

Facility: Millstone Unit 2													Date of Exam: 03/21/05				
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	2	3	2	N/A			3	4	N/A			4	18	2	4	6
	2	0	1	3	N/A			2	2	N/A			1	9	4	0	4
	Tier Totals	2	4	5	N/A			5	6	N/A			5	27	6	4	10
2. Plant Systems	1	1	2	2	4	1	2	2	5	4	3	2	28	2	3	5	
	2	1	0	2	0	2	0	2	2	0	1	0	10	1	2	3	
	Tier Totals	2	2	4	4	3	2	4	7	4	4	2	38	3	5	8	
3. Generic Knowledge and Abilities Categories					1	2	3	4	10				1	2	3	4	7
					2	3	2	3					1	2	2	2	
<p>Note:</p> <ol style="list-style-type: none"> <li>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).</li> <li>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.</li> <li>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 the elimination of inappropriate K/A statements.</li> <li>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.</li> <li>5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.</li> <li>6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.</li> <li>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.</li> <li>8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above. Use duplicate pages for RO and SRO-only exams.</li> <li>9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.</li> </ol>																	

ES-401										PWR Examination Outline		Form ES-401-2	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO)													
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#				
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1	X						EK1.2 Knowledge of the operational implications of the following concepts as they apply to the (Reactor Trip Recovery): Normal, abnormal and emergency operating procedures associated with (Reactor Trip Recovery)	3.0	1				
000008 Pressurizer Vapor Space Accident / 3		X					AA2.02 Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: PZR spray valve position indicators and acoustic monitors	3.9	1				
000009 Small Break LOCA / 3		X					EK2.03 Knowledge of the interrelations between the small break LOCA and the following: S/Gs	3.0	1				
000011 Large Break LOCA / 3				X			EA1.17 Ability to operate and monitor the following as they apply to a Large Break LOCA: Safety parameter display system	3.5	1				
000015/17 RCP Malfunctions / 4		X					AK2.10 Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following: RCP indicators and controls	2.8	1				
000022 Loss of Rx Coolant Makeup / 2						X	2.2.2 Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels	4.0	1				
000025 Loss of RHR System / 4					X		AA2.07 Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: Pump cavitation	3.4	1				
000026 Loss of Component Cooling Water / 8					X		AA1.05 Ability to operate and / or monitor the following as they apply to the Loss of Component Cooling Water: The CCWS surge tank, including level control and level alarms, and radiation alarm	3.1	1				
000027 Pressurizer Pressure Control System Malfunction / 3						X	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation	3.7	1				
000029 ATWS / 1						X	2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation	3.9	1				
000038 Steam Gen. Tube Rupture / 3	X						EK1.03 Knowledge of the operational implications of the following concepts as they apply to the SGTR: Natural circulation	3.9	1				
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4				X			EA1.1 Ability to operate and / or monitor the following as they apply to the (Excess Steam Demand): Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.9	1				

000054	(CE/E06) Loss of Main Feedwater / 4				X			EA1.2 Ability to operate and / or monitor the following as they apply to the (Loss of Feedwater): Operating behavior characteristics of the facility.	3.4	1
000055	Station Blackout / 6					X		EA2.02 Ability to determine or interpret the following as they apply to a Station Blackout: RCS core cooling through natural circulation cooling to S/G cooling	4.4	1
000056	Loss of Off-site Power / 6									
000057	Loss of Vital AC Inst. Bus / 6						X	2.4.10 Knowledge of annunciator response procedures	3.0	1
000058	Loss of DC Power / 6			X				AK3.01 Knowledge of the reasons for the following responses as they apply to the Loss of DC Power: Use of dc control power by D/Gs	3.4	1
000062	Loss of Nuclear Svc Water / 4					X		AA2.01 Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: Location of a leak in the SWS	2.9	1
000065	Loss of Instrument Air / 8			X				AK3.04 Knowledge of the reasons for the following responses as they apply to the Loss of Instrument Air: Cross-over to backup air supplies	3.0	1
W/E04	LOCA Outside Containment / 3									
W/E11	Loss of Emergency Coolant Recirc. / 4									
BW/E04; W/E05	Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4									
K/A Category Totals:		2	3	2	3	4	4	Group Point Total:	18	

ES-401		PWR Examination Outline						Form ES-401-2	
		Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO)							
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000001 Continuous Rod Withdrawal / 1				X			AA1.05 Ability to operate and / or monitor the following as they apply to the Continuous Rod Withdrawal : Reactor trip switches	4.3	1
000003 Dropped Control Rod / 1					X		AA2.01 Ability to determine and interpret the following as they apply to the Dropped Control Rod: Rod position indication to actual rod position	3.9	1
000005 Inoperable/Stuck Control Rod / 1			X				AK3.05 Knowledge of the reasons for the following responses as they apply to the Inoperable / Stuck Control Rod: Power limits on rod misalignment	3.4	1
000024 Emergency Boration / 1									
000028 Pressurizer Level Malfuction / 2			X				AK3.05 Knowledge of the reasons for the following responses as they apply to the Pressurizer Level Control Malfunctions: Actions contained in EOP for PZR level malfunction	3.7	1
000032 Loss of Source Range NI / 7			X				AK3.02 Knowledge of the reasons for the following responses as they apply to the Loss of Source Range Nuclear Instrumentation: Guidance contained in EOP for loss of source-range nuclear instrumentation	3.7	1
000033 Loss of Intermediate Range NI / 7					X		2.3.4 Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized	2.5	1
000036 (BW/A08) Fuel Handling Accident / 8									
000037 Steam Generator Tube Leak / 3									
000051 Loss of Condenser Vacuum / 4									
000059 Accidental Liquid RadWaste Rel. / 9				X			AA2.06 Ability to determine and interpret the following as they apply to the Accidental Liquid Radwaste Release: That the flow rate of the liquid being released is less than or equal to that specified on the release permit	3.5	1
000060 Accidental Gaseous Radwaste Rel. / 9									
000061 ARM System Alarms / 7									
000067 Plant Fire On-site / 8				X			AA1.09 Ability to operate and / or monitor the following as they apply to the Plant Fire on Site: Plant fire zone panel (including detector location)	3.0	1
000068 (BW/A06) Control Room Evac. / 8		X					AK2.02 Knowledge of the interrelations between the Control Room Evacuation and the following: Reactor trip system	3.7	1
000069 (W/E14) Loss of CTMT Integrity / 5									

