August 2, 2002.

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)	Imp.	Points
202002 Recirculation Flow Control			X	X								K3.06 Knowledge of the effect that a loss or malfunction of the Recirculation Flow Control will have on the following: Recirculation flow control valve position (45) K4.09 Knowledge of Recirculation Flow Control design feature(s) and or interlock(s) which provide for the following: Minimum and maximum flow control valve position setpoints (46)	3.7 3.4	1 1
203000 RHR/LPCI: Injection Mode			X									K3.03 Knowledge of the effect that a loss or malfunction of the RHR/LPCI: Injection Mode will have on the following: Automatic depressurization logic (47)	4.3	1
209001 LPCS									X			A3.04 Ability to monitor automatic operations of the LPCS including: System flow (48)	3.6	1
209002 HPCS	X									X		K1.02 Knowledge of the physical connections and/or cause-effect relationships between HPCS and the following: Suppression pool (49) A4.07 Ability to manually operate and/or monitor in the control room: Line fill pump (50)	3.5 2.8	1 1
211000 SLC	X										X	K1.05 Knowledge of the physical connections and/or cause-effect relationships between SLC and the following: RWCU (51) 2.1.32 Ability to explain and apply system limits and precautions (52) SRO Only	3.6 3.8	1 1
215005 APRM / LPRM						X					X	K6.07 Knowledge of the effect of a loss or malfunction of the following will have on APRM/LPRM System : Flow Converter/Comparator (69) 2.1.32 Ability to explain and apply system limits and precautions (54) SRO Only	3.3 3.8	1 1
217000 RCIC		X								X		K2.04 Knowledge of electrical power supplies to the following: Gland seal compressor (vacuum pump) (55) A4.08 Ability to manually operate and/or monitor in the control room: RCIC system flow (53)	2.6 3.6	1 1
218000 ADS					X				X			K5.01 Knowledge of the operational implications of the following concepts as they apply to the ADS ADS logic operation (56) A3.03 Ability to monitor automatic operations of the ADS including: ADS valve acoustical monitor noise (57)	3.8 3.8	1 1
223001 Primary CTMT and Auxiliaries		X			X							K2.09 Knowledge of electrical power supplies to the following: Drywell cooling fans (58) K5.01 Knowledge of the operational implications of the following concepts as they apply to the Primary CTMT and Auxiliaries Vacuum breaker/relief operation (59)	2.9 3.3	1 1
223002 PCIS/Nuclear Steam Supply Shutoff							X					A1.02 Ability to predict and/or monitor changes in parameters associated with operating the PCIS/Nuclear Steam Supply Shutoff controls including: Valve closures (60)	3.7	1

Final Document. Represents the "as administered" written exam on August 2, 2002.

239002 SRVs								X			X	A2.03 Ability to (a) predict the impacts of the following on the SRVs and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Stuck open SRV (61) 2.4.6 Knowledge symptom based EOP mitigation strategies (62) SRO Only	4.2 4.0	1 1
241000 Reactor/Turbine Pressure Regulator							X					A1.13 Ability to predict and/or monitor changes in parameters associated with operating the Reactor/Turbine Pressure Regulator controls including: Main turbine speed (63)	2.7	1
259002 Reactor Water Level Control						X		X				K6.03 Knowledge of the effect that a loss or malfunction of the following will have on the Reactor Water Level Control: Main steam flow input (64) A2.06 Ability to (a) predict the impacts of the following on the Reactor Water Level Control and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of controller signal output (65)	3.1 3.4	1 1
262001 AC Electrical Distribution			X									K3.01 Knowledge of the effect that a loss or malfunction of the AC Electrical Distribution will have on the following: Major system loads (66)	3.7	1
264000 EDGs						X						K6.09 Knowledge of the effect that a loss or malfunction of the following will have on the EDGs: D.C. power (67)	3.5	1
K/A Category Point Totals:	2	2	3	1	3	2	2	2	2	2	3	Group Point Total:		24

Final Document. Represents the "as administered" written exam on August 2, 2002.

