Facility: Date of Examination:

Item	Task Description	Initials a	Initials b*	Initials c
1. W R I T T E N	a. Verify that the outline(s) fit(s) the appropriate model per ES-401.	WGO	BP	
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all knowledge and ability categories are appropriately sampled.	WGO	BP	
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.	WGO	BP	
	d. Assess whether the repetition from previous examination outlines is excessive.	WGO	BP	
2. S I M	a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, and major transients.	N/A	N/A	N/A
	b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity; ensure each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s)*, and scenarios will not be repeated over successive days.	N/A	N/A	N/A
	c. To the extent possible, assess whether the outline(s) conform(s) with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D.	N/A	N/A	N/A
3. W / T	a. Verify that: (1) the outline(s) contain(s) the required number of control room and in-plant tasks, (2) no more than 30% of the test materials repeated from the last NRC examination, (3)* no tasks are duplicated from the applicants' audit test(s), and (4) no more than 80% of any operating test is taken directly from the licensee's exam banks.	N/A	N/A	N/A
	b. Verify that: (1) the tasks are distributed among the safety function groupings as specified in ES-301, (2) one task is conducted in a low-power or shutdown condition, (3) [illegible]% of the tasks require the applicant to implement an alternate path procedure, (4) one in-plant task tests the applicant's response to an emergency or abnormal condition, and (5) the in-plant walk-through requires the applicant to enter the RCA.	N/A	N/A	N/A
	c. Verify that the required administrative topics are covered, with emphasis on performance-based activities.	N/A	N/A	N/A
	d. Determine if there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on successive days.	N/A	N/A	N/A
4. G	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam section.	WGO	BP	
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.	WGO	BP	
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	WGO	BP	
	d. Check for duplication and overlap among exam sections.	N/A	N/A	N/A
	e. Check the entire exam for balance of coverage.	WGO	BP	
	f. Assess whether the exam fits the appropriate job level (RO or SRO).	WGO	BP	

	Printed Name / Signature	Date
a. Author	William G. Ogle Jr. / [signature]	4/20/00
b. Facility Reviewer(*)	ROBERT J. PARSELL III / [signature]	4/21/00
c. Chief Examiner	J. Carusone [signature]	5/4/00
d. NRC Supervisor	Richard J. Conte / [signature]	6/28/00

(*) Not applicable for NRC-developed examinations.

draft

AmerGen
A PECO Energy/British Energy Company

AmerGen Energy Company, LLC
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Middletown, PA 17057
Phone: 717-944-7621

'00 APR 24 A10:00

April 21, 2000

5928-00-20170

Mr. John G. Caruso
Division of Reactor Safety
Human Performance and Emergency Preparedness Branch
U. S. Nuclear Regulatory Commission, Region I
475 Allendale Road
King of Prussia, PA 19406-1415

SUBJECT: THREE MILE ISLAND UNIT 1(TMI UNIT 1)
OPERATING LICENSE NO. DPR-50
DOCKET NO. 50-289
SUBMITTAL OF THE REACTOR OPERATOR RE-EXAMINATION AND SUPPORTING REFERENCE MATERIALS

Dear Mr. Caruso,

The purpose of this letter is to submit materials required for a Reactor Operator re-examination for your review and approval. The examination materials are being provided to support administration of the Reactor Operator licensing re-examination at the Three Mile Island Unit 1 facility during the week of June 30, 2000. It is requested that the included materials be withheld from public disclosure until after the examination is complete.

Pursuant to the requirements of ES 201, Section C.1, the written examination sampling plan, examination outline question checklist, and 25 sample questions were prepared in accordance with the guidelines of ES-401.

The designated point of contact for information regarding the preparation and administration of these examinations is Mr.William G. Ogle. He can be contacted at 717-948-2020.

Very truly yours,

John B. Cotton
Vice President, TMI Unit 1

JBC/vlk

cc **w/o enclosures**:
Administrator, Region I - Hubert J. Miller
TMI Senior Resident Inspector - Wayne L. Schmidt
Chief Human Performance and Emergency Preparedness Branch Division of Reactor Safety - Richard J. Conte

File 00003

William Ogle
Lead Instructor Simulator Training
Three Mile Island
Amergen Energy, LLC
Middletown, PA 17057

* The facility developed the sample plan for the June 30, 2000 reexamination for Frank Waple in accordance with ES 401 Attachment 1.