000074 (W/E06&E07) Inad. Core Cooling / 4									
000076 High Reactor Coolant Activity / 9									
W/E01 & E02 Rediagnosis & SI Termination / 3								Topic not applicable to Millstone Unit 2	
W/E13 Steam Generator Over-pressure / 4								Topic not applicable to Millstone Unit 2	
W/E15 Containment Flooding / 5								Topic not applicable to Millstone Unit 2	
W/E16 High Containment Radiation / 9								Topic not applicable to Millstone Unit 2	
BW/A01 Plant Runback / 1								Topic not applicable to Millstone Unit 2	
BW/A02 & A03 Loss of NNI-XY / 7								Topic not applicable to Millstone Unit 2	
BW/A04 Turbine Trip / 4								Topic not applicable to Millstone Unit 2	
BW/A05 Emergency Diesel Actuation / 6								Topic not applicable to Millstone Unit 2	
BW/A07 Flooding / 8								Topic not applicable to Millstone Unit 2	
BW/E03 Inadequate Subcooling Margin / 4								Topic not applicable to Millstone Unit 2	
BW/E08; W/E03 LOCA Cooldown - Depress. / 4								Topic not applicable to Millstone Unit 2	
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4									
BW/E13 & E14 EOP Rules and Enclosures								Topic not applicable to Millstone Unit 2	
CE/A11; W/E08 RCS Overcooling - PTS / 4									
CE/A16 Excess RCS Leakage / 2									
CE/E09 Functional Recovery									
K/A Category Point Totals:	0	1	3	2	2	1	Group Point Total:		9

ES-401	PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO)											Form ES-401-2		
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
003 Reactor Coolant Pump					X			X				K5.04 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  A1.03 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPS controls including: RCP motor stator winding temperatures	3.2  2.6	2
004 Chemical and Volume Control										X		A4.18 Ability to manually operate and/or monitor in the control room: Emergency borate valve	2.7	1
005 Residual Heat Removal			X									K3.06 Knowledge of the effect that a loss or malfunction of the RHRS will have on the following: CSS	3.1	1
006 Emergency Core Cooling						X						K6.13 Knowledge of the effect of a loss or malfunction on the following will have on the ECCS: Pumps	2.8	1
007 Pressurizer Relief/Quench Tank							X					A1.03 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including: Monitoring quench tank temperature	2.6	1
008 Component Cooling Water											X	2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation	3.9	1
010 Pressurizer Pressure Control									X			A3.01 Ability to monitor automatic operation of the PZR PCS, including: PRT temperature and pressure during PORV testing	3.0	1
012 Reactor Protection			X									K3.01 Knowledge of the effect that a loss or malfunction of the RPS will have on the following: CRDS  A3.02 Ability to monitor automatic operation of the RPS, including: Bistables	3.9  3.6	2
013 Engineered Safety Features Actuation								X				A2.04 Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations; Loss of instrument bus	3.6	1

022 Containment Cooling	X														K2.01 Knowledge of power supplies to the following: Containment cooling fans	3.0	1
025 Ice Condenser															Topic not applicable to Millstone Unit 2		
026 Containment Spray			X												K4.06 Knowledge of CSS design feature(s) and/or interlock(s) which provide for the following: Iodine scavenging via the CSS	2.8	1
039 Main and Reheat Steam	X									X					K1.01 Knowledge of the physical connections and/or cause-effect relationships between the MRSS and the following systems: S/G  A3.02 Ability to monitor automatic operation of the MRSS, including: Isolation of the MRSS	3.1 3.1	2
059 Main Feedwater			X							X					K4.08 Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following: Feedwater regulatory valve operation (on basis of steam flow, feed flow mismatch)  A2.01 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: Feedwater actuation of AFW system	2.5 3.4	2
061 Auxiliary/Emergency Feedwater					X					X					K6.01 Knowledge of the effect of a loss or malfunction of the following will have on the AFW components: Controllers and positioners  A2.05 Ability to (a) predict the impacts of the following malfunctions or operations on the AFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Automatic control malfunction	2.5 3.1	2
062 AC Electrical Distribution	X														K2.01 Knowledge of bus power supplies to the following: Major system loads	3.3	1
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	1
064 Emergency Diesel Generator			X												K4.03 Knowledge of ED/G system design feature(s) and/or interlock(s) which provide for the following: Governor valve operation	2.5	1
073 Process Radiation Monitoring										X				X	K4.01 Knowledge of PRM system design feature(s) and/or interlock(s) which provide for the following: Release termination when radiation exceeds setpoint  A4.02 Ability to manually operate and/or monitor in the control room: Radiation monitoring system control panel	4.0 3.7	2

076 Service Water										X			A2.02 Ability to (a) predict the impacts of the following malfunctions or operations on the SWS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Service water header pressure	2.7	1	
078 Instrument Air				X									K4.02 Knowledge of IAS design feature(s) and/or interlock(s) which provide for the following: Cross-over to other air systems	3.2	2	
												X	2.2.13 Knowledge of tagging and clearance procedures	3.6		
103 Containment											X		A4.03 Ability to manually operate and/or monitor in the control room: ESF slave relays	2.7	1	
K/A Category Point Totals:	1	2	2	4	1	2	2	5	4	3	2	Group Point Total:				28



ES-401											PWR Examination Outline		Form ES-401-2	
											Plant Systems - Tier 2/Group 2 (RO)			
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
001 Control Rod Drive					X							K5.26 Knowledge of the following operational implications as they apply to the CRDS: Definition of moderator temperature coefficient; application to reactor control	3.3	1
002 Reactor Coolant														
011 Pressurizer Level Control														
014 Rod Position Indication							X					A1.04 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RPIS controls, including: Axial and radial power distribution	3.5	1
015 Nuclear Instrumentation														
016 Non-nuclear Instrumentation														
017 In-core Temperature Monitor														
027 Containment Iodine Removal												Topic not applicable to Millstone Unit 2		
028 Hydrogen Recombiner and Purge Control			X									K3.01 Knowledge of the effect that a loss or malfunction of the HRPS will have on the following: Hydrogen concentration in containment	3.3	1
029 Containment Purge										X		A4.01 Ability to manually operate and/or monitor in the control room: Containment purge flow rate	2.5	1
033 Spent Fuel Pool Cooling														
034 Fuel Handling Equipment							X					A1.02 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the Fuel Handling System controls including: Water level in the refueling canal	2.9	1
035 Steam Generator														
041 Steam Dump/Turbine Bypass Control														