ES-401 BWR SRO Examination OutlineForm ES-401-1 (R8, S1)

Plant Systems - Tier 2/Group 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)	Imp.	Points
201001 CRD Hydraulic											X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures (68) SRO Only	4.3	1
214000 RPIS										X		A4.03 Ability to manually operate and/or monitor in the control room: Control rod drive temperature (70)	2.7	1
215002 RBM								X				A2.01 Ability to (a) predict the impacts of the following on the RBM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Withdrawal of control rod in high power region of core (71)	3.5	1
215003 IRM				X								K4.02 Knowledge of IRM design feature(s) and or interlock(s) which provide for the following: Reactor SCRAM signals (72)	4.0	1
234000 Fuel Handling Equipment					X							K5.05 Knowledge of the operational implications of the following concepts as they apply to the Fuel Handling Equipment: Fuel orientation (73)	3.7	1
259001 Reactor Feedwater						X	X					K6.05 Knowledge of the effect that a loss or malfunction of the following will have on the Reactor Feedwater: Component cooling water (74) A1.01 Ability to predict and/or monitor changes in parameters associated with operating the Reactor Feedwater System controls including: Feedwater flow/pressure (75)	2.7 3.3	1 1
263000 DC Electrical Distribution		X					X					K2.01 Knowledge of electrical power supplies to the following: Major D.C. loads (76) A1.01 Ability to predict and/or monitor changes in parameters associated with operating the DC Electrical Distribution controls including: Battery charging/discharging rate (77)	3.4 2.8	1 1
286000 Fire Protection			X								X	K3.01 Knowledge of the effect that a loss or malfunction of the Fire Protection will have on the following: The ability to detect fires (78) 2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies (79) SRO Only	3.4 3.6	1 1
400000 Component Cooling Water	X											K1.02 Knowledge of the physical connections and/or cause-effect relationships between Component Cooling Water and the following: Loads cooled by CCWS (80)	3.4	1
K/A Category Point Totals:	1	1	1	1	1	1	2	1	0	1	2	Group Point Total:		12

Final Document. Represents the "as administered" written exam on August 2, 2002.

ES-401 BWR SRO Examination OutlineForm ES-401-1 (R8, S1)

Plant Systems - Tier 2/Group 3

System # / Name	K 1	K 2	K 3	K 4	K 5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
201003 Control Rod and Drive Mechanism					X							K5.03 Knowledge of the operational implications of the following concepts as they apply to the Control Rod and Drive Mechanism: Reactor power control (81)	3.4	1
233000 Fuel Pool Cooling and Cleanup											X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures (82) SRO Only	4.3	1
288000 Plant Ventilation				X								K4.03 Knowledge of Plant Ventilation Systems design feature(s) and/or interlocks which proide for the following: Automatic starting and stopping of fans (83)	2.9	1
290002 Reactor Vessel Internals								X				A2.02 Ability to (a) predict the impacts of the following on the Reactor Vessel Internals and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Overpressurization transient (84)	3.9	1
K/A Category Point Totals:	0	0	0	1	1	0	0	1	0	0	1	Group Point Total:		4

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points
Tier 3 Common Generic 2.2.11	Tier 3 Common Generic 2.2.34	An appropriate question can not be developed. Generic Fundamentals level of knowledge.	1
Tier 2 Group 2 259001 A1.01	Tier 2 Group 2 259001 K5.02	An appropriate question can not be developed. Generic Fundamentals level of knowledge.	1
Tier 2 Group 1 217000 A4.08	Tier 2 Group 1 215005 K4.08	An appropriate question can not be developed. Replaced with RCIC operation question because of higher operational significance.	1
Plant-Specific Priority Total (limit 10):			3

Final Document. Represents the "as administered" written exam on August 2, 2002.

