

Facility: <u>FENOC BVPS Unit 1</u>		Date of Examination: <u>8/6/01</u>
Examination Level (circle one): <b>RO</b>		Operating Test Number: <u>1LOT4</u>
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Conduct of Operations	<p align="center"><b>Verify Natural Circulation Flow [JPM]</b></p> <p align="center">K/A 193008 K1.21    3.9</p> <p align="center">K/A 2.1.7    3.7</p>
	Conduct of Operations	<p align="center"><b>Perform QPTR Calculation [JPM]</b></p> <p align="center">K/A 015 A1.04    3.5</p> <p align="center">K/A 015 A4.02    3.9</p>
A.2	Equipment Control	<p align="center"><b>Prepare a Clearance Tagout [JPM]</b></p> <p align="center">K/A 2.2.13    3.6</p>
A.3	Radiation Control	<p align="center"><b>Determine 10CR20 Exposure Limits [Q]</b></p> <p align="center">K/A 2.3.1    2.6</p>
		<p align="center"><b>Knowledge of Radiological Key Control [Q]</b></p> <p align="center">K/A 2.3.2    2.5</p>
A.4	Emergency Preparedness	<p align="center"><b>Knowledge of ERO Responsibilities [Q]</b></p> <p align="center">K/A 2.4.12    3.4</p>
		<p align="center"><b>Knowledge of Response Facilities Activation [Q]</b></p> <p align="center">K/A 2.4.29    2.6</p>

Facility: <u>FENOC BVPS Unit 1</u>		Date of Examination: <u>8/6/01</u>
Examination Level (circle one): <b>SRO</b>		Operating Test Number: <u>1LOT4</u>
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Conduct of Operations	<b>Verify Natural Circulation Flow [JPM]</b>  K/A 193008 K1.21 4.2  K/A 2.1.7 4.4
	Conduct of Operations	<b>Perform an ECP Calculation [JPM]</b>  K/A 192008 K1.07 3.6  K/A 2.1.23 4.0
A.2	Equipment Control	<b>Review a Clearance Tagout [JPM]</b>  K/A 2.2.13 3.8
A.3	Radiation Control	<b>Determine 10CFR20 Exposure Limits [Q]</b>  K/A 2.3.1 3.0
		<b>Knowledge of Radiological Key Control [Q]</b>  K/A 2.3.2 2.9
A.4	Emergency Preparedness	<b>Classify an EPP Event [JPM]</b>  K/A 2.4.41 4.1

Facility: FENOC BVPS Unit 1		Date of Examination: <u>8/6/01</u>
Exam Level (circle one): RO / SRO(I) / SRO(U)		Operating Test No.: <u>1LOT4</u>
B.1 Control Room Systems		
System / JPM Title	Type Code*	Safety Function
b. Start 1RC-P-1A, 'A' Reactor Coolant Pump	D, A, S, L	4
b. Fill 1SI-TK-1A, Accumulator 1A	D, S	2
c. Emergency Borate Reactor Coolant System	D, A, S	1
d. Manually Actuate CIB	D, A, S	5
e. <del>Offsite to Onsite Power Breaker Alignment Verification</del> <sup>TF</sup> Synchronize the Main Generator <sub>8/3/01</sub>	N, S	6
f. <del>LHSI Boric Acid Flow Path Verification</del> <sup>TF</sup> Depressurize the RCS using PORVs <sub>8/3/01</sub>	N, S, <sup>TF</sup> <sub>8/3/01</sub>	3
g. Secure Unnecessary Auxiliary Feedwater Pumps	D, S	4
B.2 Facility Walk-Through		
a. Start the Hydrogen Recombiners	D, R	5
b. Locally Start the No. 1 EDG	D, A	6
c. Locally Makeup to the Spent Fuel Pool	D	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: FENOC BVPS Unit 1 Scenario No.: 1 Op-Test No.: 1LOT4

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

Initial Conditions: IC-187.

Turnover: The plant is at 27% power, Equilibrium Xe, BOL, RCS boron at 1550 PPM. CB 'D' is at 145 steps. FW-P-3A is OOS and will not be returned this shift. The #1 EDG is OOS and will not be returned this shift. Severe thunderstorms are forecasted.