045 Main Turbine Generator									X												A2.08 Ability to (a) predict the impacts of the following malfunctions or operation on the MT/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Steam dumps are not cycling properly at low load, or stick open at higher load (isolate and use atmospheric reliefs when necessary)	2.8	1	
055 Condenser Air Removal																								
056 Condensate																								
068 Liquid Radwaste					X																	K5.04 Knowledge of the operational implication of the following concepts as they apply to the Liquid Radwaste System: Biological hazards of radiation and the resulting goal of ALARA	3.2	1
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	2.5	1
072 Area Radiation Monitoring	X																					K1.05 Knowledge of the physical connections and/or cause-effect relationships between the ARM system and the following systems: MRSS	2.8	1
075 Circulating Water			X																			K3.07 Knowledge of the effect that a loss or malfunctions of the circulating water system will have on the following: ESFAS	3.4	1
079 Station Air																								
086 Fire Protection																								
K/A Category Point Totals:	1	0	2	0	2	0	2	2	0	1	0											Group Point Total:		10

ES-401		PWR Examination Outline						Form ES-401-2	
		Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)							
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1					X		EA2.2 Ability to determine and interpret the following as they apply to the (Reactor Trip Recovery): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	4.0	1
000008 Pressurizer Vapor Space Accident / 3									
000009 Small Break LOCA / 3									
000011 Large Break LOCA / 3									
000015/17 RCP Malfunctions / 4									
000022 Loss of Rx Coolant Makeup / 2						X	2.2.12 Knowledge of surveillance procedures	3.4	1
000025 Loss of RHR System / 4									
000026 Loss of Component Cooling Water / 8						X	2.4.20 Knowledge of operational implications of EOP warnings, cautions, and notes	4.0	1
000027 Pressurizer Pressure Control System Malfunction / 3									
000029 ATWS / 1					X		EA2.09 Ability to determine or interpret the following as they apply to a ATWS: Occurrence of a main turbine/ reactor trip	4.5	1
000038 Steam Gen. Tube Rupture / 3						X	2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation	4.0	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4						X	2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls	4.0	1
000054 (CE/E06) Loss of Main Feedwater / 4									
000055 Station Blackout / 6									

000056	Loss of Off-site Power / 6									
000057	Loss of Vital AC Inst. Bus / 6									
000058	Loss of DC Power / 6									
000062	Loss of Nuclear Svc Water / 4									
000065	Loss of Instrument Air / 8									
W/E04	LOCA Outside Containment / 3									
W/E11	Loss of Emergency Coolant Recirc. / 4									
BW/E04; W/E05	Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4									
K/A Category Totals:					2	4	Group Point Total:			6

ES-401		PWR Examination Outline							Form ES-401-2	
		Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (SRO)								
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#	
000001										
<b>000003</b>					X		AA2.02 Ability to determine and interpret the following as they apply to the Dropped Control Rod: Signal inputs to rod control system	2.8	1	
000005										
000024										
000028										
000032										
000033										
000036										
000037										
000051										
000059										
000060										
<b>000061</b>					X		AA2.01 Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: Location of a leak in the SWS	3.5	1	
<b>000067</b>					X		AA2.09 Ability to determine and interpret the following as they apply to the Plant Fire on Site: That a failed fire alarm detector exists	2.7	1	
000068										
000069										
000074										
000076										
W/E01 & E02 Rediagnosis & SI Termination / 3							Topic not applicable to Millstone Unit 2			
W/E13 Steam Generator Over-pressure / 4							Topic not applicable to Millstone Unit 2			
W/E15 Containment Flooding / 5							Topic not applicable to Millstone Unit 2			
W/E16 High Containment Radiation / 9							Topic not applicable to Millstone Unit 2			

BW/A01 Plant Runback / 1						Topic not applicable to Millstone Unit 2		
BW/A02 & A03 Loss of NNI-X/Y / 7						Topic not applicable to Millstone Unit 2		
BW/A04 Turbine Trip / 4						Topic not applicable to Millstone Unit 2		
BW/A05 Emergency Diesel Actuation / 6						Topic not applicable to Millstone Unit 2		
BW/A07 Flooding / 8						Topic not applicable to Millstone Unit 2		
BW/E03 Inadequate Subcooling Margin / 4						Topic not applicable to Millstone Unit 2		
BW/E08; W/E03 LOCA Cooldown - Depress. / 4						Topic not applicable to Millstone Unit 2		
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4								
BW/E13 & E14 EOP Rules and Enclosures						Topic not applicable to Millstone Unit 2		
CE/A11; W/E08 RCS Overcooling - PTS / 4					X	AA2.1 Ability to determine and interpret the following as they apply to the (RCS Overcooling): Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.3	1
CE/A16 Excess RCS Leakage / 2								
CE/E09 Functional Recovery								
K/A Category Point Totals:					4	0	Group Point Total:	4

ES-401	PWR Examination Outline Plant Systems - Tier 2/Group 1 (SRO)											Form ES-401-2		
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
003 Reactor Coolant Pump								X				A2.03 Ability to (a) predict the impacts of the following malfunctions or operations on the RCPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Problems associated with RCP motors, including faulty motors and current, and winding and bearing temperature problems	3.1	1
004 Chemical and Volume Control														
005 Residual Heat Removal														
006 Emergency Core Cooling														
007 Pressurizer Relief/Quench Tank											X	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation	4.4	1
008 Component Cooling Water														
010 Pressurizer Pressure Control														
012 Reactor Protection														
013 Engineered Safety Features Actuation														
022 Containment Cooling														
025 Ice Condenser												Topic not applicable to Millstone Unit 2		
026 Containment Spray								X				A2.02 Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure of automatic recirculation transfer	4.4	1
039 Main and Reheat Steam														

059 Main Feedwater												
061 Auxiliary/Emergency Feedwater												
062 AC Electrical Distribution								X	2.2.2 Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels		3.5	1
063 DC Electrical Distribution												
064 Emergency Diesel Generator												
073 Process Radiation Monitoring												
076 Service Water								X	2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies		3.6	1
078 Instrument Air												
103 Containment												
<b>K/A Category Point Totals:</b>						<b>2</b>		<b>3</b>	<b>Group Point Total:</b>			<b>5</b>



ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 2 (SRO)											Form ES-401-2	
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
001 Control Rod Drive														
<b>002 Reactor Coolant</b>												X 2.2.12 Knowledge of surveillance procedures	3.4	1
011 Pressurizer Level Control														
014 Rod Position Indication														
015 Nuclear Instrumentation														
016 Non-nuclear Instrumentation														
017 In-core Temperature Monitor														
<b>027 Containment Iodine Removal</b>												Topic not applicable to Millstone Unit 2		
028 Hydrogen Recombiner and Purge Control														
029 Containment Purge														
033 Spent Fuel Pool Cooling														
034 Fuel Handling Equipment														
<b>035 Steam Generator</b>								X				A2.03 Ability to (a) predict the impacts of the following malfunctions or operations on the SGs; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Pressure/level transmitter failure	3.6	1
041 Steam Dump/Turbine Bypass Control														
045 Main Turbine Generator														
<b>055 Condenser Air Removal</b>												X 2.2.20 Ability to execute procedure steps	4.2	1
056 Condensate														