ES-401 Generic Knowledge and Abilities Outline (Tier 3) Form ES-401-5 (R8, S1)

Facility: NMPC U2 Date of Exam: 07/29/02 Exam Level: SRO

Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.6	Ability to supervise and assume a management role during plant transients and upset conditions (85) SRO Only	4.3	1
	2.1.14	Knowledge of system status criteria which require the notification of plant personnel (87)	3.3	1
	2.1.31	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup (88)	3.9	1
	Total			3
Equipment Control	2.2.12	Knowledge of surveillance procedures (89)	3.4	1
	2.2.17	Knowledge of the process for managing maintenance activities during power operations (90) SRO Only	3.5	1
	2.2.23	Ability to track limiting conditions for operations (91) SRO Only	3.8	1
	2.2.11	Knowledge of the process for controlling temporary changes (92)	3.4	1
	Total			4
Radiation Control	2.3.8	Knowledge of the process for performing a planned gaseous radioactive release (93) SRO Only	3.2	1
	2.3.9	Knowledge of the process for performing a containment purge (94)	3.4	1
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure (95) SRO Only	3.3	1
	2.3.11	Ability to control radiation releases (96)	3.2	1
	Total			4
Emergency Procedures/ Plan	2.4.18	Knowledge of the specific bases for EOPs (97)	3.6	1
	2.4.22	Knowledge of the bases for prioritizing s afety functions during abnormal/emergency operations (98) SRO Only	4.0	1
	2.4.27	Knowledge of fire in plant procedure (99)	3.5	1
	2.4.30	Knowledge of which events related to system operation/status should be reported to outside agencies (86) SRO Only	3.6	1
	2.4.32	Knowledge of operator response to loss of all annunciators(100)	3.5	1
	2.4.35	Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications (9)	3.5	1
	Total			6
Tier 3 Point Total (SRO)				17

Final Document. Represents the "as administered" written exam on August 2, 2002.

NRC Comments on Written Exam					
Question	**Unsats**	**Comment**	**Response**	**KA Change**	**Enclosed**
RO2	E	Cue			X
RO4		Error in Justification section			X
RO15	U	Didn't understand B & D distractors	Modified stem and distractors		X
RO19	U	Borderline KA match	Wrote new question		X
RO20	Setpoint	Setpoiont Question	Wrote new question		X
RO23	U	Partial correct answer.	Modified distractors		X
RO24	U	A,B, and C are implausible distractors	Replaced KA and wrote new question	Y	X
RO28	E				X
RO38	U	LOD, non dirscriminating	Replaced KA and wrote new question	Y	X
RO42	U	C & D implausible	Added explanation as to plausibility		X
RO43	U	KA Mismatch	Wrote new question		X
RO44	U	Math problem, minutia	Wrote new question		X
RP51	U	LOD, non dirscriminating	Replaced KA and wrote new question. Modified again after the first new question was similar to a JPM	Y	X
RO61	U	LOD, Basic system knowledge	Replaced KA and wrote new question	Y	X
RO62	U	C & D implausible	Rewrote, then rewrote again. Changed "total" steam flow to "one" transmitter		X
RO70	U	Green Full In light OFF is implausible.	Changed to Process Computer indication		X
RO83	E	Words missing in stem	Fixed		X
RO93	E	"A" is general in nature and could be change of intent	Fixed		X
RO95	U	LOD 1	Fixed by removing specific values		X
RP98	E	Plausibility of B,C and D?	Rewrote and made open reference		X
SRO38	U		Modified stem and justification section		X
SRO86	U		Replaced KA and wrote new question	Y	X
SRO95	E		Fixed		X

