

**ARKANSAS NUCLEAR ONE,
UNIT 1**

**INITIAL EXAMINATIONS
DECEMBER 13-19, 1999**

OUTLINE

1999 ANO Unit One RO Examination Outline Worksheet

Based on NUREG-1021

Form ES-401-4

Rev.8

		K/A Category Points											
Tier	Group	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Point Total
Tier 1 Plant Evolutions	1	2	2	4				3	3			2	16
	2												17
	3	3	1	4				3	4			2	
	Tier Totals	6	4	8				6	8			4	36
Tier 2 Plant Systems	1	4	1	2	2	2	3	2	2	2	2	1	23
	2	2	2	2	2	1	2	2	2	2	2	1	20
	3	1	1	1	1	0	0	1	1	1	1	0	8
	Tier Totals	7	4	5	5	3	5	5	5	5	5	2	51
Tier 3 Generic	Cat1	Cat2	Cat3	Cat4									
	4	3	3	3									13

Temp Total	Average	Std. Dev.
16		
17		
3		
36	6.00	1.79
23		
20		
8		
51	4.64	1.29
13		
100	7.91	3.86

K/A Totals	13	8	13	5	3	5	11	13	5	5	6	100
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**1999 ANO Unit One RO Examination Outline
Emergency and Abnormal Plant Evolutions - Tier1/Group1**

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)K/A Topic(s)K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / I					1		005 AA2.03 Required actions if more than one rod is stuck or inoperable	3.5	1
000015/17 RCP Malfunctions / IV					1		015/017 AA2.10 When to secure RCPs on loss of cooling or seal injection	3.7	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / IV				1			B&W E09 EA1.1 Components, and functions of control and safety systems, including instrumentation signals, interlocks, failure modes, and automatic and manual features.	3.7	1
000024 Emergency Boration / I									0
000026 Loss of Component Cooling Water / VIII (Intermediate Cooling Water - ANO)			1				026 AK3.03 Guidance actions contained in EOP for Loss of CCW	4.0	1
000027 Pressurizer Pressure Control System Malfunction / III				1			027 AA1.01 PZR heaters, sprays, and PORVS	4.0	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / IV	1						B&W E05 EK1.2 Normal, abnormal and emergency operating procedures associated with Excessive Heat Transfer.	4.0	1
CE/A11; W/E08 RCS Overcooling - PTS / IV						1	2.4.1 Knowledge of EOP entry conditions and immediate action steps.	4.3	1
000051 Loss of Condenser Vacuum / IV						1	2.4.20 Knowledge of operational implications of EOP warnings, cautions, and notes.	3.3	1
000055 Station Blackout / VI					1		055 EA2.03 Actions necessary to restore power	3.9	1
000057 Loss of Vital AC Elec. Inst. Bus / VI									0
000062 Loss of Nuclear Service Water / IV			1				062 AK3.02 The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS.	3.6	1
000067 Plant Fire On-site / IX									0
000068 (BW/A06) Control Room Evac. / VIII		1					B&W A06 AK2.2 Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	4.2	1
000069 (W/E14) Loss of CTMT Integrity / V			1				069 AK3.01 Guidance contained in EOP for loss of containment integrity	3.8	1
000074 (W/E06&E07) Inad. Core Cooling / IV	1						074 EK1.03 Processes for removing decay heat from the core.	4.5	1

**1999 ANO Unit One RO Examination Outline
Emergency and Abnormal Plant Evolutions - Tier1/Group1**

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)K/A Topic(s)K/A Topic(s)	Imp.	Points
BW/E03 Inadequate Subcooling Margin / IV		1	1				B&W E03 EK2.2 Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	4.3	
							B&W E03 EK3.3 Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations.	4.4	2
000076 High Reactor Coolant Activity / IX									0
BW/A02&A03 Loss of NNI-X/Y / VII				1			B&W A02 AA1.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	4.0	1
K/A Category Totals:	2	2	4	3	3	2	Group Point Total = 16		16

1999 ANO Unit One RO Examination Outline
Emergency and Abnormal Plant Evolutions - Tier1/Group2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / I									0
000003 Dropped Control Rod / I	1						003 AK1.13 Interaction of ICS control stations as well as purpose, function, and modes of operation of ICS	3.2	1
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / I				1			B&W E10 EA1.2 Operating behavior characteristics of the facility.	3.5	1
BW/A01 Plant Runback / I				1			B&W A01 AA1.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.7	1
BW/A04 Turbine Trip / IV					1		B&W A04 AA2.1 Facility conditions, and selection of appropriate procedures during abnormal and emergency operations.	3.3	1
000008 Pressurizer Vapor Space Accident / III			1				008 AK3.03 Actions contained in EOP for PZR vapor space accident/LOCA	4.1	1
000009 Small Break LOCA / III					1		009 EA2.04 Pressurizer level	3.8	1
000011 Large Break LOCA / III			1				011 EK3.15 Criteria for shifting to recirculation mode.	4.3	1
BW/E08; W/E03 LOCA Cooldown/Depress. / IV (HPI Cooldown)		1					B&W E08 EK2.2 Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	4.0	1
000022 Loss of Reactor Coolant Makeup / II									0
000025 Loss of RHR System / IV (Decay Heat System)			1				025 AK3.02 Isolation of RHR low-pressure piping prior to pressure increase above specified level.	3.3	1
000029 Anticipated Transient w/o Scram / I			1				029 EK3.12 Actions contained in EOP for ATWS	4.4	1
000032 Loss of Source Range NI / VII									0
000033 Loss of Intermediate Range NI / VII					1		033 AA2.04 Satisfactory overlap between source-range, intermediate-range, and power-range instrumentation.	3.2	1
000037 Steam Generator Tube Leak / III						1	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.0	1
000038 Steam Generator Tube Rupture / III	1				1		038 EK1.02 Leak rate vs. pressure drop. 038 EA2.03 Which S/G is ruptured.	3.2 4.4	2

**1999 ANO Unit One RO Examination Outline
Emergency and Abnormal Plant Evolutions - Tier1/Group2**

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000054 (CE/E06) Loss of Main Feedwater / IV	1						054 AK1.01 MFW line break depressurizes the S/G (similar to a steam line break).	4.1	1
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / IV				1			B&W E04 EA1.3 Desired operating results during abnormal and emergency situations.	3.6	1
000058 Loss of DC Power / VI						1	2.4.11 Knowledge of abnormal condition procedures.	3.4	1
000059 Accidental Liquid RadWaste Rel. / IX									0
000060 Accidental Gaseous Radwaste Rel. / IX									0
000061 ARM System Alarms / VII									0
K/A Category Totals:	3	1	4	3	4	2	Group Point Total = 17		17

- W/E02 Rediagnosis & SI Termination was deleted - not applicable to ANO-1.
- W/E11 Loss of Emergency Coolant Recirc was deleted - not applicable to ANO-1.
- W/E16 High Containment Radiation was deleted - not applicable to ANO-1.
- CE/E09 Functional Recovery was deleted - not applicable to ANO-1.
- W/E04 LOCA Outside Containment was deleted - not applicable to ANO-1.