Event No.	Malfunction No.	Event Type*	Event Description
0	N/A	N/R	Raise power to 100%.
1	PRS08D	I	PZR pressure transmitter PT-RC-444 fails high.
2	MSS16B	I	SG control pressure transmitter fails low.
3	SIS05A	C	Running charging pump trips, manually start STBY pump.
4	RCS10A RCS05A	C	RCP 1A high vibration with slow increase in #1 seal leakoff flow.
5	CRF12A CRF12B	C	ATWS, reactor trip failure, both automatic & manual, FR-S.1 required.
6	INH20 INH21 INH35	C	AFW pumps fail to start automatically, can be started manually.
7	MSS01B	M	"B" SG steam break in CNMT. Steam break occurs after transition back to E-0 from FR-S.1.

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

Facility: <u>FENOC BVPS Unit 1</u>	Scenario No.: <u>2</u>	Op-Test No.: <u>1LOT4</u>	
Examiners: _____	Operators: _____	_____	
_____	_____	_____	
Initial Conditions: IC-171.			
Turnover: The plant is at 75% power, Equilibrium Xe, BOL, RCS boron at 1346 PPM. CB 'D' is at 181 steps. FW-P-3A is OOS and will not be returned this shift. The #1 EDG is OOS and will not be returned this shift. Severe thunderstorms are forecasted.			
Event No.	Malfunction No.	Event Type*	Event Description
0	N/A	N/R	Raise power to 100%.
1	RCS03A	C	Small tube leak SG "A". Plant remains on line.
2	CHS20B	I	VCT level transmitter fails high.
3	TUR18A	I	Selected 1 <sup>st</sup> stage pressure transmitter fails low.
4	FWM09A MAL05	C	Main feed reg. valve oscillates in automatic, can be controlled in manual.
5	TUR15	M	Load rejection due to governor valve position limiter failure.
6	EPS18	C/M	Main transformer failure causes generator/turbine and reactor trip. Automatic reactor trip fails, manual trip functions, FW-P-3B fails and cannot be started, FW-P-2 trips on S/U but can be reset.
7	MSS18C	M	Main steam line break "C" SG outside CNMT, upstream of MSIV. Auto SI fails, manual SI functions.

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

Facility: FENOC BVPS UNIT 1		Date of Exam: 8/06/01					Exam Level: RO						
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	2	1	5				3	4			1	16
	2	3	3	4				4	2			1	17
	3	1	0	1				1	0			0	3
	Tier Totals	6	4	10				8	6			2	36
2. Plant Systems	1	3	0	2	4	1	1	4	4	2	1	1	23
	2	3	1	2	2	1	1	0	3	2	4	1	20
	3	1	1	1	0	0	0	0	2	1	2	0	8
	Tier Totals	7	2	5	6	2	2	4	9	5	7	2	51
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		13
					4		4		2		3		
<p>Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p>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 <math>\pm 1</math> from that specified in the table based on NRC revisions. The final exam must total 100 points.</p> <p>3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>6.* The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p>													

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1							Form ES-401-4	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1									
000015/17 RCP Malfunctions / 4		1					AK2.07 Interrelationship between RCP malfunctions and RCS seals	2.9	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4									
000024 Emergency Boration / 1					2		AA2.02 Use of manual boration valve	3.9	1
000026 Loss of Component Cooling Water / 8					26		AA2.02 Cause of possible CCW loss	2.9	1
000027 Pressurizer Pressure Control System Malfunction / 3	27					99	AK1.02/2.1.32 Expansion of liquid/PZR P&L	2.8/3.4	2
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4				28			AA1.04 Isolation of main steam lines	4.3	1
CE/A11; W/E08 RCS Overcooling - PTS / 4					3		EA2.2 Adherence to procedures and operation within limits	3.5	1
*000051 Loss of Condenser Vacuum / 4			29				AK3.01 Steam dump vacuum	2.8	1
000055 Station Blackout / 6			30		31		EK3.02/EA2.03 Actions for loss of power / Actions to restore power	4.3/3.9	2
*000057 Loss of Vital AC Elec. Inst. Bus / 6			32				AK3.01 Actions for loss of instrument bus	4.1	1
*000062 Loss of Nuclear Service Water / 4			34				AK3.03 Actions for loss of service water	4.0	1
000067 Plant Fire On-site / 9	35						AK1.02 Fire fighting	3.1	1
000068 (BW/A06) Control Room Evac. / 8			36				AK3.18 Actions for control room evacuation	4.2	1
000069 (W/E14) Loss of CTMT Integrity / 5				37			AA1.01 Monitor isolation valves	3.5	1
000074 (W/E06&E07) Inad. Core Cooling / 4				38			EA1.06 Operate RCPs	3.6	1
BW/E03 Inadequate Subcooling Margin / 4									
*000076 High Reactor Coolant Activity / 9									
BW/A02&A03 Loss of NNI-XY / 7									
K/A Category Totals:	2	1	5	3	4	1	Group Point Total:		16