Final Submittal - Summary
Reflects revisions made

RO 96		When RO 24 was replaced, it became a duplicate with 96. Wrote new 96		X
RO Cat A Admin Exam				
Item	**Comment**	**Response**	**Outline Change?**	**Enclosed**
JPM A.1.2	Redundent with JPM A.4 and non-discriminating	Changed Outline. Replaced JPM with 2 open reference questions (A.1.1, A.1.2	Y	X
JPM A.4	Remove reference to EPP-04 in Initiating Cue	Fixed		X
JPM A.2	Needs to be Safety Related component	Fixed. Spent Fuel Pool Cooling Pump		X
JPM A.3	Obtain more readable copy of the survey map	Obtained an electronic copy		X
SRO Cat A Admin Exam				
JPM A.1.2	Provide 3D Monicore printout for evaluation and determining MAPLHGR is out of spec	Done		X
JPM A.3.1	Remove cue to make candidate determine the appropriate action	Done		X
Cat B JPMs				
JPM 2	Make step 4 Pass/Fail	Done		X
JPM 3	Make step 12 Pass/Fail	Done		X
JPM 4	Make step 9 Pass/Fail. Removed two cues for additional operator monitoring system delta flow timers	Done		X
JPM 6	Make step 3 Pass/Fail	Done		X
JPM 7	Make step 4 Pass/Fail	Done		X
JPM 8	Make step 4 Pass/Fail. Swap TS step, which is out of sequence.	Done		X
JPM 10		Made opening circuit breakers Pass/Fail		X

Tier / Group	Randomly Selected K/A	Reason for Rejection
Various	Line out of K/As in Attached NUREG 1123	K/As not applicable to Nine Mile Point Unit 2 design per ES-401 D.1.b
TIER 1 and TIER 2	GENERIC K/As	Non-system GENERIC K/A statements suppressed per NRC Suppression Guidance Letter, 'Clarification of Guidance Regarding the Elimination of Inappropriate Knowledge and Abilities (K/A) on Written Operator Licensing Examinations' and ES-401 D.1.b
Various	<2.5 Importance Rating	All K/As with Importance rating less than 2.5 will not be selected during random generation per ES-401 D.1.b
TIER 2/GROUP 2 RO ONLY	214000 K4.02	Randomly reselected K4.01, to avoid double jeopardy with A4.03. K4.02 is similar to A4.03.
TIER 2/GROUP 2 RO ONLY	215002 2.4.49	Randomly reselected 2.4.50, 2.4.49 is not applicable, due to no Immediate Operator Actions for RBM at NMPC U2
TIER 2/GROUP 3 RO ONLY	233000 K2.02	Randomly reselected K4.06, K2.02 is not applicable, Spent Fuel Pool Cooling System contains its' own system pumps.
TIER 2/GROUP 1 SRO/RO	211000 K1.07	Randomly reselected K1.05, K1.07 is not applicable to Nine Mile Point Unit 2 design. SLS system injects through the HPCS sparger inside the downcomer.
TIER 2/GROUP 1 SRO/RO	239002 A2.04	Randomly reselected A2.03, due to over-sampling of ADS logic when compared with sampling in 218000 and 203000.
		The following are changes made to written exam outlines after initial outline submittal. These are also identified on Form 401-1 and 401-2 Written Outlines.
TIER 2/GROUP 2 RO ONLY	290003 K6.04	290003 K5.01 An appropriate question can not be developed. HVAC Fire system is manual valves.
TIER 3 RO/SRO	Common Generic 2.2.34	Generic 2.2.11 An appropriate question can not be developed. Generic Fundamentals level of knowledge.
TIER 2/GROUP 1 (RO) **TIER 2/GROUP 2 (SRO)**	259001 K5.02	259001 A1.01 An appropriate question can not be developed. Generic Fundamentals level of knowledge.
RO TIER 1/	500000 EA1.05	**500000 EK3.05 RO** selected, unable to write question to original K/A for RO position