1999 ANO Unit One RO Examination Outline
Emergency and Abnormal Plant Evolutions - Tier1/Group3

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / II									0
000036 (BW/A08) Fuel Handling Accident / VIII									0
000056 Loss of Off-site Power / VI					1		056 AA2.44 Indications of loss of offsite power	4.3	1
000065 Loss of Instrument Air / VIII									0
BW/E13&E14 EOP Rules and Enclosures		1					B&W E14 EK2.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.6	1
BW/A05 Emergency Diesel Actuation / VI	1						B&W A05 AK1.3 Annunciators and conditions indicating signals, and remedial actions associated with the (Emergency Diesel Actuation).	3.8	1
BW/A07 Flooding / VIII									0
K/A Category Totals:	1	1	0	0	1	0		Group Point Total = 3	3

CE/A16 Excess RCS Leakage was deleted - not applicable to ANO-1.

W/E13 Steam Generator Over-pressure was deleted - not applicable to ANO-1.

W/E15 Containment Flooding was deleted - not applicable to ANO-1.

1999 ANO Unit One RO Examination Outline

Plant Systems - Tier2/Group1

E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic	Imp.	Points
001 Control Rod Drive					1				1			001 K5.04 Rod insertion limits. 001 A3.07 Boration/dilution	4.3 4.1	2
003 Reactor Coolant Pump									1	1		003 A3.01 Seal injection flow 003 A4.08 RCP cooling water supplies	3.3 3.2	2
004 Chemical and Volume Control				1	1			1				004 K4.03 Protection of ion exchangers (high letdown temperature will isolate ion exchangers). 004 K5.26 Relationship between VCT pressure and NPSH for charging pumps. 004 A2.11 Loss of IAS	2.8 3.1 3.6	3
013 Engineered Safety Features Actuation (ANO - ESAS)	1						1					013 K1.02 RCP. 013 A1.02 Containment pressure, temperature, and humidity.	3.2 3.9	2
015 Nuclear Instrumentation		1				1						015 K2.01 NIS channels, components, and interconnections. 015 K6.02 Discriminator/compensation circuits.	3.3 2.6	2
017 In-core Temperature Monitor (ANO - 1409 ICC Monitor Display System)						1						017 K6.01 Sensors and detectors	2.7	1
022 Containment Cooling							1			1		022 A1.04 Cooling water flow. 022 A4.03 Dampers in the CCS.	3.2 3.2	2
056 Condensate	1											056 K1.03 MFW	2.6	1
059 Main Feedwater			1					1				059 K3.02 AFW System 059 A2.12 Failure of feedwater regulating valves	3.6 3.1	2
061 Auxiliary/Emergency Feedwater	1			1							1	061 K1.07 Emergency water source 061 K4.11 Automatic level control 2.1.28 Knowledge of the purpose and function of major system components and controls.	3.6 2.7 3.2	3
068 Liquid Radwaste						1						068 K6.10 Radiation monitors	2.5	1
071 Waste Gas Disposal			1									071 K3.05 ARM and PRM systems	3.2	1
072 Area Radiation Monitoring	1											072 K1.04 Control room ventilation	3.3	1
K/A Category Totals:	4	1	2	2	2	3	2	2	2	2	1	Group Point Total = 23		23

025 Ice Condenser was deleted - not applicable to ANO-1.

1999 ANO Unit One RO Examination Outline

Plant Systems - Tier2/Group2

E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic	Imp.	Points
002 Reactor Coolant						1				1		002 K6.12 Code Safety Valves 002 A4.03 Indications and controls necessary to recognize and correct saturation conditions.	3.0 4.3	2
006 Emergency Core Cooling	1								1			006 K1.08 CVCS 006 A3.03 ESFAS-operated valves	3.6 4.1	2
010 Pressurizer Pressure Control								1				010 A2.02 Spray valve failures	3.9	1
011 Pressurizer Level Control										1		011 A4.01 Charging pump and flow controls	3.5	1
012 Reactor Protection					1				1			012 K5.01 DNB 012 A3.06 Trip logic	3.3 3.7	2
014 Rod Position Indication				1								014 K4.05 Rod hold interlocks	3.1	1
016 Non-nuclear Instrumentation											1	2.1.32 Ability to explain and apply all system limits and precautions	3.4	1
026 Containment Spray				1								026 K4.05 Prevention of material from clogging nozzles during recirculation.	2.8	1
029 Containment Purge							1					029 A1.03 Containment pressure, temperature, and humidity	3.0	1
033 Spent Fuel Pool Cooling							1					033 A1.01 Spent fuel pool water level	2.7	1
035 Steam Generator			1									035 K3.03 Secondary systems	3.0	1
039 Main and Reheat Steam	1											039 K1.02 Atmospheric relief dump valves	3.3	1
055 Condenser Air Removal			1									055 K3.05 SDS Justification for <2.5 KA: The SDS has an important plant specific priority involving the interrelationship between condenser vacuum and turbine bypass valves.	2.3	1
062 AC Electrical Distribution		1										062 K2.01 Major system loads	3.3	1
063 DC Electrical Distribution		1										063 K2.01 Major DC loads	2.9	1
064 Emergency Diesel Generator						1						064 K6.08 Fuel oil storage tanks	3.2	1
073 Process Radiation Monitoring														0
075 Circulating Water														0
079 Station Air														0
086 Fire Protection								1				086 A2.02 Low FPS header pressure	3.0	1
K/A Category Totals:	2	2	2	2	1	2	2	2	2	2	1	Group Point Total = 20	20	