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ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2						Form ES-401-4		
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1									
000003 Dropped Control Rod / 1									
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1									
BW/A01 Plant Runback / 1									
BW/A04 Turbine Trip / 4									
000008 Pressurizer Vapor Space Accident / 3			39				AK3.02 PORV/Code safety exit temperature	3.6	1
000009 Small Break LOCA / 3				40			EA1.01 Monitor RCS press./temp.	4.4	1
000011 Large Break LOCA / 3		41					EK2.02 LOCA and pump relationship	2.6	1
W/E04 LOCA Outside Containment / 3				42			EA1.1 Components and Functions	4.0	1
BW/E08; W/E03 LOCA Cooldown/Depress. / 4				4			EA1.2 Operating characteristics of facility	3.7	1
W/E11 Loss of Emergency Coolant Recirc. / 4					43		EA2.2 Adherence to procedures	3.4	1
W/E01 & E02 Rediagnosis & SI Termination / 3									
000022 Loss of Reactor Coolant Makeup / 2				44			AA1.08 VCT level	3.4	1
000025 Loss of RHR System / 4	45						AK1.01 Loss of RHR during all modes	3.9	1
000029 Anticipated Transient w/o Scram / 1									
000032 Loss of Source Range NI / 7		46					AK2.01 Switch positions	2.7	1
000033 Loss of Intermediate Range NI / 7	47						AK1.01 Effects of voltage changes	2.7	1
*00037 Steam Generator Tube Leak / 3						48	2.2.25 Tech. Spec. reason	2.5	1
000038 Steam Generator Tube Rupture / 3			49				EK3.06 Bases for actions of EOPs	4.2	1
000054 (CE/E06) Loss of Main Feedwater / 4									
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	50						EK1.2 Loss of heat sink EOP actions	3.9	1
000058 Loss of DC Power / 6					5		AA2.01 Determine substitute power source	3.7	1
000059 Accidental Liquid RadWaste Rel. / 9		33					AK2.01 radioactive liquid monitors	2.7	1
000060 Accidental Gaseous Radwaste Rel. / 9									
*00061 ARM System Alarms / 7			51				AK3.02 Guidance in alarm response	3.4	1
W/E16 High Containment Radiation / 9			52				EK3.1 Reasons for operating characteristics	2.9	1
CE/E09 Functional Recovery									
K/A Category Point Totals:	3	3	4	4	2	1	Group Point Total:		17





PWR RO Examination Outline Plant Systems - Tier 2/Group 1												Form ES-401-4		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive			8				98					K3.02/A1.01 RCS relationship/Predict Tave response	3.4/3.8	2
003 Reactor Coolant Pump			54					55				K3.01/A2.02 RCS / Abnormal shutdown of RCP	3.7/3.7	2
004 Chemical and Volume Control						56		57				K6.07/A2.18 HX & Cond / High VCT level	2.7/3.1	2
013 Engineered Safety Features Actuation				58			9					K4.13/A1.02 MFW Isol. / CNMT press. & temp.	3.7/3.9	2
015 Nuclear Instrumentation	59								10			K1.01/A3.02 RPS / Annunciator	4.1/3.7	2
017 In-core Temperature Monitor					60							K5.02 Saturation & subcooling	3.7	1
022 Containment Cooling							61					A1.01 Monitor CNMT temp.	3.6	1
025 Ice Condenser														
056 Condensate								62				A2.04 Loss of condensate pumps	2.6	1
059 Main Feedwater				63						64		K4.08/A4.12 Mismatch S/F signal/Initiation of FWI	2.5/3.4	2
061 Auxiliary/Emergency Feedwater	65							66				K1.01/A2.04 SG system / Pump failure	4.1/3.4	2
068 Liquid Radwaste	67										11	K1.07/2.3.11 Sources of input/Control releases	2.7/2.7	2
*071 Waste Gas Disposal				68					12			K4.01/A3.02 Decay Tank / Press. regulator	2.6/2.8	2
*072 Area Radiation Monitoring				69			13					K4.01/A1.01 Cont. isol. / Rad. levels	3.3/3.4	2
K/A Category Point Totals:	3	0	2	4	1	1	4	4	2	1	1	Group Point Total:		23