068 Liquid Radwaste																	
071 Waste Gas Disposal																	
072 Area Radiation Monitoring																	
075 Circulating Water																	
079 Station Air																	
086 Fire Protection																	
K/A Category Point Totals:								1		2	Group Point Total:						3

Facility: Millstone Unit 2			Date of Exam: 03/21/05			
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation	3.7	1		
	2.1.10	<b>Knowledge of conditions and limitations in the facility license (43.2)</b>			3.9	1
	2.1.14	Knowledge of system status criteria which require the notification of plant personnel	2.5	1		
	Subtotal			2		1
2. Equipment Control	2.2.13	Knowledge of tagging and clearance procedures	3.6	1		
	2.2.18	<b>Knowledge of the process for managing maintenance activities during shutdown operations (43.5)</b>			3.6	1
	2.2.25	<b>Knowledge of bases in technical specifications for limiting conditions for operations and safety limits (43.2)</b>			3.7	1
	2.2.28	Knowledge of new and spent fuel movement procedures	2.6	1		
	2.2.30	Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area, communication with fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.	3.5	1		
Subtotal			3		2	
3. Radiation Control	2.3.2	<b>Knowledge of facility ALARA program (43.4)</b>			3.0	1
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized	2.5	1		
	2.3.10	<b>Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure (43.4)</b>			3.3	1
	2.3.11	Ability to control radiation releases	2.7	1		
	Subtotal			2		2
4. Emergency Procedures/ Plan	2.4.2	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions	3.9	1		
	2.4.12	Knowledge of general operating crew responsibilities during emergency operations	3.4	1		
	2.4.19	Knowledge of EOP layout, symbols, and icons	2.7	1		
	2.4.46	<b>Ability to verify that the alarms are consistent with the plant conditions (43.5)</b>			3.6	1
	2.4.47	<b>Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material</b>			3.7	1
	Subtotal			3		2
Tier 3 Point Total				10		7



**Attachment 1**

**SENIOR REACTOR AND REACTOR OPERATOR INITIAL EXAMINATIONS  
OPERATING EXAMINATION OUTLINES**

**Millstone Power Station Unit 2  
Dominion Nuclear Connecticut, Inc. (DNC)**

Dominion Nuclear Connecticut, Inc.  
Millstone Power Station  
Rope Ferry Road  
Waterford, CT 06385



**Dominion**

**DEC 29 2004**

Mr. R. J. Conte, Chief  
Operational Safety Branch  
U.S. Nuclear Regulatory Commission  
Region I  
475 Allendale Road  
King of Prussia, PA 19406-1415

Serial No. 04-570A  
MPS Lic/BAK R0  
Docket No. 50-336  
License No. DPR-65

**DOMINION NUCLEAR CONNECTICUT, INC.**  
**MILLSTONE POWER STATION UNIT 2**  
**SENIOR REACTOR AND REACTOR OPERATOR INITIAL EXAMINATIONS**

This letter is provided in response to the request from your office, dated September 2, 2004<sup>1</sup>, to furnish the operating examination outlines by January 3, 2005, for Senior Reactor and Reactor Operator Initial Examinations at Millstone Power Station Unit 2.

Pursuant to 10 CFR 55.40(b)(3), an authorized station representative has approved the outlines contained in Attachment 1. The enclosed materials are complete and ready-to-use.

Consistent with the guidance contained in NUREG-1021 Examiners Standard 201, Attachment 1, the examination outline contained in Attachment 1 should be withheld from public disclosure until after the examination has been completed. No redacted versions are being supplied.

If you have any questions or require additional information, please contact Mr. Michael J. Wilson at (860) 437-2916.

Very truly yours,

  
J. Alan Price  
Site Vice President - Millstone

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<sup>1</sup> R.J. Conte letter from the U.S. Nuclear Regulatory Commission to D.A. Christian, "Senior Reactor and Reactor Operator Initial Examinations – Millstone Unit 2," dated September 2, 2004.

Attachments: 1

Commitments made in this letter: None.

cc: w/o attachment

U.S. Nuclear Regulatory Commission  
Region I  
475 Allendale Road  
King of Prussia, PA 19406-1415

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U.S. Nuclear Regulatory Commission  
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Rockville, MD 20852-2738

Mr. S. M. Schneider  
NRC Senior Resident Inspector  
Millstone Power Station

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

Facility: <u>Millstone Unit 2</u>		Date of Examination: <u>3/21/05</u>
Exam Level (circle one): <u>RO / SRO(I)</u> / SRO(U)		Operating Test No.: <u>1</u>
Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)		
System / JPM Title	Type Code*	Safety Function
a. <b>Manual Makeup to the VCT:</b> At the completion of this JPM, the examinee completes a manual blended make up to the VCT. (004 A2.06) (RO & SRO)	D, S	1
b. <b>Fill #1 Safety Injection Tank:</b> When the examinee begins to fill #1 Safety Injection Tank to between 55.2% and 59.3%, the "A" HPSI Pump trips. The examinee will declare the "A" HPSI Pump inoperable, place the "B" HPSI Pump in service on Facility 1, and complete filling #1 SIT. (006 A1.13) (RO & SRO)	A, M, S	3
c. <b>Start 4<sup>th</sup> RCP:</b> The examinee will start the RCP, monitor critical RCP parameters, including alarms, and secure the RCP per OP 2301C and/or ARP 2590B-083. (003 A2.03) (RO & SRO)	A, N, L, S	4(P)
d. <b>Perform TDAFP Operability Test:</b> Examinee completes the assigned section of 2610B, determines that the TDAFP is not operable, and shuts down the pump. (061 A2.04) (RO & SRO)	A, N, S	4(S)
e. <b>"A" DG Operability Test (Alternate Path):</b> Examinee performs the Facility 1 Diesel Generator Operability Test, SP 2613A, on the 'A' D/G, recognizes the "D/G 12U Trouble" annunciator. Upon receipt of information from the PEO in the diesel room, the examinee trips the 'A' D/G. (064 A4.01) (RO)	A, D, S	6
f. <b>Power Range Safety Channel and Delta T Power Channel Calibration:</b> During the performance of SP 2601D, Power Range Safety Channel and Delta T Power Channel Calibration, the examinee determines that the -10 Volt power Supply voltage is not in the acceptable range and bypasses the channel. (012 A2.04) (RO & SRO)	A, N, S	7
g. <b>Placing "B" RBCCW Pump and Heat Exchanger in Service and Removing "A" RBCCW Pump and Heat Exchanger:</b> The examinee places "B" RBCCW Pump and Heat Exchanger in service in place of "A" RBCCW Pump and Heat Exchanger. (008 A4.01) (RO & SRO)	D, S	8
h. <b>Change the Alarm Setpoint of the SJAЕ RM 5099:</b> The examinee will adjust the setpoint of the Steam Jet Air Ejector Radmonitor as specified on the attached SP2833-007. (071 A4.25) (RO & SRO)	N, S	9
i. (SPARE) <b>Hydrogen Recombiner Surveillance:</b> At the completion of this JPM, the examinee will have "A" Hydrogen Recombiner in service in accordance with SP 2608A. (028 A4.01) (RO & SRO)	A, D, S	5