1999 ANO Unit One RO Examination Outline

Plant Systems - Tier2/Group3

E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic	Imp.	Points										
005 Residual Heat Removal (Decay Heat - ANO)		1										005 K2.01RHR pumps	3.0	1										
007 Pressurizer Relief/Quench Tank							1					007 A1.01 Maintaining quench tank water level within limits	2.9	1										
008 Component Cooling Water (Intermediate Cing Wtr - ANO)								1				008 A2.05 Effect of loss of instrument and control air on the position of CCW valves that are air operated	3.3	1										
027 Containment Iodine Removal														0										
028 Hydrogen Recombiner and Purge Control														0										
034 Fuel Handling Equipment														0										
041 Steam Dump/Turbine Bypass Control									1			041 A3.05 Main steam pressure	2.9	1										
045 Main Turbine Generator				1								045 K4.13 Overspeed protection	2.6	1										
076 Service Water (and Auxiliary Cing Wtr - ANO)											1	076 A4.04 Emergency heat loads	3.5	1										
078 Instrument Air														0										
103 Containment														0										
1402 Integrated Control System (ANO)			1									015 K3.04 ICS	3.4	1										
1402 Integrated Control System (ANO)	1											059 K1.07 ICS	3.2	1										
K/A Category Totals:												1	1	1	1	0	0	1	1	1	1	0	Group Point Total = 8	
Plant-Specific Priorities																								
System / Topic	Recommended Replacement for...										Reason	Points												
1402 Integrated Control System K3	103 Containment K3										ICS is a very important system for B&W units, Containment knowledge is routinely tested at the WCO level.	1												
1402 Integrated Control System K3	027 Containment Iodine Removal K1										ICS is a very important system for B&W units, Containment knowledge is routinely tested at the WCO level.	1												
Plant-Specific Priority Total: (limit 10)														2										

1999 ANO Unit One RO Examination Outline

Generic - Tier3

E/APE # / Name / Safety Function	C1	C2	C3	C4	K/A Topic	Imp.	Points
2.1 Conduct of Operations	1				2.1.1 Knowledge of conduct of operations requirements	3.7	1
2.1 Conduct of Operations	1				2.1.29 Knowledge of how to conduct and verify valve lineups	3.4	1
2.1 Conduct of Operations	1				2.1.3 Knowledge of shift turnover practices	3.0	1
2.1 Conduct of Operations	1				2.1.11 Knowledge of less than one hour technical specification action statements for systems.	3.0	1
2.2 Equipment Control		1			2.2.13 Knowledge of tagging and clearance procedures.	3.6	1
2.2 Equipment Control		1			2.2.22 Knowledge of limiting conditions for operations and safety limits.	3.4	1
2.2 Equipment Control		1			2.2.27 Knowledge of the refueling process.	2.6	1
2.3 Radiation Control			1		2.3.1 Knowledge of 10CFR :20 and related facility radiation control requirements.	2.6	1
2.3 Radiation Control			1		2.3.2 Knowledge of facility ALARA program.	2.5	1
2.3 Radiation Control			1		2.3.4 Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1
2.4 Emergency Procedures/Plan				1	2.4.3 Ability to identify post-accident instrumentation.	3.5	1
2.4 Emergency Procedures/Plan				1	2.4.10 Knowledge of annunciator response procedures.	3.0	1
2.4 Emergency Procedures/Plan				1	2.4.11 Knowledge of abnormal condition procedures.	3.4	1
K/A Category Totals:	4	3	3	3	Group Point Total =	13	13

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Based on NUREG-1021

Form ES-401-3

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		K/A Category Points											
Tier	Group	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Point Total
Tier 1 Plant Evolutions	1	6	3	6				3	4			2	24
	2	2	2	3				3	4			2	16
	3	0	1	1				1	0			0	3
	Tier Totals	8	6	10				7	8			4	43
Tier 2 Plant Systems	1	2	2	2	3	1	3	1	1	2	1	1	19
	2	2	1	2	1	1	2	2	2	1	2	1	17
	3	0	0	0	1	0	0	1	0	0	1	1	4
	Tier Totals	4	3	4	5	2	5	4	3	3	4	3	40
Tier 3 Generic	Cat1	Cat2	Cat3	Cat4									17
	4	4	4	5									

<i>Temp Total</i>	<i>Average</i>	<i>Std. Dev.</i>
24		
16		
3		
43	7.17	2.04
19		
17		
4		
40	3.64	0.92
17		
100	7.55	4.06

K/A/G/ Totals	12	9	14	5	2	5	11	11	3	4	7
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25 SRO Only Total

1999 ANO Unit One SRO Examination Outline Worksheet
Emergency and Abnormal Plant Evolutions - Tier1/Group1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points	
000001 Continuous Rod Withdrawal / 1	1						001 AK1.04 Effect of continuous rod withdrawal on insertion limits and SDM.	3.9	1	S
000003 Dropped Control Rod / 1	1						003 AK1.13 Interaction of ICS control stations as well as purpose, function, and modes of operation of ICS	3.6	1	
000005 Inoperable/Stuck Control Rod / 1					1		005 AA2.03 Required actions if more than one rod is stuck or inoperable	4.4	1	
000011 Large Break LOCA / 3	1		1				011 EK1.01 Natural circulation and cooling, including reflux boiling. 011 EK3.15 Criteria for shifting to recirculation mode.	4.4 4.4		2 S
000015/17 RCP Malfunctions / 4					1		015/017 AA2.10 When to secure RCPs on loss of cooling or seal injection	3.7	1	
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4				1			B&W E09 EA1.1 Components, and functions of control and safety systems, including instrumentation signals, interlocks, failure modes, and automatic and manual features.	3.5	1	
000024 Emergency Boration / 1	1						024 AK3.02 Actions contained in EOP for emergency boration.	3.9	1	S
000026 Loss of Component Cooling Water / 8			1				026 AK3.03 Guidance actions contained in EOP for Loss of CCW	4.2	1	
000029 Anticipated Transient w/o Scram / 1		1					029 EK2.06 Breakers, relays, and disconnects.	3.1	1	S
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4	1						B&W E05 EK1.2 Normal, abnormal and emergency operating procedures associated with Excessive Heat Transfer.	4.2	1	
CE/A11; W/E08 RCS Overcooling - PTS / 4						1	2.4.1 Knowledge of EOP entry conditions and immediate action steps.	4.6	1	
000051 Loss of Condenser Vacuum / 4						1	2.4.20 Knowledge of operational implications of EOP warnings, cautions, and notes.	4.0	1	
000055 Station Blackout / 6				1	1		055 EA1.02 Manual ED/G start 055 EA2.03 Actions necessary to restore power	4.4 4.7		2 S
000057 Loss of Vital AC Elec. Inst. Bus / 6										0
000059 Accidental Liquid RadWaste Rel. / 9			1				059 AK3.04 Actions contained in EOP for accidental liquid radioactive-waste release	4.3	1	S