Group 1		
SRO/RO TIER 1/ Group 1	500000 2.1.28	**500000 2.1.32 selected,** unable to write question to original K/A
SRO/RO TIER 1/ Group 2	295022 AK2.02	**295002 2.4.4, selected** SRO original K/A overlap with RO outline when selected as a common
SRO/RO TIER 1/ Group 2	295029 EK1.01	**295005 AA1.05** SRO made into common reselected to K/A applicable to both RO and SRO
RO TIER 1/ Group 3	295036 EK2.02 RO	**295021 AK3.01 RO** original K/A not applicable at NMPC 2 reselected to new K/A
SRO/RO TIER 2/ Group 2	215002 A2.04	**215002 A2.01** better match to question
RO TIER 1/ Group 2 SRO TIER 1/ Group 2	295030 EA2.01	**295030 EA2.02** better match to question
SRO/RO TIER 2/ Group 1	264000 K6.06	**264000 K6.09** better match to question
RO TIER 2/ Group 2	204000 A4.05 RO	**204000 A4.06 RO** better match to question
SRO/RO TIER 2/ Group 3	288000 K3.05	**288000 K4.03** better match to question
SRO TIER 1/ Group 1	295013 AK3.02 SRO	**295013 2.1.12 SRO** better match to question
SRO TIER 1/ Group 2	295012 2.4.49 SRO	**295012 AK2.02 SRO** unable to write appropriate LOD
	500000 EA1.05	Now on SRO only
	295029 EA1.03 RO	Now common
	295020 2.1.23 RO	Now common
		The following changes were made after exam submittal. Changes resulted from NRC review of the initial written submittal and facility rework to address the NRC comments.
SRO Tier 3	2.1.13	Deselected 2.1.13 due to potential security procedure concern. Randomly selected 2.1.27. This was a system purpose KA and inappropriate for SRO only question. Deselected 2.1.27 and randomly selected 2.1.9. Developed SRO only question, which was rejected by Chief Examiner. Deselected 2.1.9 and randomly selected 2.4.30. Developed new question for 2.4.30 for SRO only Question 86.
RO TIER 2/GROUP 1 SRO TIER 2/GROUP 2	201002 K3.01	**215005 K6.07 randomly selected.** Unable to write acceptable question for original KA. Change to 215005 K6.07 resulted in SRO Tier 2 Group 1 total points equals 24 instead of 23 and SRO Tier 2 Group 2 equal 12 points instead of 13. This is allowed by Form ES 401-1, Rev 8 Supp 1, Note 2. (Allowance to be + or - 1, due to required changes).

RO TIER 1/GROUP 2 SRO TIER 1 GROUP 1	295017 AK3.04	**295017 AK3.02 randomly selected.** Unable to write acceptable question after multiple attempts for original KA
RO TIER 1/GROUP 1 SRO TIER 2 GROUP 2	259001 K6.05	**259001 K6.01 randomly selected.** Unable to write acceptable question after multiple attempts for original KA

Resolution of Comments Annotated in Bold & Italics

Review Worksheet

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q≠ K/A	SRO Only		
1	F	2												S	
2	F	2		X										E	Power and press. emphasized in the stem which cues correct answer also highlight in the stem MSIV . ***Licensee reformatted the stem.***
3	H	3												S	
4	H	2												S	
5	F	2												S	
6	H	2-3												S	
7	H	3												S	
8	H	2												S	
9	H	2												S	
10	F	2												S	set point question - okay in limited number

Instructions

[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 using a 1 - 5 (easy - difficult) rating scale (questions in the 2 - 4 range are acceptable).
3. Check the appropriate box if a psychometric flaw is identified:
   - The stem lacks sufficient focus to elicit the correct answer (e.g., unclear intent, more information is needed, or too much needless information).
   - The stem or distractors contain cues (i.e., clues, specific determiners, phrasing, length, etc).
   - The answer choices are a collection of unrelated true/false statements.
   - More than one distractor is not credible.
   - One or more distractors is (are) partially correct (e.g., if the applicant can make unstated assumptions that are not contradicted by stem).
4. Check the appropriate box if a job content error is identified:
   - 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).
   - 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).
   - The question contains data with an unrealistic level of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons).
   - The question requires reverse logic or application compared to the job requirements.
5. Check the appropriate box if the sampled question does not match the approved K/A or an SRO-only question is not at the SRO level.
6. Based on the reviewer's judgment, is the question as written (U)nacceptable (requiring repair or replacement), in need of (E)ditorial enhancement, or (S)atisfactory?
7. For any "U" ratings, at a minimum, explain how the Appendix B psychometric attributes are not being met.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5 Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q ≠ K/A	SRO Only	U/E/S	Explanation
11	H	3												S	Verify for all RO EOP question on the exams that this is **required** knowledge for an RO at your facility. We discussed that beyond the identification of entry conditions and EOP bases it is not RO level knowledge interpret and apply the EOPs given a set of conditions. ***The licensee verified that the Ros had appropriate EOP learning objectives to test these areas.***
12	F	2												S	
13	F	2												S	
14	H	3												S	
15	F	2				X								U	"B&D" distractors do not appear to be plausible at 8.5" hg Vac - how do we get inventory loss? ***Modified stem and distractors***
16	F	2												S	
17	F	3												S	
18	H	3												S	
19	F	2										X		U	licensee agreed. ***Wrote new question***
20	F	1-2												U	set point question okay in limited numbers. However, LOD is very low does not discriminate. ***Licensee replaced with an acceptable bank question .***
21	F	2												S	
22	H	3												S	
23	F	3	X				X							U	The question asks about method for tripping the turbine - "C" presents the same method for tripping the Main turbine looks to be partially correct. ***Modified distractors***.
24	H	2				X								U	Distractors not plausible. How would you get a power excursion in either case even if you blew down first. Why would the MSIVs close on a reactor scram. Need to explain why these are plausible. ***Licensee replaced question.***
25	F	1- 2												S	set point okay in limited number
26	F	2												S	
27	H	3												S	
28	H	2					X							E	why would a broken tailpipe necessarily improve NPSH - it depends on where the break ? ***Modified distractor.***

