

Facility:		TMI Unit 1		Date of Exam:		4/22/2007												
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	4	3	6				1	2			2	18	3	3	6		
	2	0	3	3				3	0			0	9	2	2	4		
	Tier Totals	4	6	9				4	2			2	27	5	5	10		
2. Plant Systems	1	3	1	3	0	0	5	2	3	4	2	5	28	2	3	5		
	2	0	1	1	2	2	0	0	1	1	2	0	10	0	1	3		
	Tier Totals	3	2	4	2	2	5	2	4	5	4	5	38	3	5	8		
3. Generic Knowledge and Abilities Categories				1		2		3		4		10		1	2	3	4	7
				2		2		3		3				2	2	2	1	
Note:	1.	Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).																
	2.	The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ± 1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.																
	3.	Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to ES-401, Attachment 2, for guidance regarding elimination of inappropriate K/A statements.																
	4.	Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.																
	5.	Absent a plant specific priority, only those KAs having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.																
	6.	Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.																
	7.*	The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.																
	8.	On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) 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. Use duplicate pages for RO and SRO-only exams.																
	9.	For Tier 3, select topics from Section 2 of the K/A Catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10CFR55.43																

NRC Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
015 / Reactor Coolant Pump Malfunctions/ 4						X	AA2.01	Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): Cause of RCP failure	3.5	76
027 / Pressurizer Pressure Control System Malfunction / 3	X						2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.8	77
029 / Anticipated Transient Without Scram (ATWS) / 1	X						2.4.50	Emergency Procedures / Plan: Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	3.3	78
038 / Steam Generator Tube Rupture / 3						X	EA2.15	Ability to determine or interpret the following as they apply to a SGTR: Pressure at which to maintain RCS during S/G cooldown	4.4	79
054 / Loss of Main Feedwater / 4						X	AA2.06	Ability to determine and interpret the following as they apply to the Loss of Main Feedwater (MFW): AFW adjustments needed to maintain proper T-ave. and S/G level	4.3	80
065 / Loss of Instrument Air / 8	X						2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.8	81
007 / Reactor Trip / 1			X				EK2.02	Knowledge of the interrelations between a reactor trip and the following: Breakers, relays and disconnects	2.6	39
008 / Pressurizer Vapor Space Accident / 3						X	AA2.17	Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: Steam dump valve controller (position)	2.5	40
009 / Small Break LOCA / 3	X						2.1.2	Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation.	3.0	41
015 / Reactor Coolant Pump Malfunctions/ 4			X				AK2.07	Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following: RCP seals	2.9	42
022 / Loss of Reactor Coolant Makeup / 2						X	AA2.02	Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Makeup: Charging pump problems	3.2	43
025 / Loss of Residual Heat Removal System / 4					X		AA1.01	Ability to operate and/or monitor the following as they apply to the Loss of Residual Heat Removal System: RCS/RHRS cooldown rate	3.6	44
026 / Loss of Component Cooling Water / 8				X			AK3.03	Knowledge of the reasons for the following responses as they apply to the Loss of Component Cooling Water: Guidance actions contained in EOP for Loss of CCW/Nuclear Service Water	4.0	45

NRC Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
029 / Anticipated Transient Without Scram (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	46
038 / Steam Generator Tube Rupture / 3				X			EK3.03	Knowledge of the reasons for the following responses as they apply to the SGTR: Automatic actions associated with high radioactivity in S/G sample lines	3.6	47
054 / Loss of Main Feedwater / 4				X			AK3.03	Knowledge of the reasons for the following responses as they apply to the Loss of Main Feedwater (MFW): Manual control of AFW flow control valves	3.8	48
055 / Station Blackout / 6		X					EK1.02	Knowledge of the operational implications of the following concepts as they apply to the Station Blackout: Natural Circulation Cooling	4.1	49
056 / Loss of Off-site Power / 6		X					AK1.04	Knowledge of the operational implications of the following concepts as they apply to Loss of Offsite Power: Definition of saturation conditions, implication for the systems	3.1	50
057 / Loss of Vital AC Electrical Instrument Bus / 6	X						2.4.4	Emergency Procedures / Plan: Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.0	51
058 / Loss of DC Power / 6		X					AK1.01	Knowledge of the operational implications of the following concepts as they apply to Loss of DC Power: Battery charger equipment and instrumentation	2.8	52
062 / Loss of Nuclear Service Water / 4				X			AK3.02	Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water: The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS	3.6	53
E04 / Inadequate Heat Transfer / 4			X				EK2.2	Knowledge of the interrelations between the (Inadequate Heat Transfer) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	4.2	54
E05 / Excessive Heat Transfer / 4				X			EK3.2	Knowledge of the reasons for the following responses as they apply to the (Excessive Heat Transfer): Normal, abnormal and emergency operating procedures associated with (Excessive Heat Transfer).	3.5	55

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TMI Unit 1

Form ES-401-2

NRC Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
E10 / Post-Trip Stabilization / 1				X			EK3.4	Knowledge of the reasons for the following responses as they apply to the (Post-Trip Stabilization): RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated.	4.0	56
K/A Category Point Totals:	2/3	4	3	6	1	2/3	Group Point Total:			18/6