In-Plant Systems <sup>@</sup> (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)		
a. <b>Removing Section 201A-1, of Battery Charger 201A, From Service:</b> At the completion of this JPM, battery charger section 201A-1 will be removed from service in accordance with 2345C section 4.13. (063 K1.03) (RO & SRO)	N	6
b. <b>Local Manual Operation of the "A" Atmospheric Dump Valve:</b> Examinee has taken local manual control of the "A" ADV and placed in to 25% open per OP 2316A. (041 A2.03) (RO & SRO)	D, E, L, R	4 (S)
c. <b>Cross-Tie Station Air With Unit 3 to Supply Unit 2 Instrument Air:</b> The examinee has successfully performed the alignment to allow Unit 3 to supply Unit 2 with Station Air and to permit Station Air to supply Instrument Air. (079 A2.01) (RO & SRO)	E, L, N	8
d. (SPARE) <b>Loss of SDC / Vent the 'A' LPSI Pp.:</b> At the completion of this JPM, the examinee will have simulated venting the "A" LPSI Pp. per AOP 2572. "Loss of SDC". (005 A2.03) (RO & SRO)	E, L, N, R	4 (P)
<p><sup>@</sup> All Control Room (and In-Plant) systems must be different and serve different safety functions; In-Plant systems and functions may overlap those tested in the Control Room.</p>		
<b>*Type Codes:</b>	<b>Criteria for RO / SRO-I / SRO-U</b>	
(A)lternate path	4-6 / 4-6 / 2-3	
(C)ontrol room		
(D)irect from bank	≤9 / ≤8 / ≤4	
(E)mergency or abnormal in-plant,	≥1 / ≥1 / ≥1	
(L)ow-Power	≥1 / ≥1 / ≥1	
(N)ew or (M)odified from bank including 1(A)	≥2 / ≥2 / ≥1	
(P)revious 2 exams	≤3 / ≤3 / ≤2 (randomly selected)	
(R)CA	≥1 / ≥1 / ≥1	
(S)imulator		

Facility: <u>MP2</u>	Scenario No.: <u>ES04L11</u>	Op-Test No.: <u>1</u>
Examiners: _____		Operators: _____
_____		_____
_____		_____
<p>Initial Conditions: <u>100% Power, EOL, RCS Boron is 35 ppm, Equilibrium Xenon, Bus 24E is aligned to Bus 24D. SG blowdown is 25 gpm on each SG. All swing components are aligned to Facility 2, Facility 2 is protected. Four hours prior to this shift, a minor earthquake, (0.09 g ZPA) was felt. No equipment is out of service.</u></p>		
<p>Turnover:  <u>100% Power. Facility 2 is protected. RCS Boron is 35 ppm, Blend ratio is 165:1. SGBD @ 25 gpm per SG, 24E aligned to 24D, Minor earthquake about 4 hour ago. All actions for AOP 2562, Earthquake, are complete. No apparent equipment damage. No equipment OOS. Need to perform SP 2654B, Forcing Sprays.</u></p>		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (ATC) N (SRO)	Commence Forcing Sprays IAW SP 2654B.
2	SW01C	C (BOP) C (SRO)	Loss of "C" Service Water Pump.
3	FW38B	I (BOP) I (SRO)	Feedwater Heater 6A Level Transmitter, L-5043A, fails low.
4	RC05A	C (ATC) C (SRO)	Pressurizer Safety Valve, RC-200, leakage.
5	NA	R (ATC) R (SRO) N (BOP)	Plant shutdown required by Tech Specs, using AOP 2575, Rapid Downpower.
6	RC05A	M (ALL)	Pressurizer Safety Valve, RC-200, opens resulting in a LOCA and plant trip.
7	Alarm A-4 on C-01	C (ATC) C (SRO)	"A" Containment Air Cooling Fan high vibration alarm.
8	SG02A	C (All)	Tube rupture in #1 SG.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Facility: <u>MP2</u>	Scenario No.: <u>ES04LI2</u>	Op-Test No.: <u>2</u>
Examiners: _____		Operators: _____
_____		_____
_____		_____
<p>Initial Conditions: <u>1% Power, EOL, RCS Boron is 466 ppm, Equilibrium Xenon, Bus 24E is aligned to Bus 24C. SG blowdown is 40 gpm on each SG. Group 7 CEAs are at 120 steps, Facility 2 is protected. No equipment is out of service.</u></p>		
<p>Turnover:</p> <p><u>1% Power. Facility 2 is protected. RCS Boron is 466 ppm, Blend ratio is 11.8:1. SGBD @ 40 gpm per SG, 24E aligned to 24C. A snow storm is in progress with sustained winds of 20-25 mph. Need to raise power to 4%, using PMW, to commence warming the main turbine. Reactor Engineering would like to leave Group 7 CEAs at 120 steps up to 5% power to allow for better ASI control when raising power above 5%. OP 2203, Plant Startup is complete up through step 4.5.10.</u></p>		