1999 ANO Unit One SRO Examination Outline Worksheet
Emergency and Abnormal Plant Evolutions - Tier1/Group1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000062 Loss of Nuclear Service Water / 4			1				062 AK3.02 The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS.	3.9	1
000067 Plant Fire On-site / 9		1					067 AK2.01 Sensors, detectors, and valves	2.5	1 S
000068 (BW/A06) Control Room Evac. / 8		1					B&W A06 AK2.2 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.		1
000069 (W/E14) Loss of CTMT Integrity / 5			1				069 AK3.01 Guidance contained in EOP for loss of containment integrity	4.2	1
000074 (W/E06&E07) Inad. Core Cooling / 4	1						074 EK1.03 Processes for removing decay heat from the core.	4.9	1
BW/E03 Inadequate Subcooling Margin / 4			1				B&W E03 EK3.3 Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations.	3.8	1
000076 High Reactor Coolant Activity / 9					1		076 AA2.02 Corrective actions required for high fission product activity in RCS.	3.4	1 S
BW/A02&A03 Loss of NNI-XY / 7				1			B&W A02 AA1.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.8	1
K/A Category Totals:	6	3	6	3	4	2	Group Point Total = 24		24

8 ST

W/E02 Rediagnosis & SI Termination was deleted - not applicable to ANO-1.

W/E04 LOCA Outside Containment was deleted - not applicable to ANO-1.

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Emergency and Abnormal Plant Evolutions - Tier1/Group2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1		1					B&W E10 EK2.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	4.0	1 S
BW/A01 Plant Runback / 1				1			B&W A01 AA1.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.7	1
BW/A04 Turbine Trip / 4					1		B&W A04 AA2.1 Facility conditions, and selection of appropriate procedures during abnormal and emergency operations.	3.7	1
000008 Pressurizer Vapor Space Accident / 3			1				008 AK3.03 Actions contained in EOP for PZR vapor space accident/LOCA	4.6	1
000009 Small Break LOCA / 3					1		009 EA2.04 Pressurizer level	4.0	1
BW/E08; W/E03 LOCA Cooldown - Depress. / 4		1					B&W E08 EK2.2 Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	4.0	1
000022 Loss of Reactor Coolant Makeup / 2									0
000025 Loss of RHR System / 4			1				025 AK3.02 Isolation of RHR low-pressure piping prior to pressure increase above specified level.	3.7	1
000027 Pressurizer Pressure Control System Malfunction / 3				1			027 AA1.01 PZR heaters, sprays, and PORVS	3.9	1
000032 Loss of Source Range NI / 7					1		032 AA2.04 Satisfactory source-range,/intermediate range overlap.	3.5	1 S
000033 Loss of Intermediate Range NI / 7									0
000037 Steam Generator Tube Leak / 3						1	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.3	1
000038 Steam Generator Tube Rupture / 3	1				1		038 EK1.02 Leak rate vs. pressure drop. 038 EA2.13 Magnitude of rupture	3.5 3.7	2 S
000054 (CE/E06) Loss of Main Feedwater / 4	1						054 AK1.01 MFW line break depressurizes the S/G (similar to a steam line break).	4.3	1

1999 ANO Unit One SRO Examination Outline Worksheet

Emergency and Abnormal Plant Evolutions - Tier1/Group2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4				1			B&W E04 EA1.3 Desired operating results during abnormal and emergency situations.	3.8	1
000058 Loss of DC Power / 6						1	2.4.11 Knowledge of abnormal condition procedures.	3.6	1
000060 Accidental Gaseous Radwaste Rel. / 9									0
000061 ARM System Alarms / 7									0
000065 Loss of Instrument Air / 8			1				065 AK3.04 Cross-over to backup instrument air supplies.	3.2	1 S
									0
K/A Category Totals:	2	2	3	3	4	2	Group Point Total = 16		16

4 ST

W/E11 Loss of Emergency Coolant Recirc was deleted - not applicable to ANO-1.

W/E16 High Containment Radiation was deleted - not applicable to ANO-1.

CE/E09 Functional Recovery was deleted - not applicable to ANO-1.

1999 ANO Unit One SRO Examination Outline Worksheet
Emergency and Abnormal Plant Evolutions - Tier1/Group3

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2									0
000036 (BW/A08) Fuel Handling Accident (Refueling Canal Level Decrease) / 8				1			B&W A08 AA1.3 Desired operating results during abnormal and emergency situations.	3.7	1 S
000056 Loss of Off-site Power / 6									0
BW/E13&E14 EOP Rules and Enclosures			1				B&W E14 EK3.2 Normal, abnormal and emergency operating procedures associated with (EOP Enclosures).	3.7	1 S
BW/A05 Emergency Diesel Actuation / 6		1					B&W A05 AK2.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.8	1 S
BW/A07 Flooding / 8									
K/A Category Totals:	0	1	1	1	0	0	Group Point Total = 3		3

3 ST

CE/A16 Excess RCS Leakage was deleted - not applicable to ANO-1.
W/E13 Steam Generator Over-pressure was deleted - not applicable to ANO-1.
W/E15 Containment Flooding was deleted - not applicable to ANO-1.

1999 ANO Unit One SRO Examination Outline Worksheet
Plant Systems - Tier2/Group1

E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic	Imp.	Points
001 Control Rod Drive					1				1			001 K5.04 Rod insertion limits. 001 A3.07 Boration/dilution	4.7 3.7	2
003 Reactor Coolant Pump									1	1		003 A3.01 Seal injection flow 003 A4.08 RCP cooling water supplies	3.2 2.9	2
004 Chemical and Volume Control				1				1				004 K4.03 Protection of ion exchangers (high letdown temperature will isolate ion exchangers). 004 A2.11 Loss of IAS	2.9 4.2	2
013 Engineered Safety Features Actuation						1						013 K6.01 Sensors and detectors	3.1	1 S
014 Rod Position Indication				1								014 K4.05 Rod hold interlocks	3.3	1
015 Nuclear Instrumentation		1										015 K2.01 NIS channels, components, and interconnections.	3.7	1
017 In-core Temperature Monitor						1						017 K6.01 Sensors and detectors	3.0	1
022 Containment Cooling							1					022 A1.04 Cooling water flow.	3.3	1
026 Containment Spray				1								026 K4.05 Prevention of material from clogging nozzles during recirculation.	3.3	1
056 Condensate	1											056 K1.03 MFW	2.6	1
059 Main Feedwater			1									059 K3.02 AFW System	3.7	1
061 Auxiliary/Emergency Feedwater											1	2.1.28 Knowledge of the purpose and function of major system components and controls.	3.3	1
063 DC Electrical Distribution		1										063 K2.01 Major DC loads	3.1	1
068 Liquid Radwaste						1						068 K6.10 Radiation monitors	2.9	1
071 Waste Gas Disposal			1									071 K3.05 ARM and PRM systems	3.2	1
072 Area Radiation Monitoring	1											072 K1.04 Control room ventilation	3.5	1
														0
K/A Category Totals:	2	2	2	3	1	3	1	1	2	1	1	Group Point Total = 19		19