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 2											Form ES-401-4		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
*002 Reactor Coolant				70		14						K4.02/K6.03 Monitor level / Loss of level	3.5/3.1	2
006 Emergency Core Cooling					74					71		K5.02/A4.08 Accum. press. & level/Operate ESF Systems	2.8/4.0	2
010 Pressurizer Pressure Control			16							72		K3.01/A4.01 Loss of PCS on RCS / Monitor spray valves	3.8/3.7	2
011 Pressurizer Level Control	73											K1.03 PZR PCS	3.7	1
012 Reactor Protection														
*014 Rod Position Indication										17		A4.01 Rod selection control	3.3	1
016 Non-nuclear Instrumentation								15				A2.02 Loss of power supply	2.9	1
026 Containment Spray	18											K1.02 CSS and cooling water	4.1	1
029 Containment Purge														
*033 Spent Fuel Pool Cooling								75				A2.02 Loss of SFPCS	2.7	1
035 Steam Generator			76									K3.03 Effect on secondary systems	3.0	1
039 Main and Reheat Steam				77								K4.02 Use of Tave	3.1	1
055 Condenser Air Removal										78		A3.03 Automatic diversion to containment	2.5	1
062 AC Electrical Distribution								79				A2.05 Re-energize dead bus	2.9	1
063 DC Electrical Distribution	19											K1.03 125VDC connection	2.9	1
064 Emergency Diesel Generator		20								21		K2.02/A3.01 Fuel oil pump / Autostart of EDG	2.8/4.1	2
073 Process Radiation Monitoring											80	A4.02 Rad. monitor control panel	3.7	1
075 Circulating Water											81	2.1.32 Explain system P&Ls	3.4	1
079 Station Air														
086 Fire Protection														
K/A Category Point Totals:	3	1	2	2	1	1	0	3	2	4	1	Group Point Total:		20

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 3											Form ES-401-4		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
*005 Residual Heat Removal		22						82				K2.03/A2.02 Power supply/ Pressure protection in CSD	2.7/3.5	2
007 Pressurizer Relief/Quench Tank								23		24		A2.05/A4.10 PRT high pressure limits/Recognize leaking PORV	3.2/3.6	2
008 Component Cooling Water			83									K3.03 Loss of CCWS on RCP	4.1	1
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control														
034 Fuel Handling Equipment														
041 Steam Dump/Turbine Bypass Control										25		A4.08 Monitor SDS control of Tave	3.0	1
045 Main Turbine Generator	84											K1.20 Protective system	3.4	1
*076 Service Water									85			A3.02 Emergency heat loads	3.7	1
*078 Instrument Air														
103 Containment														
K/A Category Point Totals:	1	1	1	0	0	0	0	2	1	2	0	Group Point Total:		8
Plant-Specific Priorities														
System / Topic		Recommended Replacement for...					Reason					Points		
Plant-Specific Priority Total: (limit 10)														

Facility: FENOC BVPS UNIT 1		Date of Exam: 8/06/01		Exam Level: RO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.1 86	Knowledge of conduct of operations requirements	3.7	1	
	2.1.22 87	Ability to determine mode of operation	2.8	1	
	2.1.23 88	Ability to perform plant procedures, all modes	3.9	1	
	2.1.27 89	Knowledge of system purpose/function	2.8	1	
	Total				4
Equipment Control	2.2.12 90	Knowledge of surveillance procedures	3.0	1	
	2.2.13 91	Knowledge of tagging and clearance procedures	3.6	1	
	2.2.26 92	Knowledge of refueling administrative requirements	2.5	1	
	2.2.33 93	Knowledge of control rod programming	2.5	1	
	Total				4
Radiation Control	2.3.1 94	Knowledge of 10 CFR20 related radiation controls	2.6	1	
	2.3.2 95	Knowledge of ALARA	2.5	1	
	Total				2
Emergency Procedures/ Plan	2.4.6 97	Knowledge of symptom based EOP strategy	3.1	1	
	2.4.16 96	Knowledge of EOP hierarchy	3.0	1	
	2.4.10 100	Knowledge of alarm response procedures	3.0	1	
	Total				3
Tier 3 Point Total (RO)				13	