Event No.	Malfunction No.	Event Type*	Event Description
1	N/A	N (BOP) R (ATC)	Raise power to 4%.
2	CV28A	I (ATC)	PMW Addition Valve, CH-210X, fails open.
3	CW02D	C (BOP)	"D" Circulating Water Screen D/P increases causing loss of "D" Circulating Water Pump.
4	RM01O	I (ATC)	Control Room Ventilation Radiation Monitor, RM-9799A, fails high.
5	Alarm C-8 on C-05	C (BOP)	#2 MSIV Low Air Pressure alarm on C-05.
6	MS06B MS02B	C (BOP) M (ALL)	#2 MSIV closes resulting in a plant trip and a steam line break upstream of #2 MSIV.
7	ED16B	C (ALL)	Loss of Vital Instrument Bus, VA 20.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Facility: <u>MP2</u>	Scenario No.: <u>ES04LI3</u>	Op-Test No.: <u>3</u>
Examiners: _____		Operators: _____
_____		_____
_____		_____
<p>Initial Conditions: <u>100% Power, BOL, RCS Boron is 1201 ppm, Equilibrium Xenon, Bus 24E is aligned to Bus 24C. SG blowdown is 40 gpm on each SG. Facility 1 is protected. The Turbine Driven Auxiliary Feed Pump is out of service. F-16 is out for filter replacement.</u></p>		
<p>Turnover:  <u>100% Power. RCS Boron is 1201 ppm, Equilibrium Xenon, Blend ratio is 3.4:1, SGBD @ 40 gpm per SG. Bus 24E is aligned to Bus 24C. Facility 1 is protected. The Turbine Driven Auxiliary Feed Pump is out of service. Radwaste Fan, F-16 is out for filter replacement. Containment pressure is approximately 21 inches. Containment will need to be depressurized. Steps 4.13.1 through 4.13.7 are complete in OP 2314B. Chemical use has been prohibited in the Enclosure Building for the past week.</u></p>		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (ATC)	Depressurize Containment IAW OP 2314B, Containment and Enclosure Building Purge.
2	PC01	C (ALL)	Loss of the Plant Process Computer
3	NA	R (ATC)	Restore ASI to the normal operating range using AOP 2575, Rapid Downpower to reduce power by approximately 5%
4	RP10C	I (ATC)	Channel "C" Pressurizer Pressure transmitter fails low.
5	FW33	C (ALL)	Degradation of condenser vacuum requiring a continued reduction of power using AOP 2575, Rapid Downpower.
6	FW33	M (ALL)	Loss of condenser vacuum requiring a plant trip and a loss of main feedwater.
7	ED05C	C (ALL)	Overload trip of Bus 24C resulting in a complete loss of all feedwater.
8	ES03J	C (ATC)	Failure of "C" HPSI to automatically start on SIAS resulting in loss of all HPSI Pumps.
<p>* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor</p>			

Facility: Millstone 2		Date of Exam: 3/21/05									Operating Test No.: 1					
A P P L I C A N T	E V E N T  T Y P E	Scenarios												T O T A L	M I N I M U M	
		1 ES04LI1			2 ES04LI2			3 ES04LI3			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			
RO SRO-I SRO-U	RX	1				1									2	1*
	NOR	1				0									1	1*
	I/C	5				3									8	4*
	MAJ	1				1									2	2
	TS	2				NA									2	2
RO SRO-I SRO-U	RX		1				0								1	1*
	NOR		1				1								2	1*
	I/C		3				4								7	4*
	MAJ		1				1								2	2
	TS		NA				NA								NA	2
RO SRO-I SRO-U	RX			0					1						1	1*
	NOR			1					1						2	1*
	I/C			3					5						8	4*
	MAJ			1					1						2	2
	TS			NA					NA						NA	2

Instructions:

1. Circle the applicant level and enter the operating test number and Form ES-D-1 event numbers for each evolution type; TS are not applicable for RO applicants. ROs must serve 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 requirement.

Author: Richard J. Alley

NRC Reviewer: pro At

Facility: Millstone Unit 2

Date of Examination: 3/21/05

Examination Level (circle one): RO ~~SRO~~

Operating Test Number: 1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N	<b>Validate an ECP (Faulted):</b> The examinee reviews the completed ECP and determines that there is an error. (2.1.25)
Equipment Control	N	<b>RO Tag Clearance Preparation:</b> At the completion of this JPM, the examinee will present a recommended tagging clearance to the tagging authority. (2.2.13)
Radiation Control	N	<b>Review RWP and Survey Map:</b> At the completion of this JPM the examinee has reviewed the applicable RWP and survey map to determine the radiological requirements to perform the assigned task. (2.3.10)
Emergency Plan	N	<b>Use RATS to Determine and Prioritize the Safety Functions:</b> The examinee will correctly identify and prioritize the Safety Function Success Paths. (2.4.4)

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 ( $\leq 3$  for ROs;  $\leq 4$  for SROs & RO retakes)  
 (N)ew or (M)odified from bank ( $\geq 1$ )  
 (P)revious 2 exams ( $\leq 1$ ; randomly selected)  
 (S)imulator

Facility: <u>Millstone Unit 2</u>		Date of Examination: <u>3/21/05</u>
Examination Level (circle one): <del>RO</del> / <u>(SRO)</u>		Operating Test Number: <u>1</u>
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N	<b>SRO Shift Turnover:</b> At the completion of this JPM, the SRO has performed a review of turn over documents and found incorrect information related to a shift turnover. (2.1.3)
Conduct of Operations	N	<b>SRO Tag Clearance Approval:</b> At the completion of this JPM, the examinee will have discovered that the tag out is in error. He will recommend the clearance not be approved until the Cross tie valve 2-CHW-125 is added to the clearance and the other Cross tie valve 2-CHW-124 is removed. (2.1.24)
Equipment Control	N	<b>SRO AWO Acceptance:</b> At the completion of this JPM, the examinee will recommend the correct PMT, HPSI Pump IST (SP2604A-003). (2.2.21)
Radiation Control	N	<b>SRO Review and Approve a Radioactive Liquid Waste Release Permit:</b> At the completion of this JPM, the examinee will have discovered a plant operating condition that will NOT allow authorizing a radioactive liquid waste discharge. (2.3.6)
Emergency Plan	N, S	<b>Classify the Event:</b> At the completion of this JPM, the examinee will determine the classification of the scenario to be an Alert/C1. (2.4.41)
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"> <li>(C)ontrol room</li> <li>(D)irect from bank (<math>\leq 3</math> for ROs; <math>\leq 4</math> for SROs &amp; RO retakes)</li> <li>(N)ew or (M)odified from bank (<math>\geq 1</math>)</li> <li>(P)revious 2 exams (<math>\leq 1</math>; randomly selected)</li> <li>(S)imulator</li> </ul>		