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NRC Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
037 / Steam Generator Tube Leak / 3	X						2.4.30	Emergency Procedures / Plan: Knowledge of which events related to system operations/status should be reported to outside agencies.	3.6	82
060 / Accidental Gaseous RadWaste Release / 9						X	EA2.04	Ability to determine and interpret the following as they apply to the Accidental Gaseous Radwaste: The effects on the power plant of isolating a given radioactive gas leak	3.4	83
067 / Plant Fire On-site / 8	X						2.2.25	Equipment Control: Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	84
E09 / Natural Circulation Operations / 4						X	EA2.2	Ability to determine and interpret the following as they apply to the (Natural Circulation Cooldown): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	4.0	85
037 / Steam Generator Tube Leak / 3				X			AK3.02	Knowledge of the reasons for the following responses as they apply to the Steam Generator Tube Leak: Comparison of makeup flow and letdown flow for various modes of operation	3.1	57
051 / Loss of Condenser Vacuum / 4					X		AA1.04	Ability to operate and/or monitor the following as they apply to the Loss of Condenser Vacuum: Rod position	2.5	58
028 / Pressurizer Level Control Malfunction / 2					X		AA1.08	Ability to operate and/or monitor the following as they apply to the Pressurizer Level Control Malfunction: Selection of an alternate PZR level channel if one has failed.	3.7	59
068 / Control Room Evacuation / 8			X				AK2.07	Knowledge of the interrelations between the Control Room Evacuation and the following: ED/G	3.3	60
A01 / Plant Runback / 1					X		AA1.2	Ability to operate and/or monitor the following as they apply to the (Plant Runback): Operating behavior characteristics of the facility.	3.2	61
A03 / Loss of NNI-Y / 7				X			AK3.2	Knowledge of the reasons for the following responses as they apply to the (Loss of NNI-Y): Normal, abnormal and emergency operating procedures associated with (Loss of NNI-Y).	3.0	62
A04 / Turbine Trip / 4			X				AK2.2	Knowledge of the interrelations between the (Turbine Trip) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	3.3	63

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Form ES-401-2

NRC Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
E03 / Inadequate Subcooling Margin / 4			X				EK2.2	Knowledge of the interrelations between the (Inadequate Subcooling Margin) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	4.3	64
E09 / Natural Circulation Operations / 4				X			EK3.3	Knowledge of the reasons for the following responses as they apply to the (Natural Circulation Cooldown): Manipulation of controls required to obtain desired operating results during abnormal and emergency situations.	3.8	65
K/A Category Point Total:	0/2	0	3	3	3	0/2	Group Point Total:			9/4

TMI Unit 1
NRC Written Examination Outline
Plant Systems – Tier 2 Group 1

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
010 Pressurizer Pressure Control									X			A2.02	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: Spray valve failures	3.9	86
012 Reactor Protection	X											2.1.33	Conduct of Operations: Ability to recognize system operating parameters which are entry-level conditions for technical specifications.	4.0	87
026 Containment Spray	X											2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.8	88
062 AC Electrical Distribution									X			A2.12	Ability to (a) predict the impacts of the following malfunctions or operations on the AC distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Restoration of power to a system with a fault on it	3.6	89
103 Containment	X											2.1.27	Conduct of Operations: Knowledge of system purpose and or function.	2.9	90
003 Reactor Coolant Pump							XX					K6.04	Knowledge of the effect of a loss or malfunction on the following will have on the RCPS: Containment isolation valves affecting RCP operation	2.8	1
004 Chemical and Volume Control		X										K1.05	Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the following systems: CRDS operation in automatic mode control	2.7	2
005 Residual Heat Removal							X					K6.03	Knowledge of the effect of a loss or malfunction on the following will have on the RHRS: RHR heat exchanger	2.5	3
006 Emergency Core Cooling											X	A4.05	Ability to manually operate and/or monitor in the control room: Transfer of ECCS flow paths prior to recirculation	3.9	4
007 Pressurizer Relief/Quench Tank				X								K3.01	Knowledge of the effect that a loss or malfunction of the PRTS will have on the following: Containment	3.3	5
008 Component Cooling Water	X											2.1.2	Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation.	3.0	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	4.1	7

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NRC Written Examination Outline
Plant Systems – Tier 2 Group 1

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
010 Pressurizer Pressure Control							X					K6.01	Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: Pressure detection systems	2.7	8
012 Reactor Protection							X					K6.10	Knowledge of the effect of a loss or malfunction of the following will have on the RPS: Permissive circuits	3.3	9
013 Engineered Safety Features Actuation			X									K2.01	Knowledge of bus power supplies to the following: ESFAS/safeguards equipment control	3.6	10
013 Engineered Safety Features Actuation	X											2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.4	11
022 Containment Cooling										X		A3.01	Ability to monitor automatic operation of the CCS, including: Initiation of safeguards mode of operation	4.1	12
012 Reactor Protection	X											2.1.27	Conduct of Operations: Knowledge of system purpose and or function.	2.8	13
026 Containment Spray											X	A4.01	Ability to manually operate and/or monitor in the control room: CSS controls	4.5	14
026 Containment Spray				X								K3.01	Knowledge of the effect that a loss or malfunction of the CSS will have on the following: CCS	3.9	15
039 Main and Reheat Steam								X				A1.06	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MRSS controls including: Main steam pressure	3.0	16
059 Main Feedwater									X			A2.07	Ability to (a) predict the impacts of the following malfunctions or operations on the MFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Tripping of MFW pump turbine	3.0	17
059 Main Feedwater				X								K3.02	Knowledge of the effect that a loss or malfunction of the MFW will have on the following: AFW system	3.6	18
061 Auxiliary/Emergency Feedwater							X					K6.02	Knowledge of the effect of a loss or malfunction of the following will have on the AFW components: Pumps	2.6	19
062 AC Electrical Distribution										X		A3.01	Ability to monitor automatic operation of the AC distribution system, including: Vital AC bus amperage	3.0	20
063 DC Electrical Distribution										X		A3.01	Ability to monitor automatic operation of the DC electrical system, including: Meters, annunciators, dials, recorders, and indicating lights	2.7	21