Facility: FENOC BVPS Unit 1		Date of Exam: 8/06/01						Exam Level: SRO						
Tier	Group	K/A Category Points											Point Total	
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *		
1. Emergency & Abnormal Plant Evolutions	1	3	3	6				5	6			1	24	
	2	5	1	5				3	1			1	16	
	3	1	1	0				0	1			0	3	
	Tier Totals	9	5	11				8	8			2	43	
2. Plant Systems	1	4	0	1	4	1	1	2	4	0	1	1	19	
	2	1	2	1	2	1	1	0	4	2	2	1	17	
	3	1	0	1	0	0	0	0	1	1	0	0	4	
	Tier Totals	6	2	3	6	2	2	2	9	3	3	2	40	
3. Generic Knowledge and Abilities						Cat 1		Cat 2		Cat 3		Cat 4		17
						6		5		3		3		
<p>Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p>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 <math>\pm 1</math> from that specified in the table based on NRC revisions. The final exam must total 100 points.</p> <p>3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>6.* The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p>														

ES-401		PWR SRO Examination Outline						Form ES-401-3	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1									
000003 Dropped Control Rod / 1	1						AK1.10 Definition of QPTR	2.9	1
000005 Inoperable/Stuck Control Rod / 1			2				AK3.04 Tech. Spec. limits	4.1	1
000011 Large Break LOCA / 3		41		3			EK2.02/EA1.03 Interrelation between LOCA and Pumps/Securing RCPs	2.7/4.0	2
W/E04 LOCA Outside Containment / 3				42	4		EA1.1/EA2.1 Components and functions/Select Procedure	4.0/4.3	2
W/E01 & E02 Rediagnosis & SI Termination / 3		71					EK2.2 SI Termination sequence	3.9	1
000015/17 RCP Malfunctions / 4					5		AA2.08 Bearing High Temperature	3.5	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4					6		EA2.2 Adherence to appropriate procedures	3.8	1
000024 Emergency Boration / 1	7						AK1.03 Boron calculation	2.9	1
000026 Loss of Component Cooling Water / 8					26		AA2.02 Determine cause of possible CCW loss	3.6	1
000029 Anticipated Transient w/o Scram / 1									
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4				28			AA1.04 Isolation of main steam lines	4.3	1
CE/A11; W/E08 RCS Overcooling - PTS / 4									
*000051 Loss of Condenser Vacuum / 4			29				AK3.01 Steam dump vacuum	3.1	1
000055 Station Blackout / 6			30		31		EK3.02/EA2.03 Actions for loss of power / Actions to restore power	4.6/4.7	2
*000057 Loss of Vital AC Elec. Inst. Bus / 6			32				AK3.01 Actions for loss of instrument bus	4.4	1
000059 Accidental Liquid RadWaste Rel. / 9		33					AK2.01 Radioactive gas monitors	2.8	1
*000062 Loss of Nuclear Service Water / 4			34				AK3.03 Actions for loss of service water	4.2	1
000067 Plant Fire On-site / 9	35						AK1.02 Fire fighting	3.9	1
000068 (BW/A06) Control Room Evac. / 8			36				AK3.18 Actions for control room evacuation	4.5	1
000069 (W/E14) Loss of CTMT Integrity / 5				37			AA1.01 Monitor isolation valves	3.7	1
000074 (W/E06&E07) Inad. Core Cooling / 4				38	8		EA1.06/EA2.02 Operate RCPs / AFW system	3.9/4.6	2
BW/E03 Inadequate Subcooling Margin / 4									
*000076 High Reactor Coolant Activity / 9						9	2.1.12 Ability to apply Tech. Specs.	4.0	1
BW/A02&A03 Loss of NNI-X/Y / 7									
K/A Category Totals:	3	3	6	5	6	1	Group Point Total:		24