William Ogle 3/14/00
Date

* Per Telecom with Bill Ogle on 5/12/00 there no substitutions made to the random & Systematic method used to develop the outline. John B Crum 5/12/00

Facility: TMI Date of Exam: 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	2	2	4				4	3			1	16
	2	3	2	4				3	4			1	17
	3	0	0	1				0	1			1	3
	Tier Totals	5	4	9				7	8			3	36
2. Plant Systems	1	2	1	4	1	3	1	3	3	1	2	2	23
	2	3	1	2	2	0	1	1	4	2	2	2	20
	3	2	0	1	1	1	0	0	1	1	1	0	8
	Tier Totals	7	2	7	4	4	2	4	8	4	5	4	51

3. Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	13
	4	3	3	3	

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. Actual point totals must match those specified in the table.
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 RO 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 PWR RO Examination OutlineForm ES-401-4
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function Question Number	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1 Q# 001			04				Knowledge of the reasons for the following responses as they apply to the Inoperable/Stuck Control Rod: Tech-Spec limits for inoperable rods	3.4	1
000015/17 RCP Malfunctions / 4 Q# 002				13			Ability to operate and/or monitor the following as they apply to Reactor Coolant Pump Malfunctions: Reactor power level indicators	3.4	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4 Q# 003	2						Knowledge of the operational implications of the following concepts as they apply to Natural Circulation Cooldown: Normal, abnormal and emergency operating procedures associated with Natural Circulation Cooldown	3.7	1
000024 Emergency Boration / 1 Q# 004	02						Knowledge of the operational implications of the following concepts as they apply to Emergency Boration: Relationship between boron addition and reactor power	3.6	1
000026 Loss of Component Cooling Water / 8 Q# 005				04			Ability to operate and/or monitor the following as they apply to the Loss of Component Cooling Water: CRDM high-temperature alarm system	2.7	1
000027 Pressurizer Pressure Control System Malfunction / 3 Q# 006				05			Ability to operate and/or monitor the following as they apply to the Pressurizer Pressure Control Malfunctions: Transfer of heaters to backup power supply	3.3	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4 Q# 007			3				Knowledge of the reasons for the following responses as they apply to the Excessive Heat Transfer: Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations	4.2	1
~~CE/A11; W/E08 RCS Overcooling - PTS / 4~~									
000051 Loss of Condenser Vacuum / 4 Q# 008					02		Ability to determine and interpret the following as they apply to the Loss of Condenser Vacuum: Conditions requiring reactor and/or turbine trip	3.9	1
000055 Station Blackout / 6 Q# 009						4. 31	Knowledge of annunciators alarms and indications, and use of the response instructions	3.3	1
~~000057 Loss of Vital AC Elec. Inst. Bus / 6~~									
000062 Loss of Nuclear Service Water / 4 Q# 010					02		Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: The cause of possible SWS loss	2.9	1
000067 Plant Fire On-site / 9 Q# 011			04				Knowledge of the reasons for the following responses as they apply to the Plant Fire on Site: Actions contained in EOP for plant fire on site	3.3	1
000068 (BW/A06) Control Room Evac. / 8 Q# 012		03					Knowledge of the interrelations between the Control Room Evacuation and the following: Controllers and positioners	2.9	1
000069 (W/E14) Loss of CTMT Integrity / 5 Q# 013				01			Ability to operate and/or monitor the following as they apply to the Loss of Containment Integrity: Isolation valves, dampers, and electropneumatic devices	3.5	1
000074 (W/E06&E07) Inad. Core Cooling / 4 Q# 014					04		Ability to determine or interpret the following as they apply to a Inadequate Core Cooling: Relationship between RCS temperature and main steam pressure	3.7	1
~~BW/E03 Inadequate Subcooling Margin / 4~~									
000076 High Reactor Coolant Activity / 9 Q# 015			06				Knowledge of the reasons for the following responses as they apply to the High Reactor Coolant Activity: Actions contained in EOP for high reactor coolant activity	3.2	1
BW/A02&A03 Loss of NNI-X/Y / 7 Q# 016		2					Knowledge of the interrelations between the Loss of NNI-X/Y 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	3.8	1
K/A Category Totals:	2	2	4	4	3	1	Group Point Total:		16