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System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
064 Emergency Diesel Generator								X				A1.03	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ED/G system controls including: Operating voltages, currents, and temperatures	3.2	22
073 Process Radiation Monitoring									X			A2.02	Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Detector failure	2.7	23
006 Emergency Core Cooling		X										K1.05	Knowledge of the physical connections and/or cause-effect relationships between the ECCS system and the following systems: RCP seal injection and return	2.8	24
076 Service Water	X											2.1.2	Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation.	3.0	25
078 Instrument Air		X										K1.04	Knowledge of the physical connections and/or cause-effect relationships between the IAS and the following systems: Cooling water to compressor	2.6	26
103 Containment	X											2.1.33	Conduct of Operations: Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	3.4	27
103 Containment										X		A3.01	Ability to monitor automatic operation of the containment system, including: Containment isolation	3.9	28
K/A Category Point Totals:	5/3	3	1	3	0	0	5	2	3/2	4	2	Group Point Total:			28/5

TMI Unit 1
NRC Written Examination Outline
Plant Systems – Tier 2 Group 2

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
011 Pressurizer Level Control	X											2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.8	91
071 Waste Gas Disposal									X			A2.05	Ability to (a) predict the impacts of the following malfunctions or operations on the Waste Gas Disposal System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Power failure to the ARM and PRM systems.	2.6	92
086 Fire Protection	X											2.1.23	Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.0	93
001 Control Rod Drive						X						K5.33	Knowledge of the following operational implications as they apply to the CRDS: Xenon production and removal process	3.2	29
011 Pressurizer Level Control						X						K5.12	Knowledge of the operational implications of the following concepts as they apply to the PZR LCS: Criteria and purpose of PZR level program	2.7	30
017 In-core Temperature Monitor					X							K4.01	Knowledge of ITM system design feature(s) and/or interlock(s) which provide for the following: Input to subcooling monitors	3.4	31
041 Steam Dump System and Turbine Bypass Control			X									K2.01	Knowledge of bus power supplies to the following: ICS, normal and alternate power supply	2.8	32
029 Containment Purge					X							K4.02	Knowledge of design feature(s) and/or interlock(s) which provide for the following: Negative pressure in containment	2.9	33
033 Spent Fuel Pool Cooling									X			A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System; and (b) based those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Abnormal Spent Fuel Pool water level or loss of water level.	3.1	34
045 Main Turbine Generator											X	A4.01	Ability to manually operate and/or monitor in the control room: Turbine valve indicators (throttle, governor, control, stop, intercept), alarms, and annunciators.	3.1	35
071 Waste Gas Disposal										X		A3.02	Ability to monitor automatic operation of the Waste Gas Disposal System including: Pressure-regulating system for the waste gas vent header.	2.8	36

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NRC Written Examination Outline
Plant Systems – Tier 2 Group 2

Form ES-401-2

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
072 Area Radiation Monitoring				X								K3.02	Knowledge of the effect that a loss or malfunction of the ARM system will have on the following: Fuel handling operations	3.1	37
086 Fire Protection											X	A4.06	Ability to manually operate and/or monitor in the control room: Halon system	3.2	38
K/A Category Point Totals:	0/2	0	1	1	2	2	0	0	1/1	1	2	Group Point Total:			10/3

Facility:	TMI Unit 1		Date of Exam:		4/22/2007		
Category	K/A #	Topic	RO		SRO-Only		
			IR	Q#	IR	Q#	
1. Conduct of Operations	2.1.10	Knowledge of conditions and limitations in the facility license.			3.9	94	
	2.1.32	Ability to explain and apply all system limits and precautions.			3.8	95	
	2.1.17	Ability to make accurate, clear and concise verbal reports.	3.5	66			
	2.1.3	Knowledge of shift turnover practices.	3.0	67			
	Subtotal			2		2	
2. Equipment Control	2.2.28	Knowledge of new and spent fuel movement procedures.			3.5	96	
	2.2.33	Knowledge of control rod programming.			2.9	97	
	2.2.34	Knowledge of the process for determining the internal and external effects on core reactivity.	2.8	68			
	2.2.26	Knowledge of refueling administrative requirements.	2.5	69			
	Subtotal			2		2	
3. Radiation Control	2.3.2	Knowledge of facility ALARA program.			2.9	98	
	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements			3.0	99	
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	70			
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.9	71			
	2.3.11	Ability to control radiation releases.	2.7	72			
	Subtotal			3		2	
4. Emergency Procedures / Plan	2.4.41	Knowledge of the emergency action level thresholds and classifications.			4.1	100	
	2.4.14	Knowledge of general guidelines for EOP flowchart use.	3.0	73			
	2.4.39	Knowledge of the RO's responsibilities in emergency plan implementation.	3.3	74			
	2.4.13	Knowledge of crew roles and responsibilities during EOP flowchart use.	3.3	75			
	Subtotal			3		1	
Tier 3 Point Total				10		7	