025 Ice Condenser was deleted - not applicable to ANO-1.

1 ST

1999 ANO Unit One SRO Examination Outline Worksheet

Plant Systems - Tier2/Group2

E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic	Imp.	Points
002 Reactor Coolant						1					1	002 K6.02 RCP 002 A4.03 Indications and controls necessary to recognize and correct saturation conditions.	3.8 4.4	2 S
006 Emergency Core Cooling	1									1		006 K1.08 CVCS 006 A3.03 ESFAS-operated valves	3.9 4.1	2
010 Pressurizer Pressure Control								1				010 A2.02 Spray valve failures	3.9	1
011 Pressurizer Level Control										1		011 A4.01 Charging pump and flow controls	3.2	1
012 Reactor Protection				1	1							012 K4.02 Automatic reactor trip when RPS setpoints are exceeded for each RPS function; basis for each 012 K5.01 DNB	4.3 3.8	2 S
016 Non-nuclear Instrumentation											1	2.1.32 Ability to explain and apply all system limits and precautions	3.8	1
027 Containment Iodine Removal														0
028 Hydrogen Recombiner and Purge Control														0
029 Containment Purge							1					029 A1.03 Containment pressure, temperature, and humidity	3.3	1
033 Spent Fuel Pool Cooling							1					033 A1.01 Spent fuel pool water level	3.3	1
034 Fuel Handling Equipment														0
035 Steam Generator			1									035 K3.03 Secondary systems	3.1	1
039 Main and Reheat Steam	1											039 K1.02 Atmospheric relief dump valves	3.3	1
055 Condenser Air Removal			1									055 K3.05 SDS	2.6	1
062 AC Electrical Distribution		1										062 K2.01 Major system loads	3.4	1
064 Emergency Diesel Generator						1						064 K6.08 Fuel oil storage tanks	3.3	1
073 Process Radiation Monitoring														0
075 Circulating Water														0
079 Station Air														0
086 Fire Protection								1				086 A2.02 Low FPS header pressure	3.3	1
103 Containment														0
														0
K/A Category Totals:	2	1	2	1	1	2	2	2	1	2	1	Group Point Total = 17		17

2 ST

1999 ANO Unit One SRO Examination Outline Worksheet

Plant Systems - Tier2/Group3

E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic	Imp.	Points
005 Residual Heat Removal											1	2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1
007 Pressurizer Relief/Quench Tank							1					007 A1.01 Maintaining quench tank water level within limits	3.1	1
008 Component Cooling Water														0
041 Steam Dump/Turbine Bypass Control														0
045 Main Turbine Generator				1								045 K4.13 Overspeed protection	2.8	1
076 Service Water											1	076 A4.04 Emergency heat loads	3.5	1
078 Instrument Air														0
														0
														0
K/A Category Totals:	0	0	0	1	0	0	1	0	0	1	1	Group Point Total = 4		4

Plant-Specific Priorities			
System / Topic	Recommended Replacement for...	Reason	Points
Plant-Specific Priority Total: (limit 10)			

1 ST

1999 ANO Unit One SRO Examination Outline Worksheet

Generic - Tier3

E/APE # / Name / Safety Function	C1	C2	C3	C4	K/A Topic	Imp.	Points
2.1 Conduct of Operations	1				2.1.1 Knowledge of conduct of operations requirements	3.8	1
2.1 Conduct of Operations	1				2.1.29 Knowledge of how to conduct and verify valve lineups	3.3	1
2.1 Conduct of Operations	1				2.1.3 Knowledge of shift turnover practices	3.4	1
2.1 Conduct of Operations	1				2.1.11 Knowledge of less than one hour technical specification action statements for systems.	3.8	1
2.2 Equipment Control		1			2.2.13 Knowledge of tagging and clearance procedures.	3.8	1
2.2 Equipment Control		1			2.2.22 Knowledge of limiting conditions for operations and safety limits.	4.1	1
2.2 Equipment Control		1			2.2.29 Knowledge of SRO fuel handling responsibilities.	3.8	1 S
2.2 Equipment Control		1			2.2.8 Knowledge of the process for determining if the proposed change, test, or experiment involves an unreviewed safety question.	3.3	1 S
2.3 Radiation Control			1		2.3.1 Knowledge of 10CFR :20 and related facility radiation control requirements.	3.0	1
2.3 Radiation Control			1		2.3.2 Knowledge of facility ALARA program.	2.9	1
2.3 Radiation Control			1		2.3.4 Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	3.1	1
2.3 Radiation Control			1		2.3.6 Knowledge of the requirements for reviewing and approving release permits.	3.1	1 S
2.4 Emergency Procedures/Plan				1	2.4.40 Knowledge of SRO's responsibilities in emergency plan implementation.	4.0	1 S
2.4 Emergency Procedures/Plan				1	2.4.10 Knowledge of annunciator response procedures.	3.1	1
2.4 Emergency Procedures/Plan				1	2.4.11 Knowledge of abnormal condition procedures.	3.6	1
2.4 Emergency Procedures/Plan				1	2.4.29 Knowledge of the emergency plan.	4.0	1 S
2.4 Emergency Procedures/Plan				1	2.4.44 Knowledge of emergency plan protective action plan recommendations.	4.0	1 S
K/A Category Totals:	4	4	4	5	Group Point Total = 17		17

6 ST

Facility: ANO UNIT 1

Date of Examination: 12-13-99

Exam Level (circle one): RO / SRO(I) **SRO(U)**

Operating Test No.: 1

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. ANO-1-JPM-R0-EDG04 Emergency Diesel Generators/Load EDG1	D/S/A	6
b. ANO-1-JPM-R0-RBC02 Containment System/Depressurize the Reactor Building	N/S	5
c. ANO-1-JPM-R0-RCP05 Reactor Coolant Pump System/Shutdown P-32C & D after DH in service	N/S/L	4 (Primary)

B.2 Facility Walk-Through

a. ANO-1-JPM-R0-AOP14 Control Room Evacuation/RO #1 Alt S/D follow-up actions immediate evacuation, Section 1C	D/R/A	2
b. ANO-1-JPM-R0-EFW01 Emergency Feedwater/Manual Reset of P-7A Overspeed Trip Mechanism	D/R	4 (Secondary)