ES-401 PWR RO Examination OutlineForm ES-401-4
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function Question Number	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
~~000001 Continuous Rod Withdrawal / 1~~									
000003 Dropped Control Rod / 1 Q# 017		05					Knowledge of the interrelations between the Dropped Control Rod and the following: Control rod drive power supplies and logic circuits	2.5	1
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1 Q# 018					2		Ability to determine and interpret the following as they apply to the VSSV/Post-Trip Stabilization: Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.2	1
BW/A01 Plant Runback / 1 Q# 019				3			Ability to operate/monitor the following as they apply to the Runback: Desired operating results during abnormal/emergency situations	3.7	1
BW/A04 Turbine Trip / 4 Q# 020	1						Knowledge of the operational implications of the following concepts as they apply to the Turbine Trip: Components, capacity, and functions of emergency systems.	3.0	1
~~000008 Pressurizer Vapor Space Accident / 3~~									
000009 Small Break LOCA / 3 Q# 021				14			Ability to operate and/or monitor the following as they apply to a small break LOCA: Secondary pressure control	3.4	1
~~000011 Large Break LOCA / 3~~									
~~W/E04 LOCA Outside Containment / 3~~									
BW/E08; W/E03 LOCA Cooldown/Depress. / 4 Q# 022						4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency/abnormal procedures	4.0	1
~~W/E11 Loss of Emergency Coolant Recirc. / 4~~									
~~W/EO1 & E02 Rediagnosis & SI Termination / 3~~									
~~000022 Loss of Reactor Coolant Makeup / 2~~									
000025 Loss of RHR System / 4 Q# 023					01		Ability to determine and interpret the following as they apply to the Loss of RHR System: Proper amperage of running LPI/DHR pumps	2.7	1
000029 Anticipated Transient w/o Scram / 1 Q# 024				08			Ability to operate and/or monitor the following as they apply to a ATWS: Reactor trip switch pushbutton	4.5	1
000032 Loss of Source Range NI / 7 Q# 025			01				Knowledge of the reasons for the following responses as they apply to the Loss of SR NI: Startup termination on source-range loss	3.2	1
000033 Loss of Intermediate Range NI / 7 Q# 026	01						Knowledge of the operational implications of the following concepts as they apply to Loss of IR NI: Effects of voltage changes on performance	2.7	1
000037 Steam Generator Tube Leak / 3 Q# 027			07				Knowledge of the reasons for the following responses as they apply to the S/G Tube Leak: Actions contained in EOP for S/G tube leak	4.2	1
000038 Steam Generator Tube Rupture / 3 Q# 028			08				Knowledge of the reasons for the following responses as they apply to the SGTR: Criteria for securing RCP	4.1	1
000054 (CE/E06) Loss of Main Feedwater / 4 Q# 029			04				Knowledge of the reasons for the following responses as they apply to the Loss of MFW: Actions contained in EOPs for loss of MFW	4.4	1
~~BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4~~									
000058 Loss of DC Power / 6 Q# 030	01						Knowledge of the operational implications of the following concepts as they apply to the Loss of DC: Battery charger equipment/instrumentation	2.8	1
000059 Accidental Liquid RadWaste Rel. / 9 Q# 031		02					Knowledge of the interrelations between the Accidental Liquid Radwaste Release and the following: Radioactive-gas monitors	2.7	1
000060 Accidental Gaseous Radwaste Rel. / 9 Q# 032					06		Ability to determine/interpret the following as they apply to the Accidental Gaseous Release: Valve lineup for release of radioactive gases	3.6	1
000061 ARM System Alarms / 7 Q# 033					04		Ability to determine and interpret the following as they apply to the Area RM System Alarms: Whether an alarm channel is functioning properly	3.1	1
~~W/E16 High Containment Radiation / 9~~									
~~CE/E09 Functional Recovery~~									
K/A Category Point Totals:	3	2	4	3	4	1	Group Point Total:		17

ES-401 PWR RO Examination OutlineForm ES-401-4
Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