ES-401		PWR SRO Examination Outline						Form ES-401-3	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2									
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									
BW/A01 Plant Runback / 1									
BW/A04 Turbine Trip / 4									
000008 Pressurizer Vapor Space Accident / 3			39				AK3.02 PORV/Code Safety Exit Temp	4.1	1
000009 Small Break LOCA / 3				40			EA1.01 Monitor RCS press. / temp.	4.3	1
BW/E08; W/E03 LOCA Cooldown - Depress. / 4									
W/E11 Loss of Emergency Coolant Recirc. / 4					43		EA2.2 Adherence to procedures	4.2	1
000022 Loss of Reactor Coolant Makeup / 2				44			AA1.08 VCT level	3.3	1
000025 Loss of RHR System / 4	45						AK1.01 Loss of RHR during all modes	4.3	1
000027 Pressurizer Pressure Control System Malfunction / 3	27						AK1.02 Expansion of liquid	3.1	1
000032 Loss of Source Range NI / 7		46					AK2.01 Switch positions	3.1	1
000033 Loss of Intermediate Range NI / 7	47						AK1.01 Effects of voltage changes	3.0	1
000037 Steam Generator Tube Leak / 3						48	2.2.25 Tech. Spec. reason	3.7	1
000038 Steam Generator Tube Rupture / 3			49				EK3.06 Bases for actions in EOP's	4.5	1
000054 (CE/E06) Loss of Main Feedwater / 4	10						AK1.01 Main feed line break	4.3	1
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	50			11			EK1.2/EA1.2 Loss of Heat Sink EOP's / Operating characteristics	4.5/4.0	2
000058 Loss of DC Power / 6									
000060 Accidental Gaseous Radwaste Rel. / 9									
000061 ARM System Alarms / 7			51				AK3.02 Guidance in alarm response	3.6	1
W/E16 High Containment Radiation / 9			52				EK3.1 Reasons for operating characteristics	3.1	1
000065 Loss of Instrument Air / 8			12				AK3.03 Effects of isolating equipment	3.4	1
CE/E09 Functional Recovery									
K/A Category Point Totals:	5	1	5	3	1	1	Group Point Total:		16

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ES-401	PWR SRO Examination Outline							Form ES-401-3		
Emergency and Abnormal Plant Evolutions - Tier 1/Group 3										
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points	
000028 Pressurizer Level Malfunction / 2		13					AK2.03 Controllers and positioners	2.9	1	
000036 (BW/A08) Fuel Handling Accident / 8										
000056 Loss of Off-site Power / 6					14		AA2.18 Operate and monitor PZR pressure	4.0	1	
BW/E13&E14 EOP Rules and Enclosures										
BW/A05 Emergency Diesel Actuation / 6										
BW/A07 Flooding / 8										
CE/A16 Excess RCS Leakage / 2										
W/E13 Steam Generator Over-pressure / 4	53						EK1.2 Normal Abnormal & EOP's	3.3	1	
W/E15 Containment Flooding / 5										
K/A Category Point Totals:	1	1	0	0	1	0	Group Point Total:		3	

ES-401	PWR SRO Examination Outline											Form ES-401-3		
Plant Systems - Tier 2/Group 1														
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive	16						98					K1.03/A1.01 Physical connection to CRDM/Predict Tave response	3.6/4.2	2
003 Reactor Coolant Pump			54					55				K3.01/A2.02 RCS / Abnormal shutdown of RCP	4.0/3.9	2
004 Chemical and Volume Control						56		57				K6.07/A2.18 HX & Cond. / High VCT level	2.8/3.1	2
013 Engineered Safety Features Actuation				58								K4.13 MFW Isolation/reset	3.9	1
014 Rod Position Indication														
015 Nuclear Instrumentation	59											K1.01 RPS	4.2	1
017 In-core Temperature Monitor					60							K5.02 Saturation & subcooling	4.0	1
022 Containment Cooling							61				15	A1.01/2.2.22 Monitor CNMT Temp/Knowledge of LCO's	3.7/4.1	2
025 Ice Condenser														
026 Containment Spray														
056 Condensate								62				A2.04 Loss of condensate pumps	2.8	1
059 Main Feedwater				63						64		K4.08/A4.12 Mismatch S/F signal / Initiation of FWI	2.7/3.5	2
061 Auxiliary/Emergency Feedwater	65							66				K1.01/A2.04 S/G system / Pump failure	4.1/3.8	2
063 DC Electrical Distribution														
068 Liquid Radwaste	67											K1.07 Sources of input	2.9	1
*071 Waste Gas Disposal				68								K4.01 Decay tank pressure	3.0	1
*072 Area Radiation Monitoring				69								K4.01 Containment isolation	3.6	1
K/A Category Point Totals:	4	0	1	4	1	1	2	4	0	1	1	Group Point Total:		19