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: <u>ANO UNIT 1</u>		Date of Examination: <u>12-13-99</u>
Exam Level (circle one): RO <u>(SRO(I))</u> / SRO(U)		Operating Test No.: <u>1</u>
B.1 Control Room Systems		
System / JPM Title	Type Code*	Safety Function
a. ANO-1-JPM-R0-CRD03 Control Rod Drive/Transfer Group 4 to Aux Power Supply	D/S/A	1
b. ANO-1-JPM-R0-EOP16 Perform Actions to Correct Overcooling (TBVs)	D/S/A	4 (Secondary)
c. ANO-1-JPM-R0-PZR03 Respond to Relief Valve Open Annunciator	D/S	3
d. ANO-1-JPM-R0-RCP05 Reactor Coolant Pump System/Shutdown P-32C & D after DH in service	N/S/L	4 (Primary)
e. ANO-1-JPM-R0-RBC02 Containment System/Depressurize the Reactor Building	N/S	5
f. ANO-1-JPM-R0-EDG04 Emergency Diesel Generators/Load EDG1	D/S/A	6
g. ANO-1-JPM-R0-RPS02 Reactor Protection/Remove Channel from Manual Bypass	D/S	7
B.2 Facility Walk-Through		
a. ANO-1-JPM-R0-AOP14 Control Room Evacuation/RO #1 Alt S/D follow-up actions immediate evacuation, Section 1C	D/R/A	2
b. ANO-1-JPM-R0-ED026 AC Electrical Distribution System/Shutdown Inverter Y22 with RS2 supplied from Y25	D	6
c. ANO-1-JPM-R0-EFW01 Emergency Feedwater/Manual Reset of P-7A Overspeed Trip Mechanism	D/R	4 (Secondary)
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA		

Facility: <u>ANO UNIT 1</u>		Date of Examination: <u>12-13-99</u>
Exam Level (circle one): <u>RO</u> / SRO(I) / SRO(U)		Operating Test No.: <u>1</u>
B.1 Control Room Systems		
System / JPM Title	Type Code*	Safety Function
a. ANO-1-JPM-R0-CRD03 Control Rod Drive/Transfer Group 4 to Aux Power Supply	D/S/A	1
b. ANO-1-JPM-R0-EOP16 Perform Actions to Correct Overcooling (TBVs)	D/S/A	4 (Secondary)
c. ANO-1-JPM-R0-PZR03 Respond to Relief Valve Open Annunciator	D/S	3
d. ANO-1-JPM-R0-RCP05 Reactor Coolant Pump System/Shutdown P-32C & D after DH in service	N/S/L	4 (Primary)
e. ANO-1-JPM-R0-RBC02 Containment System/Depressurize the Reactor Building	N/S	5
f. ANO-1-JPM-R0-EDG04 Emergency Diesel Generators/Load EDG1	D/S/A	6
g. ANO-1-JPM-R0-RPS02 Reactor Protection/Remove Channel from Manual Bypass	D/S	7
B.2 Facility Walk-Through		
a. ANO-1-JPM-R0-AOP14 Control Room Evacuation/RO #1 Alt S/D follow-up actions immediate evacuation, Section 1C	D/R/A	2
b. ANO-1-JPM-R0-ED026 AC Electrical Distribution System/Shutdown Inverter Y22 with RS2 supplied from Y25	D	6
c. ANO-1-JPM-R0-EFW01 Emergency Feedwater/Manual Reset of P-7A Overspeed Trip Mechanism	D/R	4 (Secondary)
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA		

Facility: ANO UNIT 1

Date of Examination: 12-13-99

Exam Level (circle one): RO / SRO(I) / SRO(U)

Operating Test No.: 2

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
d. ANO-1-JPM-R0-DHR03 Residual Heat Removal System/Establish DHR using P-34A	D/S/A/L	4 (Primary)
b. ANO-1-JPM-R0-EDG03 Emergency Diesel Generators/Shutdown EDG1 (no ES signal present)	D/S/A	6
g. ANO-1-JPM-R0-QT002 Pressurizer Relief Tank/Quench Tank System/Reduce Quench Tank Pressure	N/S	5

B.2 Facility Walk-Through

a. ANO-1-JPM-R0-AOP23 Control Room Evacuation/Take manual control of ADV following an Alternate Shutdown	D	4 (Secondary)
b. ANO-1-JPM-R0-FP002 Reset and place Reserve Halon Bank for Control Room Ceiling in Service	D/R	8

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: ANO UNIT 1Date of Examination: 12-13-99Exam Level (circle one): RO (SRO(I)) SRO(U)Operating Test No.: 2

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. ANO-1-JPM-R0-PZR02 Pressurizer Pressure Control System/Equalize RCS/PZR Boron	D/S/A	3
b. ANO-1-JPM-R0-CF003 Vent CFT to within Tech Spec Limits	N/S	2
c. ANO-1-JPM-R0-EOP07 Perform Reactor Trip Immediate Actions (2 Rods Stuck, Emergency Boration)	D/S/A	1
d. ANO-1-JPM-R0-DHR03 Residual Heat Removal System/Establish DHR using P-34A	D/S/A/L	4 (Primary)
e. ANO-1-JPM-R0-MFW03 Main Feedwater System/Shutdown MFWP	N/S/L	4 (Secondary)
f. ANO-1-JPM-R0-EDG03 Emergency Diesel Generators/Shutdown EDG1 (no ES signal present)	D/S/A	6
g. ANO-1-JPM-R0-QT002 Pressurizer Relief Tank/Quench Tank System/Reduce Quench Tank Pressure	N/S	5

B.2 Facility Walk-Through

a. ANO-1-JPM-R0-AOP23 Control Room Evacuation/Take manual control of ADV following an Alternate Shutdown	D	4 (Secondary)
b. ANO-1-JPM-R0-MUP05 Reactor Coolant Pump/Restore Seal Injection Flow	D/R	4 (Primary)
c. ANO-1-JPM-R0-ED010 D.C. Electrical Distribution/Place Battery Charger "DO3A" in Service	D	6

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: ANO UNIT 1 Date of Examination: 12-13-99
 Exam Level (circle one): RO / SRO(I) / SRO(U) Operating Test No.: 2

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. ANO-1-JPM-R0-PZR02 Pressurizer Pressure Control System/Equalize RCS/PZR Boron	D/S/A	3
b. ANO-1-JPM-R0-CF003 Vent CFT to within Tech Spec Limits	N/S	2
c. ANO-1-JPM-R0-EOP07 Perform Reactor Trip Immediate Actions (2 Rods Stuck, Emergency Boration)	D/S/A	1
d. ANO-1-JPM-R0-DHR03 Residual Heat Removal System/Establish DHR using P-34A	D/S/AL	4 (Primary)
e. ANO-1-JPM-R0-MFW03 Main Feedwater System/Shutdown MFWP	N/S/L	4 (Secondary)
f. ANO-1-JPM-R0-EDG03 Emergency Diesel Generators/Shutdown EDG1 (no ES signal present)	D/S/A	6
g. ANO-1-JPM-R0-QT002 Pressurizer Relief Tank/Quench Tank System/Reduce Quench Tank Pressure	N/S	5