E/APE # / Name / Safety Function Question Number	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2 Q# 034					10		Ability to determine or interpret the following as they apply to the Pressurizer Level Control Malfunctions: Whether the automatic mode for PZR level control is functioning improperly, necessity of shift to manual modes	3.3	1
000036 (BW/A08) Fuel Handling Accident / 8 Q# 035						4. 4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency/abnormal procedures	4.0	1
000056 Loss of Off-site Power / 6 Q# 036			01				Knowledge of the reasons for the following responses as they apply to the Loss of Offsite Power: Order and time to initiation of power for the load sequencer	3.5	1
~~000065 Loss of Instrument Air / 8~~									
~~BW/E13&E14 EOP Rules and Enclosures~~									
~~BW/A05 Emergency Diesel Actuation / 6~~									
~~BW/A07 Flooding / 8~~									
~~CE/A16 Excess RCS Leakage / 2~~									
~~W/E13 Steam Generator Over-pressure / 4~~									
~~W/E15 Containment Flooding / 5~~									
K/A Category Point Totals:	0	0	1	0	1	1	Group Point Total:		3

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Plant Systems - Tier 2/Group 1 (page 1 of 2)

System # / Name Question Number	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
001 Control Rod Drive Q# 037							06					Ability to predict/monitor changes in parameters associated with operating the CRDS controls including: Reactor power	4.1	1
Q# 038										10		Ability to manually operate and/or monitor in the control room: Determination of an ECP	3.5	1
003 Reactor Coolant Pump Q# 039					04							Knowledge of the operational implications of the following concepts as they apply to the RCPs: Effects of RCP shutdown on secondary parameters, such as steam pressure, steam flow, and feed flow	3.2	1
Q# 040							02					Ability to predict/monitor changes in parameters associated with operating the RCPs controls including: RCP pump and motor bearing temperatures	2.9	1
004 Chemical and Volume Control Q# 041		06										Knowledge of bus power supplies to the following: Control instrumentation	2.6	1
Q# 042					07							Knowledge of the operational implications of the following concepts as they apply to the CVCS: Relationship between SUR and reactivity	2.8	1
013 Engineered Safety Features Actuation Q# 043			03									Knowledge of the effect that a loss or malfunction of the ESFAS will have on the following: Containment	4.3	1
015 Nuclear Instrumentation Q# 044			06									Knowledge of the effect that a loss or malfunction of the NIS will have on the following: Reactor regulating system	2.9	1
Q# 045				08								Knowledge of NIS design features and/or interlocks provide for the following: Automatic rod motion on demand signals	3.4	1
017 In-core Temperature Monitor Q# 046								01				Ability to predict the impacts of the following malfunctions or operations on the ITM system; and based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Thermocouple open and short circuits	3.1	1
Q# 047										02		Ability to manually operate and/or monitor in the control room: Temperature values used to determine RCP operation during inadequate core cooling	3.8	1
022 Containment Cooling Q# 048	01											Knowledge of the physical connections and/or cause-effect relationships between the CCS and the following systems: SWS	3.5	1
Q# 049			01									Knowledge of the effect that a loss or malfunction of the CCS will have on the following: Containment equipment subject to damage by high or low temperature, humidity, and pressure	2.9	1

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Plant Systems - Tier 2/Group 1 (page 2 of 2)

System # / Name Question Number	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
~~025 Ice Condenser~~														
056 Condensate Q# 050	03											Knowledge of the physical connections and/or cause-effect relationships between the Condensate System and the following systems: MFW	2.6	1
Q# 051								04				Ability to predict the impacts of the following malfunctions or operations on the Condensate System; and based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Loss of condensate pumps	2.6	1
059 Main Feedwater Q# 052			03									Knowledge of the effect that a loss or malfunction of the MFW will have on the following: S/Gs	3.5	1
Q# 053							03					Ability to predict/monitor changes in parameters associated with operating the MFW controls including: Power level restrictions for operation of MFW pumps and valves	2.7	1
061 Auxiliary/Emergency Feedwater Q# 054						01						Knowledge of the effect that a loss of the following will have on the AFW components: Controllers and positioners	2.5	1
Q# 055											1.30	Ability to locate and operate components, including local controls	3.9	1
068 Liquid Radwaste Q# 056								04				Ability to predict the impacts of the following malfunctions or operations on the Liquid Radwaste System; and based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Failure of automatic isolation	3.3	1
071 Waste Gas Disposal Q# 057									03			Ability to monitor automatic operation of the Waste Gas Disposal System including: Radiation monitoring system alarm and actuating signals	3.6	1
072 Area Radiation Monitoring Q# 058					02							Knowledge of the operational implications of the following concepts as they apply to the ARM system: Radiation intensity changes with source distance	2.5	1
Q# 059											4.2	Knowledge of system setpoints, interlocks and automatic actions associated with EOP entry conditions	3.9	1
K/A Category Point Totals:	2	1	4	1	3	1	3	3	1	2	2	Group Point Total:		23