Tier / Group	Randomly Selected K/A	Reason for Rejection
2 / 1	025 G2.1.27	System does not exist at TMI. Reselected system 012.
1 / 1	015 AA2.11	Facility does not perform function for the selected topic. Randomly selected AA2.01 for same topic.
1 / 1	055 EK1.01	Excessive overlap with Audit Examination. Impossible to develop significantly different question. Randomly selected EK2.02 for same topic
1 / 2	037 AK3.02	Facility does not have air ejectors, and Off-Gas monitors do not have a reset function. Randomly selected AK3.03
2 / 1	004 K1.10	No pneumatic valves in DHR system at facility. Randomly selected K1.05 for topic area
2 / 1	026 A4.05	Facility does not have Containment Spray Reset switches. Randomly selected A4.01
2 / 2	071 A2.03	Waste Gas system has no rupture discs at facility. Randomly selected A2.08 for the same topic.
2 / 2	033 A2.01	No procedural support for Inadequate SDM in SFP. Randomly selected A2.03 for the same topic.
2 / 2	071 A3.01	Facility design is such that there is no overlap between WGDS and HRPS. Randomly selected A3.02 for the same topic.
2 / 2	071 A2.08	Meteorological changes are not referenced in facility procedures for the system. Randomly selected an A2 (A2.05) that has facility application and is not RMS-related.
2 / 1	073 K1.01	Many RMS-related questions on this examination. Randomly selected a K1 in a system not selected twice in T2/G1: 006 K1.05.
2 / 2	072 K3.01	K/A yields very similar question to Question 23. Selected the only other 072 K3 (K3.02).
2 / 1	078 K1.03	Facility has no normal IA alignment to the containment. Randomly selected K1.04.
2 / 2	027 K2.01	A valid question could not be developed for the facility equivalent fan. Randomly selected K2 >2.5 from a system not covered in T2G2 (041 K2.01).
1 / 2	060 AA1.02	K/A ties in to other RMS-related questions. Chief Examiner suggested a K/A change. Randomly selected 028 AA1.08.
3	2.1.27	Chief Examiner suggested a K/A change due to over-sampling. Randomly selected a 2.1 K/A from those not used on the examination (2.1.3).
2 / 1	2.1.30	A valid SRO-level question could not be developed for this K/A. Chief Examiner suggested a K/A change. Randomly selected 2.1.33.

Facility: **TMI Unit 1**Date of Examination: **April 2007**Examination Level (circle one): **RO** / SROOperating Test Number: **NRC**

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N	Perform a batch calculation in accordance with OP 1103-4, SOLUBLE BORON CONCENTRATION CONTROL, Enclosure 1. 2.1.25 (2.8): Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data.
Conduct of Operations	M, S	Perform a transient RCS leak rate calculation in accordance with OS-24, CONDUCT OF OPERATIONS DURING ABNORMAL AND EMERGENCY EVENTS, ATTACHMENT F. 2.1.19 (3.0): Ability to use plant computer to obtain and evaluate parametric information on system or component status.
Equipment Control	N, S	Perform "Shiftly Checks" of Decay Heat Removal Capability in accordance with Surveillance Procedure 1301-1, SHIFT AND DAILY CHECKS, Data Sheet 3 – Section C.2. 2.2.12 (3.0): Knowledge of surveillance procedures.
Radiation Control	N	Given a set of conditions, determine and apply the facility dose limits. 2.3.1 (2.6): Knowledge of 10 CFR: 20 and related facility radiation control requirements.
Emergency Plan		N/A - not selected for RO

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.

*Type Codes & Criteria:

- (C)ontrol room
- (D)irect from bank (≤ 3 for ROs; \leq for SROs & RO retakes)
- (N)ew or (M)odified from bank (> 1)
- (P)revious 2 exams (≤ 1 ; randomly selected)
- (S)imulator

THREE MILE ISLAND 2007 NRC RO EXAMINATION

CONDUCT OF OPERATIONS (A1-1): Perform a batch calculation in accordance with OP 1103-4, SOLUBLE BORON CONCENTRATION CONTROL, Enclosure 1. Given a situation and conditions, determine the applicable section of 1103-4, Enclosure 1 and utilize the referenced figures and tables to perform a batch calculation. New JPM. RO/SRO Common.

CONDUCT OF OPERATIONS (A1-2): Perform a transient RCS leak rate calculation in accordance with OS-24, CONDUCT OF OPERATIONS DURING ABNORMAL AND EMERGENCY EVENTS, ATTACHMENT F. Given a frozen simulator with an RCS leak in progress, use the plant computer to extract the necessary data and then calculate the leak rate. The calculation is RO/SRO Common. Modify Bank JPM 11205057 by changing the initial conditions and requiring the applicant to retrieve the data from the plant computer on a frozen simulator.

EQUIPMENT CONTROL (A2): Perform "Shiftly Checks" of Decay Heat (DH) Removal Capability in accordance with Surveillance Procedure 1301-1, SHIFT AND DAILY CHECKS, Data Sheet 3 – Section C.2. Evaluate DH Pump performance, system alignment and the adequacy of support instrumentation with the simulator in cold shutdown on DH cooling; identifying all (two, or more) errors. RO only. New JPM

RADIATION CONTROL (A3): Given an emergency situation and survey maps, determine the area dose rate near a specified plant component and apply the applicable facility limits to determine the stay time for the situation. RO/SRO Common. New JPM.