B.2 Facility Walk-Through

a. ANO-1-JPM-R0-AOP23 Control Room Evacuation/Take manual control of ADV following an Alternate Shutdown	D	4 (Secondary)
b. ANO-1-JPM-R0-MUP05 Reactor Coolant Pump/Restore Seal Injection Flow	D/R	4 (Primary)
c. ANO-1-JPM-R0-ED010 D.C. Electrical Distribution/Place Battery Charger "DO3A" in Service	D	6

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: <u>ANO Unit 1</u>		Date of Examination: <u>12-13-99</u>
Examination Level (circle one): RO / (SRO)		Operating Test Number: <u>1</u>
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Conduct of Operations 2.1.12/2.1.25	Ability to apply technical specifications for a system. (OPEN REFERENCE QUESTION – SRO 1-1)
		Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data. (OPEN REFERENCE QUESTION – SRO 1-2)
	Conduct of Operations 2.1.16	Ability to operate plant phone, paging system, and two-way radio. NEW ADMIN JPM (ANO-1-JPM-SRO-RADIO)
A.2	Equipment Control 2.2.19	Knowledge of maintenance work order requirements. NEW ADMIN JPM (ANO-1-JPM-SRO-MAI01)
A.3	Radiation Control 2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. NEW ADMIN JPM (ANO-1-JPM-SRO-RAD1)
A.4	Emergency Procedures/Plan 2.4.41	Knowledge of the emergency action level thresholds and classifications. NEW ADMIN JPM (ANO-1-JPM-SRO-EAL2)

Facility: <u>ANO Unit 1</u>		Date of Examination: <u>12-13-99</u>
Examination Level (circle one): <u>RO</u> SRO		Operating Test Number: <u>1</u>
Administrative Topic/Subject Description	Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions	
A.1	Conduct of Operations 2.1.25	Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data. NEW ADMIN JPM (ANO-1-JPM-RO-SURV-1)
	Conduct of Operations 2.1.32/2.1.19	Ability to explain and apply all system limits and precautions. (OPEN REFERENCE QUESTION – RO 1-1) Ability to use plant computer to obtain and evaluate parametric information on system or component status. (OPEN REFERENCE QUESTION – RO 1-2)
A.2	Equipment Control 2.2.13	Knowledge of tagging and clearance procedures. NEW ADMIN JPM (ANO-1-JPM-RO-CLER-1)
A.3	Radiation Control 2.3.11	Ability to control radiation releases. NEW ADMIN JPM (ANO-1-JPM-RO-RAD-1)
A.4	Emergency Procedures/Plan 2.4.27	Knowledge of fire in the plant procedure. NEW ADMIN JPM (ANO-1-JPM-RO-FPS-1)

Facility: <u>ANO Unit 1</u>		Date of Examination: <u>12-13-99</u>
Examination Level (circle one): RO / (SRO)		Operating Test Number: <u>2</u>
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Conduct of Operations 2.1.12/2.1.25	Ability to apply technical specifications for a system. (OPEN REFERENCE QUESTION – SRO 2-1)
		Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data. (OPEN REFERENCE QUESTION – SRO 2-2)
	Conduct of Operations 2.1.18	Ability to make accurate, clear and concise logs, records, status boards, and reports. NEW ADMIN JPM (ANO-1-JPM-SRO-STATUS)
A.2	Equipment Control 2.2.19	Knowledge of maintenance work order requirements. NEW ADMIN JPM (ANO-1-JPM-SRO-MAI02)
A.3	Radiation Control 2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. NEW ADMIN JPM (ANO-1-JPM-SRO-RAD2)
A.4	Emergency Procedures/Plan 2.4.41	Knowledge of the emergency action level thresholds and classifications. NEW ADMIN JPM (ANO-1-JPM-SRO-EAL3)

Facility: <u>ANO Unit 1</u>		Date of Examination: <u>12-13-99</u>
Examination Level (circle one): <u>RO</u> SRO		Operating Test Number: <u>2</u>
Administrative Topic/Subject Description	Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions	
A.1	Conduct of Operations 2.1.25	Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data. NEW ADMIN JPM (ANO-1-JPM-RO-SURV-2)
	Conduct of Operations 2.1.32/2.1.19	Ability to explain and apply all system limits and precautions. (OPEN REFERENCE QUESTION – RO 2-1) Ability to use plant computer to obtain and evaluate parametric information on system or component status. (OPEN REFERENCE QUESTION – RO 2-2)
A.2	Equipment Control 2.2.13	Knowledge of tagging and clearance procedures. NEW ADMIN JPM (ANO-1-JPM-RO-CLER-2)
A.3	Radiation Control 2.3.11	Ability to control radiation releases. NEW ADMIN JPM (ANO-1-JPM-RO-RAD-2)
A.4	Emergency Procedures/Plan 2.4.27	Knowledge of fire in the plant procedure. NEW ADMIN JPM (ANO-1-JPM-RO-FPS-2)

Facility: ANO-1	Scenario No: <u>3</u>	Op-Test No: <u>2</u>
Examiners: _____	Operators: _____	

Objectives:

- Evaluate usage of the EOP for Rx. Trip immediate and follow-up actions
- Evaluate usage of the EOP for actions required for ESAS actuation
- Evaluate usage of the EOP for actions required for Loss of Subcooling Margin
- Evaluate usage of the AOP for actions required for a Loss of reactor coolant makeup
- Evaluate usage of the AOP for actions required for RCP pump and motor emergencies.

Initial Conditions:

- 100% Power, equilibrium xenon
- RPS is failed and will not cause an automatic trip
- ESAS channels 1 and 2 are failed and will not auto actuate at setpoint

Turnover:

- 100% power, steady state, equilibrium xenon
- AO washing travelling screens due to mild shad run. No apparent urgency for emergency measures.