Facility: <u>Millstone Unit 2</u>		Date of Examination: <u>3/21/05</u>	
Exam Level (circle one): <u>RO / SRO(I)</u> SRO(U)		Operating Test No.: <u>1</u>	
Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)			
System / JPM Title		Type Code*	Safety Function
a.	<b>Manual Makeup to the VCT:</b> At the completion of this JPM, the examinee has recognized an inadvertent dilution in progress and recommends/secures the dilution. (004 A2.06) (RO & SRO)	A, M, S	1
b.	<b>HPSI Pump Operability Test:</b> At the completion of this JPM, the examinee has initiated Facility I HPSI pump surveillance on "A" HPSI pump and recognized the failure of the pump to start, and states that the pump has failed its surveillance and/or that it is inoperable. (006 A4.06) (RO & SRO)	A, D, S	3
c.	<b>Start 4<sup>th</sup> RCP:</b> The examinee will start the RCP, monitor critical RCP parameters including alarms and secure the RCP per OP 2301C and/or ARP 2590B-083. (003 A2.03) (RO & SRO)	A, N, L, S	4(P)
d.	<b>Perform TDAFP Operability Test:</b> Examinee completes the assigned section of 2610B and determines that the TDAFP is not operable. (061 A2.04) (RO & SRO)	A, N, S	4(S)
e.	<b>"A" DG Operability Test (Alternate Path):</b> Examinee performs the Facility 1 Diesel Generator Operability Test, SP 2613A, on the 'A' D/G, recognizes the "D/G 12U Trouble" annunciator. Upon requesting information from the PEO in the diesel room, the examinee recommends, or trips the 'A' D/G. (064 A4.01) (RO)	D, S	6
f.	<b>Power Range Safety Channel and Delta T Power Channel Calibration:</b> During the performance of SP 2601D, Power Range Safety Channel and Delta T Power Channel Calibration, the examinee determines that the -10 Volt power Supply voltage is not in the acceptable range and bypasses the channel. (012 A2.04) (RO & SRO)	A, N, S	7
g.	<b>Placing "B" RBCCW Pump and Heat Exchanger in Service and Removing "A" RBCCW Pump and Heat Exchanger:</b> During the swap of the "A" RBCCW Pump and Heat Exchanger to the "B" RBCCW Pump and Heat Exchanger, the examinee observes a problem with the "B" RBCCW Heat Exchanger and swaps back to the "A" RBCCW Heat Exchanger. (008 A2.03) (RO & SRO)	A, N, S	8



h. <b>Change the Alarm Setpoint of the SJAE RM 5099:</b> The examinee will adjust the setpoint of the Steam Jet Air Ejector Radmonitor as specified on the attached SP2833-007. (071 A4.25) (RO & SRO)	A, N, S	9
i. (SPARE) <b>Hydrogen Recombiner Surveillance:</b> At the completion of this JPM, the examinee will have "A" Hydrogen Recombiner in service in accordance with SP-2608A. (028 A4.01) (RO & SRO)	A, D, S	5
In-Plant Systems <sup>@</sup> (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)		
a. <b>Removing Section 201A-1, of Battery Charger 201A, From Service:</b> At the completion of this JPM, battery charger section 201A-1 will be removed from service in accordance with 2345C section 4.13. (063 K1.03) (RO & SRO)	E, N	6
b. <b>Local Manual Operation of the "A" Atmospheric Dump Valve:</b> Examinee has taken local manual control of the "A" ADV and placed in to 25% open per OP 2316A. (039 A2.04) (RO & SRO)	D, E, L, R	4 (S)
c. <b>Cross-Tie Station Air With Unit 3 to Supply Unit 2 Instrument Air:</b> The examinee has successfully performed the alignment to allow Unit 3 to supply Unit 2 with Station Air and to permit Station Air to supply Instrument Air. (079 A2.01) (RO & SRO)	E, L, N	8
d. (SPARE) <b>Loss of SDC / Vent the 'A' LPSI Pp.:</b> At the completion of this JPM, the examinee will have simulated venting the "A" LPSI Pp. per AOP 2572, "Loss of SDC". (005 A2.03) (RO & SRO)	N, E, L, R	4 (P)
<p>@ All Control Room (and In-Plant) systems must be different and serve different safety functions; In-Plant systems and functions may overlap those tested in the Control Room.</p>		
*Type Codes:	Criteria for RO / SRO-I / SRO-U	
(A)lternate path	4-6 / 4-6 / 2-3	
(C)ontrol room		
(D)irect from bank	≤9 / ≤8 / ≤4	
(E)mergency or abnormal in-plant,	≥1 / ≥1 / ≥1	
(L)ow-Power	≥1 / ≥1 / ≥1	
(N)ew or (M)odified from bank including 1(A)	≥2 / ≥2 / ≥1	
(P)revious 2 exams	≤3 / ≤3 / ≤2 (randomly selected)	
(R)CA	≥1 / ≥1 / ≥1	
(S)imulator		

Dominion Nuclear Connecticut, Inc.  
Millstone Power Station  
Rope Ferry Road  
Waterford, CT 06385



**Dominion**

JAN 21 2005

Mr. R. J. Conte, Chief  
Operational Safety Branch  
U.S. Nuclear Regulatory Commission  
Region I  
475 Allendale Road  
King of Prussia, PA 19406-1415

Serial No. 04-570B  
MPS Lic/BAK R0  
Docket No. 50-336  
License No. DPR-65

**DOMINION NUCLEAR CONNECTICUT, INC.**  
**MILLSTONE POWER STATION UNIT 2**  
**SENIOR REACTOR AND REACTOR OPERATOR INITIAL EXAMINATIONS**

This letter is provided in response to the request from your office, dated September 2, 2004<sup>1</sup>, to furnish by February 8, 2005, the proposed operating test and supporting documents for Senior Reactor and Reactor Operator Initial Examinations at Millstone Power Station Unit 2.

Attachment 1 of this letter transmits the operating examination materials which were developed in accordance with NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9, "Examination Standard ES-301, "Preparing Initial Operating Tests." Pursuant to 10 CFR 55.40(b)(3), an authorized station representative has approved the proposed operating tests contained in Attachment 1. Attachment 2 contains the supporting documents. The attached materials are complete and ready for use.

Consistent with the guidance contained in NUREG-1021 Examiners Standard 201, Attachment 1, the attachments should be withheld from public disclosure until after the examination has been completed. No redacted versions are being supplied.

If you have any questions or require additional information, please contact Mr. Michael J. Wilson at (860) 437-2916.

Very truly yours,

  
J. Alan Price  
Site Vice President - Millstone

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<sup>1</sup> R.J. Conte letter from the U.S. Nuclear Regulatory Commission to D.A. Christian, "Senior Reactor and Reactor Operator Initial Examinations – Millstone Unit 2," dated September 2, 2004.