ES-401 PWR RO Examination OutlineForm ES-401-4
Plant Systems - Tier 2/Group 2 (page 1 of 2)

System # / Name Question Number	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
002 Reactor Coolant Q# 060											2.25	Knowledge of bases in Tech Specs for LCOs and safety limits	2.5	1
006 Emergency Core Cooling Q# 061			03									Knowledge of the effect that a loss or malfunction of the ECCS will have on the following: Containment	4.2	1
010 Pressurizer Pressure Control Q# 062								02				Ability to predict the impacts of the following malfunctions or operations on the PZR PCS system; and based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Spray valve failures	3.9	1
011 Pressurizer Level Control Q# 063	02											Knowledge of the physical connections and/or cause-effect relationships between the PZR LCS and the following systems: RCS	3.7	1
012 Reactor Protection Q# 064							01					Ability to predict/monitor changes in parameters associated with operating the RPS controls including: Trip setpoint adjustment	2.9	1
014 Rod Position Indication Q# 065				05								Knowledge of RPIS design features and/or interlocks provide for the following: Rod hold interlocks	3.1	1
016 Non-nuclear Instrumentation Q# 066	03											Knowledge of the physical connections and/or cause-effect relationships between the NNIS and the following systems: Steam dump system	3.0	1
026 Containment Spray Q# 067		01										Knowledge of bus power supplies to the following: Containment spray pumps	3.4	1
029 Containment Purge Q# 068								03				Ability to predict the impacts of the following malfunctions or operations on the Containment Purge System; and based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Startup operations and the associated required valve lineups	2.7	1
033 Spent Fuel Pool Cooling Q# 069									02			Ability to monitor automatic operation of the Spent Fuel Pool Cooling System including: Spent fuel leak or rupture	2.9	1
035 Steam Generator Q# 070						01						Knowledge of the effect that a loss of the following will have on the S/Gs: MSIVs	3.2	1

ES-401 PWR RO Examination OutlineForm ES-401-4
Plant Systems - Tier 2/Group 2 (page 2 of 2)

System # / Name Question Number	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
039 Main and Reheat Steam Q# 071									02			Ability to monitor automatic operation of the MRSS including: Isolation of the MRSS	3.1	1
055 Condenser Air Removal Q# 072	06											Knowledge of the physical connections and/or cause-effect relationships between the CARS and the following systems: Process radiation monitors	2.6	1
062 AC Electrical Distribution Q# 073								08				Ability to predict the impacts of the following malfunctions or operations on the AC Distribution System; and based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Consequences of exceeding voltage limitations	2.7	1
063 DC Electrical Distribution Q# 074			02									Knowledge of the effect that a loss or malfunction of the DC Electrical System will have on the following: Components using DC control power	3.5	1
064 Emergency Diesel Generator Q# 075								03				Ability to predict the impacts of the following malfunctions or operations on the ED/G system; and based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Parallel operation of ED/Gs	3.1	1
073 Process Radiation Monitoring Q# 076				02								Knowledge of PRM system design features and/or interlocks provide for the following: Letdown isolation on high RCS activity	3.3	1
075 Circulating Water Q# 077											4.2	Knowledge of system setpoints, interlocks and automatic actions associated with EOP entry conditions	3.9	1
079 Station Air Q# 078										01		Ability to manually operate and/or monitor in the control room: Cross-tie valves with IAS	2.7	1
086 Fire Protection Q# 079										01		Ability to manually operate and/or monitor in the control room: Fire water pumps	3.3	1
K/A Category Point Totals:	3	1	2	2	0	1	1	4	2	2	2	Group Point Total:		20