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5 Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q-K/A	SRO Only		
29	H	2												S	
30	F	2												S	

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5 Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q-K/A	SRO Only		
31	H	3												S	
32	H	3												S	
33	F	2												S	
34	H	3												S	
35	H	3												S	
36	H	3												S	
37	H	2												S	
38	F	1-2				X								U	Distractors do not appear to be credible also LOD is borderline doesn ot discriminate too basic. Licensee agreed. ***Replaced question***
39	H	2												S	
40	F	2												S	
41	F	2												S	
42	H	2				X								U	Distractors do not appear to be credible especially "C&D". ***Explained why distractors are plausible***
43	F	2										X		U	not in LPCI mode. Licensee agreed will replace. ***Question replaced.***
44	F	1-2							X					U	This doesn't test plant knowledge only the ability to perform a simple math problem. ***Replaced question.***
45	F	2												S	
46	H	2												S	
47	F	2												S	
48	F	2												S	set point question okay in limited number.
49	F	2												S	
50	H	2												S	

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q-K/A	SRO Only	U/E/S	Explanation
51	F	1-2							X					U	Knowing # of inputs is minutia - not important to safe operation of the plant. LOD borderline. ***Replaced question***
52	H	3												S	
53	H	3												S	
54	H	3												S	
55	F	2												S	electrical supply okay in limited #
56	H	2												S	
57	F	2												S	
58	F	2												S	
59	F	2												S	
60	H	3												S	
61	F	1-2												U	Borderline LOD system purpose question - does not discriminate. ***Replaced question***
62	H	3				X								E	"C&D" don't appear plausible. ***Changed stem***
63	H	3												S	
64	H	3												S	
65	H	3												S	
66	H	2												S	
67	H	2												S	
68	H	3												S	
69	H	3												S	
70	H	2				X								E	"A&C" not credible distractors. ***Revised stem and distractors - plausible if don't understand system operatioin.***

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q=K/A	SRO Only	U/E/S	Explanation
71	H	2												S	
72	H	2												S	
73	H	2												S	
74	H	3												S	
75	H	3												S	
76	F	3												S	
77	F	3												S	
78	H	3												S	
79	H	2												S	
80	H	2												S	
81	H	2												S	
82	F	2												S	
83	F	2												S	see minor editorial comments for stem
84	H	3												S	
85	F	2												S	
86	H	3												S	
87	H	2												S	
88	F	2												S	
89	F	2												S	
90	H	3												S	