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ES-401	PWR SRO Examination Outline											Form ES-401-3		
Plant Systems - Tier 2/Group 2														
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
*002 Reactor Coolant				70								K4.02 Monitor vessel level	3.8	1
006 Emergency Core Cooling					74			17				K5.02/A2.02 Accum. Press. and Level/Loss of flowpath	2.9/4.3	2
010 Pressurizer Pressure Control		99									72	K2.01/A4.01 PZR Heater power supply/Monitor spray valves	3.4/3.5	2
011 Pressurizer Level Control	73											K1.03 PZR/PCS	4.0	1
012 Reactor Protection		100							18			K2.01/A3.06 RPS power supply/Trip Logic	3.7/3.7	2
016 Non-nuclear Instrumentation														
*027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control						19						K6.01 Loss of H <sub>2</sub> recombiner	3.1	1
029 Containment Purge														
*033 Spent Fuel Pool Cooling								75				A2.02 Loss of SFPCS	3.0	1
034 Fuel Handling Equipment														
035 Steam Generator			76									K3.03 Effect on secondary systems	3.1	1
039 Main and Reheat Steam				77								K4.02 Use of Tave	3.2	1
055 Condenser Air Removal									78			A3.03 Automatic diversion to containment	2.7	1
062 AC Electrical Distribution								79				A2.05 Re-energize dead bus	3.3	1
064 Emergency Diesel Generator								20				A2.05 Malfunction loading EDG	3.2	1
073 Process Radiation Monitoring										80		A4.02 Rad. monitor control panel	3.7	1
075 Circulating Water											81	2.1.32 Explain system P&L's	3.8	1
079 Station Air														
086 Fire Protection														
103 Containment														
K/A Category Point Totals:	1	2	1	2	1	1	0	4	2	2	1	Group Point Total:		17

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ES-401	PWR SRO Examination Outline											Form ES-401-3		
Plant Systems - Tier 2/Group 3														
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
*005 Residual Heat Removal								82				A2.02 Pressure protection in CSD	3.7	1
007 Pressurizer Relief/Quench Tank														
008 Component Cooling Water			83									K3.03 Loss of CCWS on RCP	4.2	1
041 Steam Dump/Turbine Bypass Control														
045 Main Turbine Generator	84											K1.20 Protective system	3.6	1
*076 Service Water									85			A3.02 Emergency heat loads	3.7	1
078 Instrument Air														
K/A Category Point Totals:	1	0	1	0	0	0	0	1	1	0	0	Group Point Total:		4
Plant-Specific Priorities														
System / Topic	Recommended Replacement for...											Reason	Points	
Plant-Specific Priority Total: (limit 10)														

Facility: FENOC BVPS UNIT 1		Date of Exam: 8/06/01		Exam Level: SRO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.1 86	Knowledge of conduct of operations requirements	3.8	1	
	2.1.7 21	Ability to make operational judgment based on plant behavior and instruments	4.4	1	
	2.1.12 22	Apply Technical Specifications to a system	4.0	1	
	2.1.22 87	Ability to determine mode of operation	3.3	1	
	2.1.23 88	Ability to perform plant procedures, all modes	4.0	1	
	2.1.27 89	Knowledge of system purpose/function	2.9	1	
	Total				6
Equipment Control	2.2.12 90	Knowledge of surveillance procedures	3.4	1	
	2.2.13 91	Knowledge of tagging and clearance procedures	3.8	1	
	2.2.22 23	Knowledge of LCO's and safety limits	4.1	1	
	2.2.26 92	Knowledge of refueling administrative requirements	3.7	1	
	2.2.33 93	Knowledge of control rod programming	2.9	1	
	Total				5
Radiation Control	2.3.1 94	Knowledge of 10CFR20 related radiation control	3.0	1	
	2.3.2 95	Knowledge of ALARA	2.9	1	
	2.3.4 24	Knowledge of limits, cont. control and extensions	3.1	1	
	Total				3
Emergency Procedures/ Plan	2.4.6 97	Knowledge of symptom based EOP	4.0	1	
	2.4.7 25	EOP mitigation strategy	3.8	1	
	2.4.16 96	Knowledge of EOP hierarchy	4.0	1	
	Total				3
Tier 3 Point Total (SRO)					17