ES-401 PWR RO Examination OutlineForm ES-401-4
Plant Systems - Tier 2/Group 3

System # / Name Question Number	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
005 Residual Heat Removal Q# 080										04		Ability to manually operate and/or monitor in the control room: Controls and indication for closed cooling water pumps	3.1	1
007 Pressurizer Relief/Quench Tank Q# 081	03											Knowledge of the physical connections and/or cause-effect relationships between the PRTS and the following systems: RCS	3.0	1
~~008 Component Cooling Water~~														
027 Containment Iodine Removal Q# 082					01							Knowledge of the operational implications of the following concepts as they apply to the CIRS: Purpose of charcoal filters	3.1	1
~~028 Hydrogen Recombiner and Purge Control~~														
034 Fuel Handling Equipment Q# 083									02			Ability to monitor automatic operation of the Fuel Handling System including: Load limits	2.5	1
041 Steam Dump/Turbine Bypass Control Q# 084								03				Ability to predict the impacts of the following malfunctions or operations on the SDS; and based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Loss of IAS	2.8	1
045 Main Turbine Generator Q# 085				42								Knowledge of MT/G system design features and/or interlocks provide for the following: Operation of turbine bypass in event of load loss or plant trip	2.8	1
~~076 Service Water~~														
078 Instrument Air Q# 086			02									Knowledge of the effect that a loss or malfunction of the IAS will have on the following: Systems having pneumatic valves and controls	3.4	1
103 Containment Q# 087	08											Knowledge of the physical connections and/or cause-effect relationships between the containment system and the following systems: SIS, including action of safety injection reset	3.6	1
K/A Category Point Totals:	2	0	1	1	1	0	0	1	1	1	0	Group Point Total:		8

Plant-Specific Priorities System / Topic	Recommended Replacement for...	Reason	Points

Plant-Specific Priority Total: (limit 10)			

Facility: TMI	Date of Exam:	Exam Level: RO		
Category	K/A # Q#	Topic	Imp.	Points
Conduct of Operations	2.1.3 Q# 088	Knowledge of shift turnover practices.	3.0	1
	2.1.25 Q# 089	Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data.	2.8	1
	2.1.29 Q# 090	Knowledge of how to conduct and verify valve lineups.	3.4	1
	2.1.32 Q# 091	Ability to explain and apply all system limits and precautions.	3.4	1
	2.1.			
	2.1.			
	Total			4
Equipment Control	2.2.11 Q# 092	Knowledge of the process for controlling temporary changes.	2.5	1
	2.2.12 Q# 093	Knowledge of surveillance procedures.	3.0	1
	2.2.13 Q# 094	Knowledge of tagging and clearance procedures.	3.6	1
	2.2.			
	2.2.			
	2.2.			
	Total			3
Radiation Control	2.3.1 Q# 095	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	2.6	1
	2.3.2 Q# 096	Knowledge of facility ALARA program.	2.5	1
	2.3.4 Q# 097	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1
	2.3.			
	2.3.			
	2.3.			
	Total			3
Emergency Procedures/ Plan	2.4.11 Q# 098	Knowledge of abnormal condition procedures.	3.4	1
	2.4.18 Q# 099	Knowledge of the specific bases for EOPs.	2.7	1
	2.4.49 Q# 100	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	1
	2.4.			
	2.4.			
	2.4.			
	Total			3
Tier 3 Point Total (RO/SRO)				13