Attachments: 2

Commitments made in this letter: None.

cc: w/o attachment

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Attention: Document Control Desk  
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**Attachment 1**

**SENIOR REACTOR AND REACTOR OPERATOR INITIAL EXAMINATIONS  
PROPOSED OPERATING TESTS**

**Millstone Power Station Unit 2  
Dominion Nuclear Connecticut, Inc. (DNC)**

**Attachment 2**

**SENIOR REACTOR AND REACTOR OPERATOR INITIAL EXAMINATIONS  
SUPPORTING DOCUMENTS**

**Millstone Power Station Unit 2  
Dominion Nuclear Connecticut, Inc. (DNC)**

Facility: <u>MP2</u>	Scenario No.: <u>ES04LI1</u>	Op-Test No.: <u>1</u>
Examiners: _____		Operators: _____
_____		_____
_____		_____
<p>Initial Conditions: <u>100% Power, EOL, RCS Boron is 35 ppm, Equilibrium Xenon, Bus 24E is aligned to Bus 24D. SG blowdown is 25 gpm on each SG. All swing components are aligned to Facility 2, Facility 2 is protected. Four hours prior to this shift, a minor earthquake, (0.09 g ZPA) was felt. No equipment is out of service.</u></p>		
<p>Turnover:  <u>100% Power. Facility 2 is protected. RCS Boron is 35 ppm, Blend ratio is 165:1. SGBD @ 25 gpm per SG, 24E aligned to 24D, Minor earthquake about 4 hour ago. All actions for AOP 2562, Earthquake, are complete. No apparent equipment damage. No equipment OOS. Need to perform SP 2654B, Forcing Sprays.</u></p>		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (ATC) N (SRO)	Commence Forcing Sprays IAW SP 2654B.
2	SW01C	C (BOP) C (SRO)	Loss of "C" Service Water Pump.
3	FW38B	I (BOP) I (SRO)	Feedwater Heater 6A Level Transmitter, L-5043A, fails low.
4	RC05A	C (ATC) C (SRO)	Pressurizer Safety Valve, RC-200, leakage.
5	NA	R (ALL) N (ALL)	Plant shutdown required by Tech Specs, using AOP 2575, Rapid Downpower.
6	RC05A	C (ATC) C (SRO) M (ALL)	Pressurizer Safety Valve, RC-200, opens resulting in a LOCA and plant trip.
7	Alarm A-4 on C-01	C (ATC) C (SRO)	"A" Containment Air Cooling Fan high vibration alarm.
8	SG02A	C (BOP) C (SRO) M (ALL)	Tube rupture in #1 SG.
<p>* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor</p>			

Facility: <u>MP2</u>	Scenario No.: <u>ES04LI2</u>	Op-Test No.: <u>2</u>
Examiners: _____		Operators: _____
_____		_____
_____		_____
<p>Initial Conditions: <u>1% Power, EOL, RCS Boron is 466 ppm, Equilibrium Xenon, Bus 24E is aligned to Bus 24C. SG blowdown is 40 gpm on each SG. Group 7 CEAs are at 120 steps, Facility 2 is protected. No equipment is out of service.</u></p>		
<p>Turnover:</p> <p><u>1% Power. Facility 2 is protected. RCS Boron is 466 ppm, Blend ratio is 11.8:1. SGBD @ 40 gpm per SG, 24E aligned to 24C. A snow storm is in progress with sustained winds of 20-25 mph. Need to raise power to 4%, using PMW, to commence warming the main turbine and to start a main feed pump. Reactor Engineering would like to leave Group 7 CEAs at 120 steps up to 5% power to allow for better ASI control when raising power above 5%. OP 2203, Plant Startup is complete up through step 4.3.20, establishing a condenser vacuum.</u></p>		

Event No.	Malfunction No.	Event Type*	Event Description
1	N/A	N (ALL) R (ATC)	Raise power to 4%.
2	CV28A	I (ATC)	PMW Addition Valve, CH-210X, fails open.
3	CW02D	C (BOP)	"D" Circulating Water Screen D/P increases causing loss of "D" Circulating Water Pump.
4	RM01O	I (ATC)	Control Room Ventilation Radiation Monitor, RM-9799A, fails high.
5	Alarm C-8 on C-05	C (BOP)	#2 MSIV Low Air Pressure alarm on C-05.
6	MSR16 MS02B	C (ALL) M (ALL)	#2 MSIV closes resulting in a plant trip and a steam line break upstream of #2 MSIV.
7	ED16B	C (ALL) M (ALL)	Loss of Vital Instrument Bus, VA 20.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Facility: MP2 Scenario No.: ES04LI3 Op-Test No.: 3

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_

Initial Conditions: 100% Power, BOL, RCS Boron is 1201 ppm, Equilibrium Xenon, Bus 24E is aligned to Bus 24C. SG blowdown is 40 gpm on each SG. Facility 1 is protected. The Turbine Driven Auxiliary Feed Pump is out of service.

Turnover:

100% Power. RCS Boron is 1201 ppm, Equilibrium Xenon, Blend ratio is 3.9:1, SGBD @ 40 gpm per SG. Bus 24E is aligned to Bus 24C. Facility 1 is protected. The Turbine Driven Auxiliary Feed Pump is out of service. Containment pressure is approximately 22 inches. Containment will need to be depressurized. Steps 4.13.1 through 4.13.7 are complete in OP 2314B.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (ATC)	Depressurize Containment IAW OP 2314B, Containment and Enclosure Building Purge.
2	PC01	C (ALL)	Loss of the Plant Process Computer
3	NA	R (ALL) N (ALL)	Restore ASI to the normal operating range using AOP 2575, Rapid Downpower to reduce power by approximately 5%
4	RP10C	I (ATC)	Channel "C" Pressurizer Pressure transmitter fails low.
5	FW33	C (ALL)	Degradation of condenser vacuum requiring a continued reduction of power using AOP 2575, Rapid Downpower.
6	FW33	C (ALL) M (ALL)	Loss of condenser vacuum requiring a plant trip and a loss of main feedwater.
7	ED05C	C (ALL) M (ALL)	Overload trip of Bus 24C resulting in a complete loss of all feedwater.
8	ES03J	C (ATC)	Failure of "C" HPSI to automatically start on SIAS resulting in loss of all HPSI Pumps.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			



Facility: Millstone 2		Date of Exam: 3/21/05									Operating Test No.: 1					
A P P L I C A N T	E V E N T  T Y P E	Scenarios												T O T A L	M I N I M U M	
		1 ES04LI1			2 ES04LI2			3 ES04LI3			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			
RO SRO-U	RX	1				1									2	1*
	NOR	2	1			1									3	1*
	I/C	5	8			4	5								10	4*
	MAJ	2				2									4	2
	TS	2				NA									2	2
RO SRO-I SRO-U	RX		1				NA								1	1*
	NOR		2				1								3	1*
	I/C		8	2			4	3							7	4*
	MAJ		2				2								4	2
	TS		NA				NA								NA	2
RO SRO-I SRO-U	RX			1					1						2	1*
	NOR			1					2						3	1*
	I/C			3					8	5					9	4*
	MAJ			2	1				2						4	2
	TS			NA					NA						NA	2

Instructions:

1. Circle the applicant level and enter the operating test number and Form ES-D-1 event numbers for each evolution type; TS are not applicable for RO applicants. ROs must serve 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 requirement.

Author:

Richard J. O'Leary

NRC Reviewer:

John Antonio