Event No.	Malfunction No.	Event Type*	Event Description
1	TR589 520 R5:00	I (BOR)	"A" loop Tc instrument, TT1015, fails low slowly.
2	CV095	C (BOT) N (BOR)	"A" HPI pump (normal makeup pump) bearing heats up
3	CV018	C (BOT) R (BOR)	"D" RCP first stage seal fails
4	IOR -DI 152- 24/CS_T True	C (BOT)	Loss of bus "H-2" caused by Unit Aux. Feeder Breaker trip when P32D is stopped
5	RP246 RP247 RP249	C (BOR)	Reactor Protection System fails to automatically trip when Power/Pumps trip setpoint is reached
6	RC005 .007 R0 D0	M (All)	LOCA in the "A" RCS loop (Tc).
7	ES259 ES260	C (BOR)	ESAS channels 1 and 2 fail to automatically actuate at RCS pressure setpoint

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent (M)ajor

Facility: ANO-1	Scenario No: <u>4</u>	Op-Test No: <u>2</u>	
Examiners: _____	Operators: _____		
<p>Objectives:</p> <ul style="list-style-type: none"> • Evaluate usage of EOP for the actions required for Degraded Power condition • Evaluate usage of EOP for Reactor Trip immediate and follow-up actions • Evaluate usage of the AOP for actions required for Control Rod Malfunction • Evaluate usage of the AOP for actions required for Rapid Plant Shutdown • Evaluate the performance for ICS input failures 			
<p>Initial Conditions:</p> <ul style="list-style-type: none"> • #1 EDG fails to autostart • #1 EDG pushbutton on C10 is failed • Group 7 Rod 3 rod motion is degraded 			
<p>Turnover:</p> <ul style="list-style-type: none"> • 100% power • AAC generator reported OOS by Unit 2. Maintenance performing required planned maintenance. • Both Unit 1 EDGs operable as checked by reviewing latest surveillance tests. 			
Event No.	Malfunction No.	Event Type*	Event Description
1	TR565 620 R5:00	I (BOR)	"T _n " Instrument fails high over five minute period
2	EDB5106 Out EDB5110 Out	R (BOR) N (BOT)	EOC dispatcher requests unit to reduce power to 600MWe in the next 15 minutes due to a loss of a 500 Kv distribution line to Mablevale.
3	RD405 50	C (BOR)	Group 7 Rod 3 lags behind remainder of group rods during power reduction
4	RD293 0	C (BOR)	Group 7 Rod 3 drops into the core due to stator failure. Plant runback occurs
5	RD303 0	C (BOR)	Group 7 Rod 6 drops into the core. (Second dropped rod; requires manual reactor trip)
6	ED180	C (BOT) M (All)	Startup transformer #1 fails causing a degraded power condition.
7	IOR -DI CSI- DG1_S FALSE EG175	C (BOT)	#1 EDG fails to autostart. Manual start at C10 fails. #1 EDG can be started locally.
8	FW076	C (BOR)	P7A trips after auto-actuation

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent (M)ajor

Facility: ANO-1	Scenario No: 1	Op-Test No: 1
Examiners:	Operators:	
_____	_____	
_____	_____	

Objectives:

- Evaluate Reactor Trip immediate and follow-up actions.
- Evaluate the use of EOP for Steam Generator Tube Rupture.
- Evaluate the usage of the AOP for Steam Generator Tube Leakage.
- Evaluate the performance in response to pressurizer systems failures.
- Evaluate the performance of shifting service water pump configuration.

Initial Conditions:

- 100% MOL, equilibrium Xenon
- P4A and P4C in service
- P4B MOD aligned to A-4
- Sluice gates SG-1, SG-2, SG-4 open

Turnover:

- 100% Power, equilibrium Xenon,
- "A" service water strainer approaching 8 psid as reported by Auxiliary Operator
- Severe thunderstorm warning for Pope, Johnson, and Logan counties (All notifications/verifications have been made)

Event No.	Malfunction No.	Event Type*	Event Description
1	N/A	N (BOT)	Shift service water pumps to "B" and "C" running to allow for maintenance to clean the discharge strainer.
2	TR458 2300 R120 D0 2155	I (BOR)	RCS controlling pressure transmitter, PT1021, slowly fails to 2300 psig.
3	IOR -DO HS1008_R False ICM CV1008_a .15	C (BOR)	PZR spray valve leaks by with closed indication.
4	FW087	C (BOT) R (BOR)	Heater Drain Pump, P8B, motor bearing heatup/trip
5	RX150	I (BOT)	Turbine EHC stops responding in ICS Auto mode
6	RC001 .008	R (BOT) C (All)	"A" OTSG small tube leak resulting in rapid plant shutdown with the turbine in the leading mode (manual).
7	RC001 .25	M (All) C (All)	"A" OTSG tube rupture
8	TR575 0	I (BOR)	"B" OTSG start-up level transmitter, LT2613, fails low causing overfeed of the "B" OTSGce

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent (M)ajor

Facility: ANO-1

Scenario No: 2

Op-Test No: 1

Examiners: _____

Operators: _____

Objectives:

- Evaluate Reactor trip immediate and follow-up actions
- Evaluate usage of EOP actions for ESAS
- Evaluate usage of EOP actions for Overcooling
- Evaluate usage of AOP actions for Loss of Steam Generator feed
- Evaluate usage of AOP actions for Rapid Plant Shutdown
- Evaluate usage of AOP actions for Loss of Neutron Flux

Initial Conditions:

- 100% power
- RPS is failed and will not cause an automatic trip
- Reactor trip pushbutton is failed
- ESAS channels 5 and 6 will fail to auto actuate (Manual actuation using pushbuttons on C04 will function correctly)
- "A" MFP STBY oil pump failed and will not start automatically or manually
- Service water discharge to ECP open; return to lake closed

Turnover:

- 100% power
- Service water being returned to the ECP to makeup for low level
- Bulk diesel fuel oil is being unloaded at the fuel vault.

Event No.	Malfunction No.	Event Type*	Event Description
1	N/A	N (BOR)	Chemistry reports backup boron samples indicate pressurizer boron 55 ppm greater than RCS boron. Crew must equalize boron per normal operations procedures.
2	NI240	I (BOR) R (BOR)	Nuclear instrumentation drifts high, resulting in power reduction
3	EG172	C (BOT)	Main Generator automatic voltage regulator fails high
4	P26A_a 0 CV2827_a .95	C (BOT)	"A" MFP trips due to a loss of lube oil pump. Main feedwater cross-tie valve fails to open completely.
5	TR051 320 R2:00	I (BOR)	Selected Pressurizer level transmitter fails high
6	MS131 .4 R4:00	M (All) R (BOR)	"A" Main steam line rupture inside containment. Requires Rapid Plant Shutdown/Rx. Trip
7	RP246 RP247 RP249 ICC0020	C (BOR)	Reactor Protection System will fail to trip when any trip setpoint is reached. Reactor Trip pushbutton on C04 fails to trip the reactor
8	ES263 ES264	C (BOR)	ES channels 5 and 6 fail to auto actuate when trip setpoint is reached

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent (M)ajor