Facility: | Date of Exam: | Exam Level: RO/SRO

	Item Description				Initial a	Initial b*	Initial c#
1.	Questions and answers technically accurate and applicable to facility				WGO	RJP	B
2.	a. NRC K/As referenced for all questions b. Facility learning objectives referenced as available				WGO	RJP	B
3.	RO/SRO overlap is no more than 75 percent, and SRO questions are appropriate per Section D.2.d of ES-401				N/A	N/A	N/A
~~4.~~	~~No more than 25 questions are duplicated from [practice exams, quizzes, and] the last two NRC licensing exams; enter the actual number of duplicated questions at right.~~	~~NRC~~	~~Other~~		N/A	N/A	NA
4.	~~[No (Less than 5 percent)~~ Question duplication from the license screening/audit exam ~~(if independently written)]~~ was controlled as indicated below ~~(check the~~ item that applies) and appears appropriate: __ the audit exam was systematically and randomly developed; or __ the audit exam was completed before the license exam was started; or ✓ the licensee certifies that there is no duplication; or __ the license exam was prepared by the NRC				WGO	RJP	B *
5.	Bank use meets limits (no more than 50 percent from the bank, at least 10 percent new, and the rest modified); enter the actual question distribution at right	Bank	Modified	New	WGO	RJP	B
		25	2	73			
6.	Between 50 and 60 percent of the questions on the exam (including 10 new questions) are written at the comprehension/analysis level; enter the actual question distribution at right	Memory	C/A		WGO	RJP	B
		45	55				
7.	References/handouts provided do not give away answers				WGO	RJP	B
8.	Question content conforms with specific K/A statements in the ~~distribution meets~~ previously approved examination outline; deviations are justified				WGO	RJP	B
9.	Question psychometric quality and format meet ES, Appendix B, guidelines				WGO	RJP	B
10.	The exam contains 100 one-point, multiple choice items; the total is correct and agrees with value on cover sheet				WGO	RJP	B

	Printed Name / Signature	Date
a. Author	William G. Ogle Jr. / W. G. Ogle Jr.	5/18/00
b. Facility Reviewer(*)	R. Ofarenku III / R. Ofarenku	5/18/00
c. NRC Chief Examiner(*)	PAUL BISSETT / P. Bissett	6/8/00
d. NRC Regional Supervisor(*)	Richard V. Conte / R. V. Conte	6/28/00

Note: * The facility reviewer's signature is not applicable for NRC-developed examinations; two independent NRC reviews are required.
See special instructions (Section E.2.c) for Items 1, ~~4,~~ 5, and ~~6~~8.
~~[] The items in brackets do not apply to NRC-prepared examinations.~~

* Based on verbal report from licensee, exam was generated using KA random generator. WGO

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

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. U/E/S	6. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward		
1	H	3										S	
2	H	2										S	
3	H	3										S	
4	F	2 ?										S?	Overly simplistic question - Licensee will replace.
5	F	2										S	
6	F	2										S	
7	F	2										S	
8	F	2										S	
9	H	2										S	
10	H	2										S	

Instructions

[Refer to 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. 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?
6. 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. U/E/S	6. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward		
11	F	2										S	
12	F	2										S	
13	F	2										S?	Basic—but OK
14	H	3										S	
15	F	2										S?	Basic --- but OK
16	H	3										S	
17	H	3										S	
18	H	3										S	
19	H	2										S	
20	F	2										S	
21	H	2										S	
22	H	3										S	
23	H	2										S	
24	F	2										S	
25	F	2										S	
26	H	3										S	
27	F	2										S	
28	H	2										S	
29	H	3										S	
30	H	3										S	

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. U/E/S	6. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward		
31	F	2										S	
32	F	2										S	
33	F	2										S?	Told the licensee didn't like the distractor "C". They will look at it and revise as necessary.
34	H	3										S	
35	F	2									X	U	Don't agree that this is a BWL question..
36	F	2				X						S?	I feel that this question is OK
37	H	2										S	
38	H	3										S	
39	H	2										S	
40	F	2									X	U	Will replace.
41	F	2										S	Question Is OK
42	H	2										S	
43	H	3										S	
44	H	3										S	
45	H	3				X?						S	Reviewed with licensee. Question is OK
46	H	3										S	
47	F	2										S	Ok
48	F	2										S	
49	H	2										S	
50	H	3				X?						S	Since they say and highlight INITIAL, question Is OK

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. U/E/S	6. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward		
51	H	3										S	
52	H	2										S	
53	F	1?										S?	Will consider replacement.
54	H	2										S	
55	H	3										S	
56	F	2										S	
57	H	3										S	
58	F	1										U	Will replace.
59	F	2										S	
60	F	2										S	
61	H	2										S	
62	H	2										S	
63	F	1										U?	Will replace.
64	F	3										S	
65	H	3										S	
66	F	2										S	
67	F	1										U	I feel that it's more than just a power supply question. I think it's OK
68	H	2										S	
69	F	2				X?						S	
70	H	2										S	