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5 Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q≠ K/A	SRO Only	U/E/S	***Explanation***
91	F	2												S	
92	H	3												S	***good question***
93	F	2												E	"A" could be agrued that it could result in a change of intent - too general - revise distractor to make more specific.
94	F	2												S	
95	F	2		X										E	With the stated pressure limitations stated in the stem- the answer apears to be obvious. ***Modified stem to make less leading***
96	F	2												S	
97	F	2												S	
98	F	2				X								S?	Distractors don't appear plausible. Licensee will verify if plausibe. ***Rewrote stem***
99	F	2												S	
100	H	3												S	
SRO															
3	H	2												S	provide all of TS sect. 3
4	H	3												S	
7	H	3												S	
14	H	3												S	
15	H	2												S	
20	H	2												S	
24	H	3												S	
26	H	3												S	

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5 Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q-K/A	SRO Only	U/E/S	Explanation
31	H	3												S	
35	H	3												S	Okay if give entire TS section 3 if give on this section it would be like a direct lookup.
38	H	2				X								E	"B&C" distractors don't seem credible. Have you lost secondary containment? And why would starting SBGT be plausibel? ***Revised stem and provided more justification for distractors.***
40	F	2												S	
42	H	2												S	
43	H	3												S	
52	H	2												S	
54	H	3												S	
62	H	3												S	
68	H	3					X							S	Is "A" partially correct? Licensee agreed to make sure this is not correct by checking other procedures.
79	H	3												S	
82	H	3												S	
85	F	3												S	
86	F	3												U	Current security requirements and NRC regulations/guidance would not allow this - verify acceptable with security officer. Please document a document changes request and enter into your corrective action program. ***Licensee replaced question.***
90	F	3												S	
91	H	3												S	
93	H	3												S	
95	H	3	X			X								E	"C&D" distractors don't appear credible. ***Licensee revised the stem to place RP supervisor in the stem and ask who besides the RP supv. Is required to authorize.***
98	H	3												S	

OPERATING EXAM COMMENTS:

- RO, A1 JPM, Perform a refuel floor evac. - Replace this JPM. Although, the task is important to safety - it doesn't discriminate for making a licensing decision, also this is redundant to the A.4 task in the sense it is another notification task. *Replaced JPM with 2 new questions.*

- RO, A.2 JPM, Develop clearance for Hot Water Heating Pump, is not a safety significant pump? Please select a safety significant pump and have the candidate determine the blocking and tagging points and indicating the valves, and breaker required positions and tagging that would be required - forms not required? Also do not provide prints have candidate locate correct prints. *Replaced with new JPM on safety significant component.*

- RO, A.3.1 question, Radiation Wok permit question. What is the highest rad level on the survey map? Get a clearer easy to read survey map for the exam.

- RO, A.4 JPM, Perform required actions for injured and contaminated person. Have the CSO determine what procedure to use. Cue As CSO make required notifications. *Initiating cue revised as suggested to make less leading.*

- SRO, A.1.2 JPM, Determine TS actions when in Single Loop. Step #3 don't cue MAPLHGR is OOS provide printout and let candidate determine OOS.

- SRO, A.3 JPM, Initiating cue should be less leading, e.x. Take appropriate actions to ensure personnel safety. *Initiating cue revised as suggested to make less leading.*

- Asked licensee why the Admin. JPM that was planned for Radwaste Discharge Authorization was replaced. They had indicated on their Summary of Changes Following Initial Outline submittal that it was replaced because it was too difficult to administer. This has been used on many exams and is a good task so we agreed to discuss this further during prep week and for them to show why this determination was made. *Determined to be too complex to administer for testing purposes also after initial licensing the SROs are provided additional supervisory training on performing this function.*

- JPMs - some critical steps were not marked as critical. The following steps will be revised to critical steps: JPM #2 , step 4; JPM #3, step 12; JPM #4, step 9; JPM #6, step 3; JPM #7, step 4; JPM #8, step 4.

- Scenarios - Critical Tasks in 8 of 10 cases do not meet the criteria established in NUREG 1021, Appendix D, section D.1.c, Measurable Performance Indicators. For example, in most cases no guidance is provided for when or by what point must the action be taken to be considered a failure. The licensee agreed with the comment and revised the CTs to provide further additional performance acceptance criteria.