Facility:	TMI Unit 1	Date of Examination:	April 2007
Exam Level (circle one):	RO / SRO(I) / SRO (U)	Operating Test No.:	NRC
Control Room Systems® (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)			
System / JPM Title		Type Code*	Safety Function
a.	Take corrective action for a Control Rod Drive Sequence Fault in accordance with (IAW) OP-TM-MAP-G0202. System: 001	M, E, L	1
b.	Take corrective action for a low pressure injection failure during a large break LOCA IAW OP-TM-211-901. System: 006	D, A, E	2
c.	Respond to an RCS narrow range pressure instrument failure IAW alarm response procedure MAP G-1-6. System: 010	M, A	3
d.	Respond to an RCP Seal problem IAW AOP-040. System: 003	N, E, A	4P
e.	Cross-connect Secondary River Water to Nuclear River Water IAW EP 1202-38. (RO Only) System: 076	D	4S
f.	Return RB Emergency Cooling to standby following a manual actuation IAW OP-TM-534-901. System: 022	P, D	5
g.	Energize a Vital AC Bus during a loss of off-site power using the SBO Diesel IAW AOP-020. System: 062	M (P), A, E	6
h.	Respond to an alarm on Control Room RMS Channel RM-A1 IAW MAP C, C-1-1. System: 073	M	7
In-Plant Systems® (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)			
i.	Reset the steam-driven EFW Pump overspeed trip IAW EOP-10, GUIDE 16.1. System: 061	P, E	4S

j. Initiate emergency boration IAW EOP-020. System: APE 068	M, R, E	8
k. Manually operate RR-V-6, Reactor Building Emergency Cooler Pressure Control Valve, IAW OP-1104-38. System: 022	D	5
@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 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	$\leq 9 / \leq 8 / \leq 4$	
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$	
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$	
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$	
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)	
(R)CA	$\geq 1 / \geq 1 / \geq 1$	
(S)imulator		

THREE MILE ISLAND 301-2 JPM SUMMARY STATEMENTS

- a. Take corrective action for a Control Rod Drive Sequence Fault in accordance with (IAW) OP-TM-MAP-G0202. Group 7 rods withdraw out-of-sequence when power is being raised from < 5% in preparation for synchronizing the main turbine generator. The applicant will respond IAW OP-TM-G0202, CRD SEQUENCE FAULT, and correct the overlap problem IAW OP-TM-622-412, RECOVERING FROM A SEQUENCE INHIBIT CAUSED BY EXCESSIVE OVERLAP. Modify Bank JPM 11.2.05.159 by changing the initial conditions and therefore the procedure path. To be performed by: RO, SROI, SROU. Failure to properly perform the task will result in a violation of technical specifications and operation outside of accident analysis assumptions.
- b. Take corrective action for a low pressure injection failure IAW OP-TM-EOP-006. Applicant will assume the watch with directions to perform EOP-006, LOCA COOLDOWN. DH-P-1B has failed to start, requiring alternative actions. The alternate path is via OP-TM-211-901, EMERGENCY INJECTION. Bank JPM 11.2.05.195. To be performed by: RO, SROI, SROU. Failure to properly perform the task will result in the possibility that all LPI flow is out the break.

- c. Respond to an RCS narrow range pressure instrument failure IAW alarm response procedure MAP G-1-6. Shortly after assuming the watch, an RCS narrow range pressure instrument fails HI and SASS fails to block the signal. The applicant will respond IAW the alarm response procedure to place equipment in the proper alignment/position. Modified Bank JPM TQ-TM-104-220-J001 to prevent the PZR Spray Valve from closing in MANUAL. The alternate path is to close the PZR Spray Valve isolation valve. To be performed by: RO, SROI. Failure to properly perform the task will result in unnecessarily creating saturated conditions in the RCS.
- d. Respond to an RCP Seal problem IAW AOP-040. Shortly after assuming the watch, an RCP #1 Seal problem will develop, requiring entry into AOP-040, RCP #1 SEAL FAILURE. The alternate path is a requirement to initiate a reactor trip, stop the affected pump and close the return isolation valve. This JPM is identified as NEW because the JPM was removed from the facility bank prior to 2005 and was not based on AOP-040. To be performed by: RO, SROI, SROU. Failure to properly perform the task could result in a LOCA caused by catastrophic seal failure.
- e. Cross-connect Secondary River (SR) Water to Nuclear River (NR) Water IAW EP 1202-38. The only available NR Pump will trip shortly after the applicant assumes the watch with the unit shutdown. SR is then cross-connected to NR IAW EP 1202-38, NUCLEAR SERVICES RIVER WATER FAILURE. Bank JPM 11.2.05.150. To be performed by: RO Only. Failure to properly perform the task will result in loss of cooling water to emergency safeguards equipment.
- f. Return RB Emergency Cooling to standby IAW OP-TM-534-901, RB EMERGENCY COOLING OPERATIONS, following a manual actuation. The applicant assumes the watch with RB Emergency Cooling in service due to a small steam leak that has been isolated and is directed to restore it to ES Standby alignment. Randomly selected repeat from the 2003 NRC Exam (B.1.f). To be performed by: RO, SROI. Failure to properly perform the task could result in inadequate flow to Reactor Building coolers and possible operation outside of accident analysis assumptions.
- g. Energize a Vital AC Bus during a loss of off-site power using the SBO Diesel IAW AOP-020. The applicant assumes the watch after a loss of off-site power and AOP-020, LOSS OF STATION POWER, just entered. The alternate path is to energize ID or 1E Vital Bus IAW OP-TM-864-901, SBO DIESEL GENERATOR (EG-Y-4) OPERATIONS. Randomly selected repeat from the 2005 NRC Exam (JPM F). The JPM will be modified in that it will begin in AOP-020 vice OP-TM-864-901 and a different bus will be re-energized. To be performed by: RO, SROI. Failure to properly perform the task will result in loss of DC power to the respective bus or a station blackout if power is lost to the available bus.
- h. Respond to an alarm for RMS Channel RM-A1, Control Room Monitor, IAW MAP C, C-1-1. Shortly after the applicant assumes the watch, alarm C-1-1 (HI ALARM) will actuate. Failure of the interlock will require alignment of components IAW OP-TM-826-901, CONTROL BUILDING VENTILATION SYSTEM RADIOLOGICAL RESPONSE OPERATIONS. The task is similar to Bank JPM TQ-TM-104-826-J001 but will be modified to start from an alarm condition; with failed interlock actuations. To be performed by: RO, SROI. Failure to properly perform the task will result in possible radiation intrusion into the control room environment.

- i. Reset the steam-driven EFW Pump overspeed trip IAW OP-TM-EOP-010, Guide 16.1, EFW FAILURE. Randomly selected repeat from the 2003 NRC Exam (B.2.c). To be performed by: RO, SROI. Failure to properly perform the task will result in loss of all feedwater flow when the operating pump fails.
- j. Initiate emergency boration IAW EOP-020, COOLDOWN FROM OUTSIDE OF CONTROL ROOM, Step 3.1.19. Perform the steps necessary to initiate boration from outside the control room. Modify Bank JPM TQ-TM-105-211-J001 to have the applicant perform all sub-steps rather than opening just one manual valve (MU-V-51). To be performed by: RO, SROI, SROU. Failure to properly perform the task will result in inadequate SDM during the cooldown.
- k. Manually operate RR-V-6, Reactor Building Emergency Cooler Pressure Control Valve, IAW OP-1104-38. Applicant is directed to raise Reactor Building Emergency Cooling coil pressure with a LOCA in progress. Bank JPM TQ-TM-105-534-J001. To be performed by: RO, SROI, SROU. Failure to properly perform the task could result in an uncontrolled leakage path from the Reactor Building atmosphere to the cooling system to the local environment.

Facility: TMI Unit 1 Examination Level (circle one): RO / SRO	Date of Examination: April 2007 Operating Test Number: NRC	
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N	Perform a batch calculation in accordance with OP 1103-4, SOLUBLE BORON CONCENTRATION CONTROL, Enclosure 1. 2.1.25 (2.8/3.1): Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data.
Conduct of Operations	M, S	Perform a transient RCS leak rate calculation in accordance with OS-24, CONDUCT OF OPERATIONS DURING ABNORMAL AND EMERGENCY EVENTS, ATTACHMENT F, and apply the Technical Specification/procedural requirements to the calculation. 2.1.12 (4.0): Ability to apply technical specifications for a system.
Equipment Control	N	Evaluate a proposed temporary procedure change. 2.2.6 (3.3): Knowledge of the process for making changes in procedures as described in the safety analysis report.
Radiation Control	N	Given a set of conditions, determine and apply the facility dose limits. 2.3.1 (2.6/3.0): Knowledge of 10 CFR: 20 and related facility radiation control requirements.
Emergency Plan	P/M	Given a set of conditions, determine the Emergency Action Level (EAL) and make a Protective Action Recommendation (PAR). 2.4.44 (4.0): 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, when 5 are required.		
*Type Codes & Criteria: <ul style="list-style-type: none"> (C)ontrol room (D)irect from bank (≤ 3 for ROs; \leq for SROs & RO retakes) (N)ew or (M)odified from bank (> 1) (P)revious 2 exams (≤ 1; randomly selected) (S)imulator 		

THREE MILE ISLAND 2007 NRC SRO EXAMINATION

CONDUCT OF OPERATIONS (A1-1): Perform a batch calculation in accordance with 1103-4, SOLUBLE BORON CONCENTRATION CONTROL, Enclosure 1. Given a situation and conditions, determine the applicable section of OP 1103-4, Enclosure 1 and utilize the referenced figures and tables to perform a batch calculation. New JPM. RO/SRO Common.

CONDUCT OF OPERATIONS (A1-2): Perform a transient RCS leak rate calculation in accordance with OS-24, CONDUCT OF OPERATIONS DURING ABNORMAL AND EMERGENCY EVENTS, ATTACHMENT F, and apply the Technical Specification/procedural requirements to the calculation. Given a frozen simulator with an RCS leak in progress, use the plant computer to extract the necessary data and then calculate the leak rate. The calculation is RO/SRO Common. The SRO applicants will apply the Technical Specification/procedural requirements based on their calculations. Modify Bank JPM 11205057 by changing the initial conditions, requiring the applicant to retrieve the data from the plant computer on a frozen simulator and having the SRO applicant determine and apply the facility requirements.

EQUIPMENT CONTROL (A2): Evaluate a proposed temporary procedure change. Apply facility requirements to the review of a temporary procedure change containing two (or more) administrative and/or technical errors. New JPM. SRO only.

RADIATION CONTROL (A3): Given an emergency situation and survey maps, determine the area dose rate near a specified plant component and apply the applicable facility limits to determine the stay time for the situation. RO/SRO Common. New JPM.

EMERGENCY PLAN (A4): Given a set of conditions, determine the Emergency Action Level (EAL) and make a Protective Action Recommendation (PAR). Randomly selected task from one of the previous two NRC examinations. Modify by changing the conditions. SRO only.

Facility:	Three Mile Island	Scenario No.:	1	Op Test No.:	NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions:	<ul style="list-style-type: none"> • 100% power, MOC. • EF-P-2B is OOS for bearing replacement. • DR-P-1A is running for effluent flow 				
Turnover:	Maintain 100% power operations.				
Critical Tasks:	<ul style="list-style-type: none"> • Initiate HPI Cooling (CT-14) • Initiate HPI (CT-2) 				
Event No.	Malf. No.	Event Type*	Event Description		
1	RW04A	CRS	Decay Heat River Water Pump DR-P-1A trips (TS)		
2		CRS	NLO Reports an excessive oil leak from Emergency Feedwater Pump EF-P-1 (TS).		
3	MS01D	I CRS I ARO	Turbine Header Pressure instrument fails high slowly		
4	CC04A	C CRS C URO	Intermediate Closed Cooling Water Pump IC-P-1A trips and IC-P-1B fails to auto start		
5	MS19A	N CRS N ARO R URO	Steam Leak in the Turbine Building		
6	FW-15A FW-15B TC07B	M CRS M URO M ARO	Feedwater Pump 1A trip Feedwater Pump 1B trip Turbine stop valve fails open		
7	FW17 FW18A	C CRS C ARO	Emergency Feedwater Pump EF-P-1 trips on start Emergency Feedwater Pump EF-P-2A does not start. (CT-14)		
8	MU08B	C CRS C URO	High Pressure Injection Valve (HPI) MU-V-16B fails to open B ESAS Manual Actuation Failure (CT-2)		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Facility:	Three Mile Island	Scenario No.:	2	Op Test No.:	NRC
Examiners:			Operators:		
<div>Initial Conditions:</div> <ul style="list-style-type: none"> Reactor Startup is in Progress NI-12 is OOS due to a detector failure 					
Turnover:	Take the Reactor Critical				
Critical Tasks:	<ul style="list-style-type: none"> Initiate HPI (CT-2) Trip all RCPs (CT-1) Reduce Steaming/Isolate Affected SGs (CT-22) Limit Uncontrolled Radiation Release (CT-21) 				
Event No.	Malf. No.	Event Type*	Event Description		
1 2	RM0322	CRS N CRS R URO N ARO	Reactor Building Hi Range Radiation Monitor Failure (TS) Reactor Startup		
3	NI37A	URO CRS	Premature Criticality		
4	RD03A	M CRS M URO M ARO	Continuous Rod Withdrawal		
5	TH15A	CRS	OTSG Tube Leak in OTSG A (TS)		
6	TH16A	C CRS C URO C ARO	OTSG Tube Rupture in A OTSG requiring HPI initiation		
7	MU09	C CRS C URO	High Capacity Makeup Flow Valve MU-V-217 Fails to open		
8	CC02B	C CRS C URO	Decay Heat Closed Cooling Water Pump Trips on ESAS Actuation		
9	TH17A	C CRS C URO C ARO	OTSG Tube Rupture in A OTSG resulting in loss of subcooling margin (CT-1, CT-22)		
10	ES01A ES01B	I CRS I URO	Both Trains of HPI Fail to Actuate at 1600 psig (CT-2)		
11	FW45A	C CRS C ARO	Emergency Feedwater Pump Steam Supply Valve MS-V-13A Fails Open. (CT-21)		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Facility:	Three Mile Island	Scenario No.:	3	Op Test No.:	NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions:	<ul style="list-style-type: none"> 85% power, MOC Power Escalation Following a trip and maintenance outage MU-P-1B OOS 				
Turnover:	Raise Power to 100%.				
Critical Tasks:	<ul style="list-style-type: none"> Trip all RCPs (CT-1) Establish FW Flow and Feed SGs (CT-10) 				
Event No.	Malf. No.	Event Type*	Event Description		
1	TH08	C CRS C URO	Power Operated Relief Valve (PORV) Block Valve RC-V-2 Breaker Trips (TS)		
2	RD0216	C CRS C URO	Stuck Rod in Group 7 (TS)		
3	TH13D	N CRS R URO N URO	Reactor Coolant Pump RC-P-1D High Vibration		
4		C CRS C ARO C URO	Feedwater Flow Fails to re-ratio after securing RC-P-1D		
5	TH06	M CRS M URO M ARO	An RCS leak occurs requiring a Reactor Trip		
6	RW010B	C CRS C URO	Reactor Building Emergency Cooling Pump RR-P-1B does not start on ESAS actuation		
7		C CRS C URO	RC-P-1A does not trip when control switch is rotated to the stop position (CT-1)		
8		I CRS I ARO	Emergency Feedwater Valves to the A OTSG EF-V-30A and EF-V-30D do not control in automatic due to a level setpoint failure (CT-10)		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Facility:		TMI		Date of Exam:		April 2007		Operating Test No.:		NRC							
A P P L I C A N T	E V E N T T Y P E	Scenarios															
		1			2			3			4			T O T A L	M I N I M U M (*) R I U		
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
SRO15	RX		5											1	1	1	0
	NOR				1									1	1	1	1
	I/C		4,8		6,7 8,9 10, 11									8	4	4	2
	MAJ		6		4									2	2	2	1
	TS				1,5									2	0	2	2
RO1	RX					1								1	1	1	0
	NOR			5										1	1	1	1
	I/C			3,7		6,7 8,9 10								7	4	4	2
	MAJ			6		4								2	2	2	1
	TS														0	2	2
SROU	RX														1	1	0
	NOR	5												1	1	1	1
	I/C	3,4, 7,8												4	4	4	2
	MAJ	6												1	2	2	1
	TS	1,2												2	0	2	2

Instructions:

- Circle the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must service in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must do one scenario, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position.
- Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
- Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.
- SRO Instant and Upgrade candidates "TOTALs" reflect the ATC and SRO positions only.

Facility:		TMI		Date of Exam:		April 2007		Operating Test No.:		NRC							
A P P L I C A N T	E V E N T T Y P E	Scenarios															
		1			2			3			4			T O T A L	M I N I M U M (*) R I U		
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
SRO16	RX							3					1	1	1	0	
	NOR				1								1	1	1	1	
	I/C				6,7 8,9 10, 11			1,2, 4,6, 7,					11	4	4	2	
	MAJ				4			5					2	2	2	1	
	TS				1,5								2	0	2	2	
RO2	RX		5										1	1	1	0	
	NOR							3					1	1	1	1	
	I/C		4,8					4, 8					4	4	4	2	
	MAJ		6					5					2	2	2	1	
	TS													0	2	2	
SRO11	RX				1								1	1	1	0	
	NOR	5					3						1	1	1	1	
	I/C	3,4, 7,8			6,7 8,9 ,10		1,4, 6,7, 8						9	4	4	2	
	MAJ	6			4		5						2	2	2	1	
	TS	1,2					1,2						2	0	2	2	

Instructions:

1. Circle the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must service in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must do one scenario, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.
4. SRO Instant and Upgrade candidates "TOTALs" reflect the ATC and SRO positions only.

Facility:		TMI		Date of Exam:		April 2007		Operating Test No.:		NRC							
A P P L I C A N T	E V E N T T Y P E	Scenarios												T O T A L	R	M I N I M U M (*) I	U
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
SRO17	RX							3						1	1	1	0
	NOR				1									1	1	1	1
	I/C				6,7 8,9 10, 11			1,2, 4,6, 7,						11	4	4	2
	MAJ				4			5						2	2	2	1
	TS				1,3									2	0	2	2
RO3	RX		5											1	1	1	0
	NOR								3					1	1	1	1
	I/C		4,8						4, 8					4	4	4	2
	MAJ		6						5					2	2	2	1
	TS														0	2	2
SRO12	RX				1									1	1	1	0
	NOR	5						3						1	1	1	1
	I/C	3,4, 7,8				6,7 8,9 ,10		1,4, 6,7, 8						9	4	4	2
	MAJ	6				4		5						2	2	2	1
	TS	1,2						1,2						2	0	2	2

Instructions:

1. Circle the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must service in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must do one scenario, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.
4. SRO Instant and Upgrade candidates "TOTALs" reflect the ATC and SRO positions only.

Facility:		TMI		Date of Exam:		April 2007		Operating Test No.:		NRC							
A P P L I C A N T	E V E N T T Y P E	Scenarios															
		1			2			3			4			T O T A L	M I N I M U M (*) R I U		
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
SRO14	RX		5											1	1	1	0
	NOR				1									1	1	1	1
	I/C		4,8		6,7 8,9 10, 11									8	4	4	2
	MAJ		6		4									2	2	2	1
	TS				1,5									2	0	2	2
SRO13	RX				1									1	1	1	0
	NOR	5												1	1	1	1
	I/C	3,4, 7,8			6,7 8,9 ,10									9	4	4	2
	MAJ	6			4									2	2	2	1
	TS	1,2												2	0	2	2

Instructions:

1. Circle the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must service in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must do one scenario, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.
4. SRO Instant and Upgrade candidates "TOTALs" reflect the ATC and SRO positions only.

Facility: TMI	Date of Examination: 2007	Operating Test No.: NRC														
Competencies	APPLICANTS															
	SRO				RO (ATC)				BOP							
	SCENARIO				SCENARIO				SCENARIO							
	1	2	3	4	1	2	3	4	1	2	3	4				
Interpret/Diagnose Events and Conditions	3,5,6,7,8	2,3,4,5,8	1,2,3,5,7	1,2,5,6	1,3,4,6,8	2,3,4,6,7,8,9	2,3,5,6,7	1,2,3,5,6	3,7	4,8,10,11	4,8	1,4,5				
Comply With and Use Procedures (1)	3,5,6,7	1,3,4,5,8,10	2,3,5	1,2,4,5	1,3,4,8	1,3,6,7,8,9	2,3,5,6,7	1,2,3,5,6	3,5,7	5,8,10,11	4,5,8	1,4,5				
Operate Control Boards (2)	N/A	N/A	N/A	N/A	3,4,5,6,7,8	1,3,5,6,7,8,9	2,3,5,6,7	1,2,4,5,6	3,6,7	10,11	4,5,8	1,4,5				
Communicate and Interact	ALL	ALL	ALL	ALL	1,3,4,5,6,7,8	1,2,3,4,5,6,7,8,9	1,2,3,5,6,7	1,2,3,4,5,6	3,5,6,7	3,5,10,11	4,5,8	1,4,5				
Demonstrate Supervisory Ability (3)	ALL	ALL	ALL	ALL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Comply With and Use Tech. Specs. (3)	1,2	1,5	1,2	1,3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Notes: (1) Includes Technical Specification compliance for an RO. (2) Optional for an SRO-U. (3) Only applicable to SROs.																

Instructions:

Circle the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: _____

NRC Reviewer: _____