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. U/E/S	6. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward		
71	F	1										U?	Might appear basic, but it's not. Even Parnell had to have them prove that "A" was the correct answer because he didn't think it was correct.
72	H	2										S	
73	F	2							X			U	Will replace.
74	H	2										S	
75	H	2				X						S?	OK
76	F	2										S	
77	F	2										S	
78	H	2										S	
79	F	1										U	I think I agree that it's an OK question..
80	F	1										U	Will replace.
81	H	2										S	
82	F	2										S	
83	F	2										S	
84	H	2										S	
85	H	3										S	
86	H	2										S	
87	H	2										S	
88	F	2										S	
89	H	2										S	
90	F	1										S	Ok question.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. U/E/S	6. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward		
91	F	2										S	
92	F	2										S	
93	F	2				X						S?	Will reevaluate distractors A & B.
94	F	2										S	If randomly and systematicall selected, it's OK if used on the last two exams.
95	F	2										S	
96	F	2										S	
97	F	2										S	Same as response for question 94.
98	H	3										S	
99	H	3										S	
100	H	3										S	

Summary Comments:

Facility: TMI Date of Exam: 6/29/00 Exam Level: RO/SRO

Item Description	Initials a	Initials b	Initials c
1. Clean answer sheets copied before grading	WGO	PJP	B
2. Answer key changes and question deletions justified and documented	WGO	PJP	B
3. Applicants' scores checked for addition errors (reviewers spot check > 25% of examinations)	WGO	PJP	B
4. Grading for all borderline cases (80% +/- 2%) reviewed in detail	WGO	PJP	B
5. All other failing examinations checked to ensure that grades are justified	WGO	PJP	NA
6. Performance on missed questions checked for training deficiencies and wording problems; evaluate validity of questions missed by half or more of the applicants	WGO	PJP	B

	Printed Name / Signature	Date
a. Grader	[illegible]	6/30/00
b. Facility Reviewer (*)	[illegible]	7/3/00
c. NRC Chief Examiner (*)	P BISSETT / [illegible]	7/12/00
d. NRC Supervisor (*)	Richard J. Conte / [illegible]	7/13/00

(*) The facility reviewer's signature is not applicable for examinations graded by the NRC; two independent NRC reviews are required.

1. Pre-Examination

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of 6-26-00 as of the date of my signature. I agree that I will not knowingly divulge any information about these examinations to any persons who have not been authorized by the NRC chief examiner. I understand that I am not to instruct, evaluate, or provide performance feedback to those applicants scheduled to be administered these licensing examinations from this date until completion of examination administration, except as specifically noted below and authorized by the NRC.Furthermore, I am aware of the physical security measures and requirements (as documented in the facility licensee's procedures) and understand that violation of the conditions of this agreement may result in cancellation of the examinations and/or an enforcement action against me or the facility licensee. I will immediately report to facility management or the NRC chief examiner any indications or suggestions that examination security may have been compromised.

2. Post-Examination

To the best of my knowledge, I did not divulge to any unauthorized persons any information concerning the NRC licensing examinations administered during the week(s) of 6-26-00. From the date that I entered into this security agreement until the completion of examination administration, I did not instruct, evaluate, or provide performance feedback to those applicants who were administered these licensing examinations, except as specifically noted below and authorized by the NRC.

PRINTED NAME	JOB TITLE / RESPONSIBILITY	SIGNATURE (1)	DATE	SIGNATURE (2)	DATE	NOTE
1. William G. Ogle Jr.	LIST / Exam writer		3/14/00		6/29/00	
2. John L. Carney	INST IV / Exam writer		3/14/00		6-29-00	
3. R L PARNELL III	OTM / Reviewer		3/20/00		7/3/00	
4. R E Boyer	S/M Exam Review		5-10-00		7-7-00	
5. D.L. WILT	INST. / EXAM REVIEW		5-15-00		7-6-2000	
6. William Craddock	RO / Exam Review		5/16/00		7/7/00	
7.						
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10.						
11.						
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15.						

NOTES: