

Facility: FitzPatrick		Date of Exam: November 2001						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	6	5				5	5			2	26
	2	2	3	3				3	4			2	17
	Tier Totals	5	9	8				8	9			4	43
2. Plant Systems	1	1	2	2	2	2	2	3	3	3	2	1	23
	2	1	1	1	0	1	1	0	2	2	2	2	13
	3	0	0	0	0	0	1	1	1	0	0	1	4
	Tier Totals	2	3	3	2	3	4	4	6	5	4	4	40
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		17
					3		5		4		5		
<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 by ± 1 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 SRO 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

BWR SRO Examination Outline
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

Form ES-401-1 (R8, S1)

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
295003 Partial or Complete Loss of AC Pwr / 6				X			Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER: (CFR: 41.7 / 45.6) AA1.03 Systems necessary to assure safe plant shutdown 4.4*/ 4.4*	4.4	1
295006 SCRAM / 1					X		Ability to determine and/or interpret the following as they apply to SCRAM: (CFR: 41.10 / 43.5 / 45.13) AA2.02 Control rod position 4.3*/ 4.4*	4.4	1
295007 High Reactor Pressure / 3						X	2.3.4 Knowledge of radiation exposure limits and contamination control / including permissible levels in excess of those authorized. (CFR: 43.4 / 45.10) RO 2.5 / SRO 3.1	3.1	1
295009 Low Reactor Water Level / 2					X		AA2. Ability to determine and/or interpret the following as they apply to LOW REACTOR WATER LEVEL: (CFR: 41.10 / 43.5 / 45.13) AA2.03 Reactor water cleanup blowdown rate 2.9 / 2.9	2.9	1
295010 High Drywell Pressure / 5				X			AA1. Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: (CFR: 41.7 / 45.6) AA1.01 Drywell ventilation/cooling 3.4 / 3.5	3.5	1
295013 High Suppression Pool Temp. / 5			S				AK3. Knowledge of the reasons for the following responses as they apply to HIGH SUPPRESSION POOL TEMPERATURE: (CFR: 41.5 / 45.6) AK3.02 Limiting heat additions 3.6 / 3.8	3.8	1
295014 Inadvertent Reactivity Addition / 1		S					AK2. Knowledge of the interrelations between INADVERTENT REACTIVITY ADDITION and the following: (CFR: 41.7 / 45.8) AK2.11 Recirculation flow control 3.6 / 3.7	3.7	1
295015 Incomplete SCRAM / 1	X						AK1. Knowledge of the operational implications of the following concepts as they apply to INCOMPLETE SCRAM: (CFR: 41.8 to 41.10) AK1.01 Shutdown margin 3.6* / 3.9*	3.9	1
295016 Control Room Abandonment / 7		S					AK2. Knowledge of the interrelations between CONTROL ROOM ABANDONMENT and the following: (CFR: 41.7 / 45.8) AK2.01 Remote shutdown panel: Plant-Specific 4.4* / 4.5*	4.5	1
295017 High Off-site Release Rate / 9			X				AK3. Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE: (CFR: 41.5 / 45.6) AK3.02 Plant ventilation 3.3 / 3.5	3.5	1
295023 Refueling Accidents Cooling Mode / 8				X			AA1. Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS: (CFR: 41.7 / 45.6) AA1.02 Fuel pool cooling and cleanup system 2.9 / 3.1	3.1	1
295024 High Drywell Pressure / 5					X		EA2. Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE: (CFR: 41.10 / 43.5 / 45.13) EA2.01 Drywell pressure 4.2*/ 4.4*	4.4	1
295025 High Reactor Pressure / 3						S	2.2.22 Knowledge of limiting conditions for operations and safety limits. (CFR: 43.2 / 45.2) RO 3.4/SRO 4.1	4.1	1
295026 Suppression Pool High Water Temp. / 5					X		EA2. Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: (CFR: 41.10 / 43.5 / 45.13) EA2.01 Suppression pool water temperature 4.1* / 4.2*	4.2	1

AL

SCRAM

RAD

RPV L

D/W P

SPT

P

SCRAM

RSP

RAD

Refuel

D/W P₂

SL/LLO

SPT₂

2	295031 Reactor Low Water Level / 2				X			EA1. Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL: (CFR: 41.7 / 45.6) EA1.06 Automatic depressurization system 4.4* / 4.4*	4.4	1
1	295030 Low Suppression Pool Water Level / 5			X				EK3. Knowledge of the reasons for the following responses as they apply to LOW SUPPRESSION POOL WATER LEVEL: (CFR: 41.5 / 45.6) EK3.03 RCIC operation: Plant-Specific 3.6 / 3.7	3.7	1
3	295031 Reactor Low Water Level / 2		X					EK2. Knowledge of the interrelations between REACTOR LOW WATER LEVEL and the following: (CFR: 41.7 / 45.8) EK2.04 Reactor core isolation cooling: Plant-Specific. 4.0 / 4.1	4.1	1
3	295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1	X						EK1. Knowledge of the operational implications of the following concepts as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: (CFR: 41.8 to 41.10) EK1.03 Boron effects on reactor power (SBLC) 4.2 / 4.4*	4.4	1
2	295038 High Off-site Release Rate / 9		X					EK2. Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following: (CFR: 41.7 / 45.8) EK2.05 †Site emergency plan 3.7 / 4.7*	4.7	1
1	500000 High Containment Hydrogen Conc. / 5			X				EK3. Knowledge of the reasons for the following responses as they apply to HIGH PRIMARY CONTAINMENT HYDROGEN CONCENTRATIONS: (CFR: 41.5 / 45.6) EK3.07 Operation of drywell vent 3.1/ 3.7	3.7	1
3	295013 High Suppression Pool Temp. / 5					X		AA2. Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL TEMPERATURE: (CFR: 41.10 / 43.5 / 45.13) AA2.02 Localized heating/stratification 3.2 / 3.5	3.5	1
3	295014 Inadvertent Reactivity Addition / 1				X			AA1. Ability to operate and/or monitor the following as they apply to INADVERTENT REACTIVITY ADDITION: (CFR: 41.7 / 45.6) AA1.01 RPS 4.0/4.1*	4.1	1
2	295016 Control Room Abandonment / 7			X				AK3. Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT: (CFR: 41.5 / 45.6) AK3.03 Disabling control room controls 3.5 / 3.7*	3.7	1
R/L	295023 Refueling Accidents Cooling Mode / 8		S					AK2. Knowledge of the interrelations between REFUELING ACCIDENTS and the following: (CFR: 41.7 / 45.8) AK2.07 Standby gas treatment/FRVS 3.6 / 3.9	3.9	1
R/P	295025 High Reactor Pressure / 3	X						EK1. Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR PRESSURE: (CFR: 41.8 to 41.10) EK1.04 Decay heat generation 3.6 / 3.9	3.9	1
P	295014 Inadvertent Reactivity Addition / 1		S					AK2. Knowledge of the interrelations between INADVERTENT REACTIVITY ADDITION and the following: (CFR: 41.7 / 45.8) AK2.08 RMCS: 3.4/3.5	3.5	1
K/A Category Totals:		3	6	5	5	5	2	Group Point Total: (26 required)	26	

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4	S 7						AK1. Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: (CFR: 41.8 to 41.10) AK1.01 Natural circulation 3.5 / 3.6	3.6	1
295002 Loss of Main Condenser Vacuum / 3		X					AK2. Knowledge of the interrelations between LOSS OF MAIN CONDENSER VACUUM and the following: (CFR: 41.7 / 45.8) AK2.07 Offgas system 3.1 / 3.1	3.1	1
295004 Partial or Total Loss of DC Pwr / 6			X				AK3. Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: (CFR: 41.5 / 45.6) AK3.02 Ground isolation/fault determination 2.9 / 3.3	3.3	1
295008 High Reactor Water Level / 2				X			AA1. Ability to operate and/or monitor the following as they apply to HIGH REACTOR WATER LEVEL: (CFR: 41.7 / 45.6) AA1.01 Reactor water level control: Plant-Specific 3.7 / 3.7	3.7	1
295018 Partial or Total Loss of CCW / 8					X		AA2. Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: (CFR: 41.10 / 43.5 / 45.13) AA2.01 Component temperatures 3.3 / 3.4	3.4	1
295019 Partial or Total Loss of Inst. Air / 8						X	2.3.7 Knowledge of the process for preparing a radiation work permit. RO 2.0 / SRO 3.3	3.3	1
295020 Inadvertent Cont. Isolation / 5 & 7					X		AA2. Ability to determine and/or interpret the following as they apply to INADVERTENT CONTAINMENT ISOLATION: (CFR: 41.10 / 43.5 / 45.13) AA2.01 Drywell/containment pressure 3.6 / 3.7	3.7	1
295021 Loss of Shutdown Cooling / 4				X			AA1. Ability to operate and/or monitor the following as they apply to LOSS OF SHUTDOWN COOLING: (CFR: 41.7 / 45.6) AA1.02 RHR/shutdown cooling 3.5 / 3.5	3.5	1
295022 Loss of CRD Pumps / 1			X				AK3. Knowledge of the reasons for the following responses as they apply to LOSS OF CRD PUMPS: (CFR: 41.5 / 45.6) AK3.02 CRDM high temperature 2.9 / 3.1	3.1	1
295028 High Drywell Temperature / 5		X					EK2. Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: (CFR: 41.7 / 45.8) EK2.02 Components internal to the drywell 3.2 / 3.3	3.3	1
295029 High Suppression Pool Water Level / 5	X						EK1. Knowledge of the operational implications of the following concepts as they apply to HIGH SUPPRESSION POOL WATER LEVEL: (CFR: 41.8 to 41.10) EK1.01 Containment integrity 3.4 / 3.7	3.7	1
295032 High Secondary Containment Area Temperature / 5		S 8					EK2. Knowledge of the interrelations between HIGH SECONDARY CONTAINMENT AREA TEMPERATURE and the following: (CFR: 41.7 / 45.8) EK2.01 Area/room coolers 3.5 / 3.6	3.6	1
295033 High Secondary Containment Area Radiation Levels / 9			S 9				EK3. Knowledge of the reasons for the following responses as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS: (CFR: 41.5 / 45.6) EK3.05 Emergency plan 3.6 / 4.5*	4.5	1

295034 Secondary Containment Ventilation High Radiation / 9				X			EA1. Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION: (CFR: 41.7 / 45.6) EA1.01 Area radiation monitoring system 3.8 / 3.8	3.8	1
295035 Secondary Containment High Differential Pressure / 5					X		EA2. Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: (CFR: 41.8 to 41.10) EA2.01 Secondary containment pressure: 3.8 / 3.9	3.9	1
295036 Secondary Containment High Sump/Area Water Level / 5						X	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics / reactor behavior / and instrument interpretation - RO 3.7/SRO 4.4	4.4	1
600000 Plant Fire On Site / 8					X		AA2 Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: AA2.12 Location of vital equipment within fire zone 3.1 / 3.5	3.5	1
K/A Category Point Totals:	2	3	3	3	4	2	Group Point Total:		17

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
261000 SGTS									S 10			A3. Ability to monitor automatic operations of the STANDBY GAS TREATMENT SYSTEM including: (CFR: 41.7 / 45.7) A3.01 System flow 3.2 / 3.3	3.3	1
202002 Recirculation Flow Control								S 11				A2. Ability to (a) predict the impacts of the following on the RECIRCULATION FLOW CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.09 Recirculation flow mismatch: Plant-Specific 3.1 / 3.3	3.3	1
203000 RHR/LPCI: Injection Mode							X					A1. Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) controls including: (CFR: 41.5 / 45.5) A1.04 System pressure 3.6 / 3.6	3.6	1
206000 HPCI						X						K6. Knowledge of the effect that a loss or malfunction of the following will have on the HIGH PRESSURE COOLANT INJECTION SYSTEM : (CFR: 41.7 / 45.7) K6.03 A.C. power: BWR-2,3,4 - 2.9 / 3.1*	3.1	1
202002 Recirculation Flow Control					X							K5. Knowledge of the operational implications of the following concepts as they apply to RECIRCULATION FLOW CONTROL SYSTEM : (CFR: 41.5 / 45.3) K5.01 Fluid coupling: BWR-3,4 - 2.8/2.8	2.8	1
209001 LPCS				X								K4. Knowledge of LOW PRESSURE CORE SPRAY SYSTEM design feature(s) and/or interlocks which provide for the following: K4.01 Prevention of overpressurization of core spray piping 3.2 / 3.4	3.4	1
217000 RCIC			X									K3. Knowledge of the effect that a loss or malfunction of the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) will have on following: (CFR: 41.7 / 45.4) K3.02 Reactor vessel pressure 3.6 / 3.6	3.6	1
211000 SLC		X										K2. Knowledge of electrical power supplies to the following (CFR: 41.7) K2.01 SBLC pumps 2.9* / 3.1*	3.1	1
212000 RPS	X											K1. Knowledge of the physical connections and/or cause- effect relationships between REACTOR PROTECTION SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.15 SCRAM air header pressure 3.8/3.9	3.9	1
215004 Source Range Monitor		S 12										K2. Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.01 SRM channels/detectors 2.6/2.8	2.8	1

215005 APRM / LPRM			X												K3. Knowledge of the effect that a loss or malfunction of the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM will have on following: (CFR: 41.7 / 45.4) K3.07 Rod block monitor 3.2/3.3	3.3	1
216000 Nuclear Boiler Instrumentation				X											K4. Knowledge of NUCLEAR BOILER INSTRUMENTATION design feature(s) and/or interlocks which provide for the following: (CFR: 41.7) K4.14 Temperature compensation for reactor water level indication: 3.3/ 3.4	3.4	1
217000 RCIC					X										K5. Knowledge of the operational implications of the following concepts as they apply to REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) : (CFR: 41.5 / 45.3) K5.07 Assist core cooling 3.1 / 3.1	3.1	1
218000 ADS						X									K6. Knowledge of the effect that a loss or malfunction of the following will have on the AUTOMATIC DEPRESSURIZATION SYSTEM : (CFR: 41.7 / 45.7) K6.05 A.C. power: 3.0*/ 3.1*	3.1	1
223001 Primary CTMT and Auxiliaries							X								A1. Ability to predict and/or monitor changes in parameters associated with operating the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES controls including: (CFR: 41.5 / 45.5) A1.11 Reactor building to suppression chamber differential pressure: Plant-Specific 3.1/ 3.2	3.2	1
223002 PCIS/Nuclear Steam Supply Shutoff								X							A2. Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.06 Containment instrumentation failures 3.0/ 3.2	3.2	1
239002 SRVs									X						A3. Ability to monitor automatic operations of the RELIEF/SAFETY VALVES including: (CFR: 41.7 / 45.7) A3.03 Tail pipe temperatures 3.6/3.6	3.6	1
241000 Reactor/Turbine Pressure Regulator										X					A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.16 Lights and alarms 3.3/3.2	3.2	1
259002 Reactor Water Level Control											X				2.4.34 Knowledge of RO tasks performed outside the main control room during emergency operations including system geography and system implications. RO 3.8/ SRO 3.6	3.6	1

261000 SGTS										X		A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.01 †Off-site release levels: 3.2*/ 4.0*	4.0	1
262001 AC Electrical Distribution										X		A3. Ability to monitor automatic operations of the A.C. ELECTRICAL DISTRIBUTION including: (CFR: 41.7 / 45.7) A3.02 Automatic bus transfer 3.2/3.3	3.3	1
264000 EDGs										X		A2. Ability to (a) predict the impacts of the following on the EMERGENCY GENERATORS (DIESEL/JET) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.01 Parallel operation of emergency generator 3.5/3.6	3.6	1
290001 Secondary CTMT										X		A1. Ability to predict and/or monitor changes in parameters associated with operating the SECONDARY CONTAINMENT controls including: (CFR: 41.5 / 45.5) A1.01 System lineups 3.1/3.1	3.1	1
K/A Category Point Totals:	1	2	2	2	2	2	3	3	3	2	1	Group Point Total:		23

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
201001 CRD Hydraulic		X										K2. Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.05 Alternate rod insertion valve solenoids: 4.5*/4.5*	4.5	1
201002 RMCS			X									K3. Knowledge of the effect that a loss or malfunction of the REACTOR MANUAL CONTROL SYSTEM will have on following: (CFR: 41.7 / 45.4) K3.01 Ability to move control rods 3.4/3.4	3.4	1
201006 RWM	X											Changed from K4 to K1 to obtain required amount of K1 K1. Knowledge of the physical connections and/or cause-effect relationships between ROD BLOCK MONITOR SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.02 LPRM: 3.2 / 3.1	3.0	1
202001 Recirculation					X							K5. Knowledge of the operational implications of the following concepts as they apply to RECIRCULATION SYSTEM : (CFR: 41.5 / 45.3) K5.10 Motor generator set operation: Plant-Specific 2.8*/ 2.8	2.8	1
204000 RWCU						X						K6. Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR WATER CLEANUP SYSTEM : (CFR: 41.7 / 45.7) K6.05 A. C. power 2.6/2.6	2.6	1
214000 RPIS											X	*Note - No A1 Cat.-placed in G to obtain required number 2.2.24 Ability to analyze the affect of maintenance activities on LCO status. RO 2.6/SRO 3.8	3.8	1
215002 RBM								X				A2. Ability to (a) predict the impacts of the following on the ROD BLOCK MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.03 Loss of associated reference APRM channel: 3.1/3.3	3.3	1
245000 Main Turbine Gen. and Auxiliaries									X			A3. Ability to monitor automatic operations of the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS including: (CFR: 41.7 / 45.7) A3.06 Turbine lube oil pressure 2.5/2.6	2.6	1

262002 UPS (AC/DC)											X		A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.01 Transfer from alternative source to preferred source 2.8/3.1	3.1	1
263000 DC Electrical Distribution												X	2.4.10 Knowledge of annunciator response procedures. RO 3.0/ SRO 3.1	3.1	1
290003 Control Room HVAC												X	A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.04 Environmental conditions 2.8/ 3.0	3.0	1
300000 Instrument Air											X		A3. Ability to monitor automatic operations of the INSTRUMENT AIR SYSTEM including: (CFR: 41.7 / 45.7) A3.02 Air temperature 2.9/2.7	2.7	1
400000 Component Cooling Water									X				A2. Ability to (a) predict the impacts of the following on the CCWS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: (CFR: 41.5 / 45.6) A2.01 Loss of CCW pump 3.3/ 3.4	3.4	1
K/A Category Point Totals:	1	1	1	0	1	1	0	2	2	2	2	Group Point Total:			13

ES-401

BWR SRO Examination Outline
Plant Systems - Tier 2/Group 3

Form ES-401-1 (R8, S1)

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
215001 Traversing In-core Probe						X						K6. Knowledge of the effect that a loss or malfunction of the following will have on the TRAVERSING IN-CORE PROBE: (CFR: 41.7 / 45.7) K6.04 Primary containment isolation system: 3.1/3.4	3.4	1
233000 Fuel Pool Cooling and Cleanup							X					A1. Ability to predict and/or monitor changes in parameters associated with operating the FUEL POOL COOLING AND CLEAN-UP controls including: (CFR: 41.5 / 45.5) A1.03 Pool temperature 3.1/ 3.3	3.3	1
239001 Main and Reheat Steam								X				A2. Ability to (a) predict the impacts of the following on the MAIN AND REHEAT STEAM SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.07 Main steam area high temperature or differential temperature high 3.8/3.9	3.9	1
290002 Reactor Vessel Internals											S	*Note: no A3 - use G to obtain required number of genics 2.1.11 Knowledge of less than one hour technical specification action statements for systems. RO 3.0/SRO 3.8	3.8	1
K/A Category Point Totals:	0	0	0	0	0	1	1	1	0	0	1	Group Point Total:		4

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points

Plant-Specific Priority Total (limit 10):

Facility: Fitzpatrick		Date of Exam: November 2001		Exam Level:SRO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.6	Ability to supervise and assume a management role during plant transients and upset conditions. RO 2.1 / SRO 4.3	4.3 SRO		
	2.1.10	Knowledge of conditions and limitations in the facility license. RO 2.7 / SRO 3.9	3.9 SRO		
	2.1.34	Ability to maintain primary and secondary plant chemistry within allowable limits. RO 2.3 / SRO 2.9	2.9 SRO		
	Total			3	
Equipment Control	2.2.19	Knowledge of maintenance work order requirements. RO 2.1 / SRO 3.1	3.1 SRO		
	2.2.21	Knowledge of pre and post maintenance operability requirements. RO 2.3 / SRO 3.5	3.5 SRO		
	2.2.20	Knowledge of the process for managing troubleshooting activities. RO 2.2 / SRO 3.3	3.3 SRO		
	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. RO 2.5 / SRO 3.7	3.7 SRO		
	2.2.32	Knowledge of the effects of alterations on core configuration. RO 2.3 / SRO 3.3	3.3 SRO		
	Total			5	
Radiation Control					
	2.3.3	Knowledge of SRO responsibilities for auxiliary systems that are outside the control room (e.g. / waste disposal and handling systems). RO 1.8 / SRO 2.9	2.9 SRO		

	2.3.6	Knowledge of the requirements for reviewing and approving release permits. RO 2.1 / SRO 3.1	3.1 SRO	
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. RO 2.9 / SRO 3.3	3.3 SRO	
	2.3.11	Ability to control radiation releases. RO 2.7 / SRO 3.2	3.2	
	Total			4
Emergency Procedures/ Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps. RO 4.3 / SRO 4.6	4.6	
	2.4.18	Knowledge of the specific bases for EOPs. RO 2.7 / SRO 3.6	3.6	
	2.4.24	Knowledge of loss of cooling water procedures. RO 3.3 / SRO 3.7	3.7 SRO	
	2.4.32	Knowledge of operator response to loss of all annunciators. RO 3.3 / SRO 3.5	3.5	
	2.4.48	Ability to interpret control room indications to verify the status and operation of system / and understand how operator actions and directives affect plant and system conditions. RO 3.5 / SRO 3.8	3.8 SRO	
	Total			5
Tier 3 Point Total (RO/SRO)				17

Facility: Fitzpatrick		Date of Exam: November 2001						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	3	2	1				3	3			1	13
	2	2	3	6				3	5			0	19
	3	0	0	0				2	1			1	4
	Tier Totals	5	5	7				8	9			2	36
2. Plant Systems	1	2	3	3	2	2	2	2	4	3	3	2	28
	2	2	1	1	1	1	2	1	2	4	2	2	19
	3	2	0	0	0	0	1	1	0	0	0	0	4
	Tier Totals	6	4	4	3	3	5	4	6	7	5	4	51
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		13
					3		3		3		4		
<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 by ±1 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 SRO 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>													

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BWR RO Examination Outline
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

Form ES-401-2 (R8, S1)

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
295005 Main Turbine Generator Trip / 3									
295006 SCRAM / 1					X		Ability to determine and/or interpret the following as they apply to SCRAM: (CFR: 41.10 / 43.5 / 45.13) AA2.02 Control rod position 4.3* / 4.4*	4.3	1
295007 High Reactor Pressure / 3						X	2.3.4 Knowledge of radiation exposure limits and contamination control / including permissible levels in excess of those authorized. (CFR: 43.4 / 45.10) RO 2.5 / SRO 3.1	2.5	1
295009 Low Reactor Water Level / 2					X		AA2. Ability to determine and/or interpret the following as they apply to LOW REACTOR WATER LEVEL: (CFR: 41.10 / 43.5 / 45.13) AA2.03 Reactor water cleanup blowdown rate 2.9 / 2.9	2.9	1
295010 High Drywell Pressure / 5				X			AA1. Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: (CFR: 41.7 / 45.6) AA1.01 Drywell ventilation/cooling 3.4 / 3.5	3.4	1
295014 Inadvertent Reactivity Addition / 1		R					AK2. Knowledge of the interrelations between INADVERTENT REACTIVITY ADDITION and the following: (CFR: 41.7 / 45.8) AK2.11 Recirculation flow control 3.6 / 3.7	3.6	1
295014 Inadvertent Reactivity Addition / 1				X			AA1. Ability to operate and/or monitor the following as they apply to INADVERTENT REACTIVITY ADDITION: (CFR: 41.7 / 45.6) AA1.01 RPS 4.0/4.1*	4.0	1
295015 Incomplete SCRAM / 1	X						AK1. Knowledge of the operational implications of the following concepts as they apply to INCOMPLETE SCRAM: (CFR: 41.8 to 41.10) AK1.01 Shutdown margin 3.6* / 3.9*	3.6	1
295024 High Drywell Pressure / 5					X		EA2. Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE: (CFR: 41.10 / 43.5 / 45.13) EA2.01 Drywell pressure 4.2* / 4.4*	4.2	1
295025 High Reactor Pressure / 3	X						EK1. Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR PRESSURE: (CFR: 41.8 to 41.10) EK1.04 Decay heat generation 3.6 / 3.9	3.6	1
295031 Reactor Low Water Level / 2				X			EA1. Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL: (CFR: 41.7 / 45.6) EA1.06 Automatic depressurization system 4.4* / 4.4*	4.4	1
295031 Reactor Low Water Level / 2		X					EK2. Knowledge of the interrelations between REACTOR LOW WATER LEVEL and the following: (CFR: 41.7 / 45.8) EK2.04 Reactor core isolation cooling: Plant-Specific. 4.0 / 4.1	4.0	1
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1	X						EK1. Knowledge of the operational implications of the following concepts as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: (CFR: 41.8 to 41.10) EK1.03 Boron effects on reactor power (SBL) 4.2 / 4.4*	4.2	1

500000 High Containment Hydrogen Conc. / 5			X				EK3. Knowledge of the reasons for the following responses as they apply to HIGH PRIMARY CONTAINMENT HYDROGEN CONCENTRATIONS: (CFR: 41.5 / 45.6) EK3.07 Operation of drywell vent 3.1/ 3.7	3.1	1
K/A Category Totals:	3	2	1	3	3	1	Group Point Total:		13

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BWR RO Examination Outline
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

Form ES-401-2 (R8, S1)

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4	R						AK1. Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: (CFR: 41.8 to 41.10) AK1.01 Natural circulation 3.5 / 3.6	3.5	1
295002 Loss of Main Condenser Vacuum / 3		X					AK2. Knowledge of the interrelations between LOSS OF MAIN CONDENSER VACUUM and the following: (CFR: 41.7 / 45.8) AK2.07 Offgas system 3.1 / 3.1	3.1	1
295003 Partial or Complete Loss of AC Pwr / 6				X			Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER: (CFR: 41.7 / 45.6) AA1.03 Systems necessary to assure safe plant shutdown 4.4* / 4.4*	4.4	1
295004 Partial or Complete Loss of DC Pwr / 6			X				AK3. Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: (CFR: 41.5 / 45.6) AK3.02 Ground isolation/fault determination 2.9 / 3.3	2.9	1
295008 High Reactor Water Level / 2				X			AA1. Ability to operate and/or monitor the following as they apply to HIGH REACTOR WATER LEVEL: (CFR: 41.7 / 45.6) AA1.01 Reactor water level control: Plant-Specific 3.7 / 3.7	3.7	1
295011 High CTMT Temperature / 5									
295012 High Drywell Temperature / 5									
295013 High Suppression Pool Temp. / 5			R				AK3. Knowledge of the reasons for the following responses as they apply to HIGH SUPPRESSION POOL TEMPERATURE: (CFR: 41.5 / 45.6) AK3.02 Limiting heat additions 3.6 / 3.8	3.6	1
295013 High Suppression Pool Temp. / 5					X		AA2. Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL TEMPERATURE: (CFR: 41.10 / 43.5 / 45.13) AA2.02 Localized heating/stratification 3.2 / 3.5	3.2	1
295016 Control Room Abandonment / 7			X				AK3. Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT: (CFR: 41.5 / 45.6) AK3.03 Disabling control room controls 3.5 / 3.7*	3.5	1
295017 High Off-site Release Rate / 9			X				AK3. Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE: (CFR: 41.5 / 45.6) AK3.02 Plant ventilation 3.3 / 3.5	3.3	1
295018 Partial or Complete Loss of CCW / 8					X		AA2. Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: (CFR: 41.10 / 43.5 / 45.13) AA2.01 Component temperatures 3.3 / 3.4	3.3	1
295019 Part. or Comp. Loss of Inst. Air / 8									
295020 Inadvertent Cont. Isolation / 5 & 7					X		AA2. Ability to determine and/or interpret the following as they apply to INADVERTENT CONTAINMENT ISOLATION: (CFR: 41.10 / 43.5 / 45.13) AA2.01 Drywell/containment pressure 3.6 / 3.7	3.6	1
295022 Loss of CRD Pumps / 1			X				AK3. Knowledge of the reasons for the following responses as they apply to LOSS OF CRD PUMPS: (CFR: 41.5 / 45.6) AK3.02 CRDM high temperature 2.9 / 3.1	2.9	1

295026 High Suppression Pool Water Temp. / 5					X		EA2. Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: (CFR: 41.10 / 43.5 / 45.13) EA2.01 Suppression pool water temperature 4.1* / 4.2*	4.1	1
295027 High Containment Temperature / 5									
295028 High Drywell Temperature / 5		X					EK2. Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: (CFR: 41.7 / 45.8) EK2.02 Components internal to the drywell 3.2 / 3.3	3.2	1
295029 High Suppression Pool Water Level / 5	X						EK1. Knowledge of the operational implications of the following concepts as they apply to HIGH SUPPRESSION POOL WATER LEVEL: (CFR: 41.8 to 41.10) EK1.01 Containment integrity 3.4 / 3.7	3.4	1
295030 Low Suppression Pool Water Level / 5			X				EK3. Knowledge of the reasons for the following responses as they apply to LOW SUPPRESSION POOL WATER LEVEL: (CFR: 41.5 / 45.6) EK3.03 RCIC operation: Plant-Specific 3.6 / 3.7	3.6	1
295033 High Sec. Cont. Area Rad. Levels / 9									
295034 Sec. Cont. Ventilation High Rad. / 9					X		EA1. Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION: (CFR: 41.7 / 45.6) EA1.01 Area radiation monitoring system 3.8 / 3.8	3.8	1
295038 High Off-site Release Rate / 9		X					EK2. Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following: (CFR: 41.7 / 45.8) EK2.05 †Site emergency plan 3.7 / 4.7*	3.7	1
600000 Plant Fire On Site / 8					X		AA2 Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: AA2.12 Location of vital equipment within fire zone 3.1 / 3.5	3.1	1
K/A Category Point Totals:	2	3	6	3	5	0	Group Point Total:		19

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BWR RO Examination Outline
Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

Form ES-401-2 (R8, S1)

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
295021 Loss of Shutdown Cooling / 4				X			AA1. Ability to operate and/or monitor the following as they apply to LOSS OF SHUTDOWN COOLING: (CFR: 41.7 / 45.6) AA1.02 RHR/shutdown cooling 3.5 / 3.5	3.5	1
295023 Refueling Accidents / 8				X			AA1. Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS: (CFR: 41.7 / 45.6) AA1.02 Fuel pool cooling and cleanup system 2.9 / 3.1	2.9	1
295032 High Secondary Containment Area Temperature / 5									
295035 Secondary Containment High Differential Pressure / 5					X		EA2. Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: (CFR: 41.8 to 41.10) EA2.01 Secondary containment pressure: 3.8 / 3.9	3.8	1
295036 Secondary Containment High Sump/Area Water Level / 5						X	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics / reactor behavior / and instrument interpretation - RO 3.7/SRO 4.4	3.7	1
K/A Category Point Totals:	0	0	0	2	1	1	Group Point Total:		4

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
201001 CRD Hydraulic		X										K2. Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.05 Alternate rod insertion valve solenoids: 4.5/4.5*	4.5	1
201002 RMCS			X									K3. Knowledge of the effect that a loss or malfunction of the REACTOR MANUAL CONTROL SYSTEM will have on following: (CFR: 41.7 / 45.4) K3.01 Ability to move control rods 3.4/3.4	3.4	1
201005 RCIS (BWR-6)														
202002 Recirculation Flow Control								R				A2. Ability to (a) predict the impacts of the following on the RECIRCULATION FLOW CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.09 Recirculation flow mismatch: Plant-Specific 3.1 / 3.3	3.1	1
202002 Recirculation Flow Control					X							K5. Knowledge of the operational implications of the following concepts as they apply to RECIRCULATION FLOW CONTROL SYSTEM: (CFR: 41.5 / 45.3) K5.01 Fluid coupling: BWR-3,4 - 2.8/2.8	2.8	1
203000 RHR/LPCI: Injection Mode							X					A1. Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) controls including: (CFR: 41.5 / 45.5) A1.04 System pressure 3.6 / 3.6	3.6	1
206000 HPCI						X						K6. Knowledge of the effect that a loss or malfunction of the following will have on the HIGH PRESSURE COOLANT INJECTION SYSTEM: (CFR: 41.7 / 45.7) K6.03 A.C. power: BWR-2,3,4 - 2.9 / 3.1*	2.9	1
207000 Isolation (Emerg.) Condenser (NA)														
209001 LPCS				X								K4. Knowledge of LOW PRESSURE CORE SPRAY SYSTEM design feature(s) and/or interlocks which provide for the following: K4.01 Prevention of overpressurization of core spray piping 3.2 / 3.4	3.2	1
209002 HPCS (NA)														
211000 SLC		X										K2. Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.01 SBLC pumps 2.9* / 3.1*	2.9	1
212000 RPS	X											K1. Knowledge of the physical connections and/or cause-effect relationships between REACTOR PROTECTION SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.15 SCRAM air header pressure 3.8/3.9	3.8	1

215003 IRM									R		A3 Ability to monitor automatic operations of the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM including: A3.04 Control rod block status 3.5/3.5	3.5	1
215004 SRM		R									K2. Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.01 SRM channels/detectors 2.6/2.8	2.6	1
215005 APRM / LPRM			X								K3. Knowledge of the effect that a loss or malfunction of the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM will have on following: (CFR: 41.7 / 45.4) K3.07 Rod block monitor 3.2/3.3	3.2	1
216000 Nuclear Boiler Instrumentation				X							K4. Knowledge of NUCLEAR BOILER INSTRUMENTATION design feature(s) and/or interlocks which provide for the following: (CFR: 41.7) K4.14 Temperature compensation for reactor water level indication: 3.3/ 3.4	3.3	1
217000 RCIC			X								K3. Knowledge of the effect that a loss or malfunction of the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) will have on following: (CFR: 41.7 / 45.4) K3.02 Reactor vessel pressure 3.6 / 3.6	3.6	1
217000 RCIC					X						K5. Knowledge of the operational implications of the following concepts as they apply to REACTOR CORE ISOLATION COOLING SYSTEM (RCIC): (CFR: 41.5 / 45.3) K5.07 Assist core cooling 3.1 / 3.1	3.1	1
218000 ADS						X					K6. Knowledge of the effect that a loss or malfunction of the following will have on the AUTOMATIC DEPRESSURIZATION SYSTEM: (CFR: 41.7 / 45.7) K6.05 A.C. power: 3.0*/ 3.1*	3.0	1
223001 Primary CTMT and Auxiliaries							X				A1. Ability to predict and/or monitor changes in parameters associated with operating the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES controls including: (CFR: 41.5 / 45.5) A1.11 Reactor building to suppression chamber differential pressure: Plant-Specific 3.1/ 3.2	3.1	1
223002 PCIS/Nuclear Steam Supply Shutoff								X			A2. Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.06 Containment instrumentation failures 3.0/ 3.2	3.0	1
239002 SRVs									X		A3. Ability to monitor automatic operations of the RELIEF/SAFETY VALVES including: (CFR: 41.7 / 45.7) A3.03 Tail pipe temperatures 3.6/3.6	3.6	1
241000 Reactor/Turbine Pressure Regulator										X	A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.16 Lights and alarms 3.3/3.2	3.3	1

259001 Reactor Feedwater									R				A2. Ability to (a) predict the impacts of the following on the REACTOR FEEDWATER SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.01 Pump trip 3.7/3.7	3.7	1
259002 Reactor Water Level Control											X		2.4.34 Knowledge of RO tasks performed outside the main control room during emergency operations including system geography and system implications. RO 3.8/ SRO 3.6	3.8	1
261000 SGTS										R			A3. Ability to monitor automatic operations of the STANDBY GAS TREATMENT SYSTEM including: (CFR: 41.7 / 45.7) A3.01 System flow 3.2 / 3.3	3.2	1
261000 SGTS											X		A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.01 †Off-site release levels: 3.2*/ 4.0*	3.2	1
264000 EDGs									X				A2. Ability to (a) predict the impacts of the following on the EMERGENCY GENERATORS (DIESEL/JET) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.01 Parallel operation of emergency generator 3.5/3.6	3.5	1
218000 ADS											R		A4. Ability to manually operate and/or monitor in the control room: A4.07 ADS valve acoustical monitor noise: 3.5/3.8	3.5	1
201001 CRD Hydraulic												R	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics / reactor behavior / and instrument interpretation. 3.7/ 4.4	3.7	1
215004 SRM	R												K1. Knowledge of the physical connections and/or cause- effect relationships between SOURCE RANGE MONITO (SRM) SYSTEM and the following: K1.06 Reactor vessel 2.8/ 2.8	2.8	1
K/A Category Point Totals:	2	3	3	2	2	2	2	2	4	3	3	2	Group Point Total:		28

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
201003 Control Rod and Drive Mechanism				R								K4. Knowledge of CONTROL ROD AND DRIVE MECHANISM design feature(s) and/or interlocks which provide for the following: K4.02 Detection of an uncoupled rod 3.8/ 3.9	3.8	1
201004 RSCS														
201006 RWM	X											Changed from K4 to K1 to obtain required amount of K1 K1. Knowledge of the physical connections and/or cause- effect relationships between ROD BLOCK MONITOR SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.02 LPRM: 3.2 / 3.1	3.2	1
202001 Recirculation					X							K5. Knowledge of the operational implications of the following concepts as they apply to RECIRCULATION SYSTEM : (CFR: 41.5 / 45.3) K5.10 Motor generator set operation: Plant-Specific 2.8*/ 2.8	2.8	1
204000 RWCU						X						K6. Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR WATER CLEANUP SYSTEM : (CFR: 41.7 / 45.7) K6.05 A. C. power 2.6/2.6	2.6	1
205000 Shutdown Cooling		R										K2 Knowledge of electrical power supplies to the following: K2.02 Motor operated valves 2.5*/ 2.7*	2.5	1
214000 RPIS											X	*Note - No A1 Cat.-placed in G to obtain required number 2.2.24 Ability to analyze the affect of maintenance activities on LCO status. RO 2.6/SRO 3.8	2.6	1
215002 RBM								X				A2. Ability to (a) predict the impacts of the following on the ROD BLOCK MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.03 Loss of associated reference APRM channel: 3.1/3.3	3.1	1
219000 RHR/LPCI: Torus/Pool Cooling Mode						R						K6.Knowledge of the effect that a loss or malfunction of the following will have on the RHR/LPCI-TORUS/SUPPRESSION POOL COOLING MODE: K6.02 D.C. electrical power 2.5*/ 2.8*	2.5	1

300000 Instrument Air									X				A3. Ability to monitor automatic operations of the INSTRUMENT AIR SYSTEM including: (CFR: 41.7 / 45.7) A3.02 Air temperature 2.9/2.7	2.9	1
400000 Component Cooling Water									X				A2. Ability to (a) predict the impacts of the following on the CCWS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: (CFR: 41.5 / 45.6) A2.01 Loss of CCW pump 3.3/ 3.4	3.3	1
K/A Category Point Totals:	2	1	1	1	1	2	1	2	4	2	2	Group Point Total:		19	

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BWR RO Examination Outline
Plant Systems - Tier 2/Group 3

Form ES-401-2 (R8, S1)

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
215001 Traversing In-core Probe						X						K6. Knowledge of the effect that a loss or malfunction of the following will have on the TRAVERSING IN-CORE PROBE: (CFR: 41.7 / 45.7) K6.04 Primary containment isolation system: 3.1/3.4	3.1	1
233000 Fuel Pool Cooling and Cleanup							X					A1. Ability to predict and/or monitor changes in parameters associated with operating the FUEL POOL COOLING AND CLEAN-UP controls including: (CFR: 41.5 / 45.5) A1.03 Pool temperature 3.1/ 3.3	3.1	1
234000 Fuel Handling Equipment	R											K1. Knowledge of the physical connections and/or cause- effect relationships between FUEL HANDLING EQUIPMENT and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.04 †Reactor manual control system: 3.3 / 3.6	3.3	1
239003 MSIV Leakage Control														
268000 Radwaste														
288000 Plant Ventilation	R											K1. Knowledge of the physical connections and/or cause- effect relationships between PLANT VENTILATION SYSTEMS and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.02 Secondary containment 3.4/ 3.4	3.4	1
290002 Reactor Vessel Internals														
K/A Category Point Totals:	2	0	0	0	0	1	1	0	0	0		Group Point Total:		4

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points

Plant-Specific Priority Total: (limit 10)

Facility: Fitzpatrick		Date of Exam: November 2001		Exam Level:RO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.10	Knowledge of conditions and limitations in the facility license. RO 2.7 / SRO 3.9	2.7 RO		
	2.1.19	Ability to use plant computer to obtain and evaluate parametric information on system or component status. RO 3.0/ SRO 3.0	3.0 RO		
	2.1.22	Ability to determine Mode of Operation. RO 2.8 / SRO 3.3	2.8 RO		
Total				3	
Equipment Control	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels. RO 4.0 / SRO 3.5	4.0 RO		
	2.2.23	Ability to track limiting conditions for operations. RO 2.6 / SRO 3.8	2.6 RO		
	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. RO 2.5 / SRO 3.7	2.5 RO		
Total				3	
Radiation Control	2.3.4	Knowledge of radiation exposure limits and contamination control / including permissible levels in excess of those authorized. RO 2.5 / SRO 3.1	2.5 RO		
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. RO 2.9 / SRO 3.3	2.9 RO		
	2.3.11	Ability to control radiation releases. RO 2.7 / SRO 3.2	2.7		

	Total			3
Emergency Procedures/ Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps. RO 4.3 / SRO 4.6	4.3	
	2.4.18	Knowledge of the specific bases for EOPs. RO 2.7 / SRO 3.6	2.7	
	2.4.24	Knowledge of loss of cooling water procedures. RO 3.3 / SRO 3.7	3.3 RO	
	2.4.32	Knowledge of operator response to loss of all annunciators. RO 3.3 / SRO 3.5	3.3	
	Total			4
Tier 3 Point Total (RO/SRO)				13

Facility: FitzPatrick		Date of Examination: November, 2001
Examination Level (circle one): RO		Operating Test Number: _____
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	2.1.7 Ability to Evaluate Plant Performance and Make Operational Judgement Based on Instrument Interpretations. 3.8	JPM - Verification of Core Thermal Power
		N/A
	2.1.1 Knowledge of Conduct of Operations Requirements 3.7	Question 1 Knowledge of Overtime Restrictions
		Question 2 Maintenance of License
A.2	2.2.12 Knowledge of Surveillance Procedures 3.4	JPM Complete surveillance ST-23C, "Jet Pump Operability Test for Two Loop Operation."
		N/A
A.3	2.3.10 Ability to Perform Procedures to Reduce Excessive Levels of Radiation and Guard Against Personnel Exposure. 2.9	Question 1 Under what conditions are RWPs not required
		Question 2 Entry into Very High Radiation Areas
A.4	2.4.39 Knowledge of RO Responsibilities in Emergency Plan Implementation 3.3	JPM Notification of Local Area Governments by the Control Room Communication Aid.
		N/A

Facility: FitzPatrick		Date of Examination: November, 2001
Examination Level (circle one): SRO		Operating Test Number: _____
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	2.1.7 Ability to Evaluate Plant Performance and Make Operational Judgement Based on Instrument Interpretations. 4.4	JPM Verification of Core Thermal Power
		N/A
	2.1.1 Knowledge of Conduct of Operations Requirements 3.8	Question 1 Knowledge of Overtime Restrictions
		Question 2 Shift Manning Requirements
A.2	2.2.12 Knowledge of Surveillance Procedures 3.4	JPM Complete surveillance ST-23C, "Jet Pump Operability Test for Two Loop Operation."
		N/A
A.3	2.3.10 Ability to Perform Procedures to Reduce Excessive Levels of Radiation and Guard Against Personnel Exposure. 3.3	Question 1 Notifications and protective actions for a accident involving radioactive materials
		Question 2 Entry into Very High Radiation Areas
A.4	2.4.41 Knowledge of the emergency levels and classifications 4.1	JPM Given the scenario that has just occurred, classify the event.
		N/A

Facility: FitzPatrick Exam Level (circle one): RO / SRO(I) / SRO(U)		Date of Examination: November 2001 Operating Test No.: _____	
B.1 Control Room Systems			
	System / JPM Title	Type Code*	Safety Function
a.	21201009F Reset an RPS Scram With Scram Valve Failure to Close Plant Condition - SCRAM Time - 10 minutes	D, A	7 212000 A4.14 3.8/3.8
b.	20501016F Place the RHR System in the Torus Cooling Lineup with a Failure of the Minimum Flow Valve to Close. Plant Conditions 100% Power Normal Plant Lineup Time 20 minutes	D, A	5 219000 A2.03 3.1 / 3.2
c.	20601003F Restoration of HPCI after Auto Initiation and High Level Trip with Failure of 23MOV-19 to Close Plant Conditions SCRAM Time 12	D, A	2 20600 A4.13 4.1 / 4.0
d.	NEW Failure of the "A" Reactor Recirculation Pump no. 1 & no. 2 Seal.	N	4 202001, A2.10 3.5, 3.9
e.	21501022 Bypassing Local Power Range Monitor and APRM Failure to Trip	M, A	7 215005 A4.06 3.6 / 3.8
f.	26402003 Perform the Emergency Diesel Generator Load Tests.	M	6 264000 A4.04 3.7 / 3.7

g. 20004240A Reset a Group I Isolation	D	5 223002 A4.03 3.6 / 3.5
B.2 Facility Walk-Through		
a. 20004233A Close an SORV Remotely by Pulling Fuses Location Relay Room Time 6 Minutes	D	3 239002 A2.03 4.1/4.2
b. 2000402246 Suppling Cooling Water to EDG's A & C from Fire Protection Location ESW & EDG Time 15 minutes	D	8 264000 K6.07 3.8 / 3.9
c. 20102015 Changing In-Service CRD Flow Control Valves Location Reactor Building Time 15 minutes	D	1 201001
* 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: FitzPatrick	Scenario No.: <u> 1 </u>	Op-Test No.: <u> </u>
Examiners: _____	Operators: _____	_____
_____	_____	_____
Initial Conditions: Reactor power is at 90%		
Turnover: The plant is at 90% power. All briefings have been completed and the plant is ready to increase power to 100% with recirculation flow. I&C plans to perform MSL high flow testing, they will call before they begin.		

Event No.	Malfunction No.	Event Type*	Event Description
1	NA	R(NCO1)	Raise reactor power to 100% with recirculation flow.
2	NA	N(NCO2)	Swap the running RBCLC pump
3	1	I(NCO1)	B APRM flow bias signal fails low resulting a ½ scram
4	2	M(ALL)	Inadvertent MSIV isolation / Scram
5	3	C(NCO1)	Control rod 06-31 fails to scram
6	4	M(ALL)	SRV-71K inadvertently opens and discharge line breaks above the torus water level.
7	5	C(NCO2)	Loss of Bus 10500 result in the loss of A & B RHR Pumps
8	6	C(NCO2)	D RHR pump trips after start. Emergency depressurization based on not being able to maintain torus pressure below pressure suppression pressure limit.
		NOTES:	1. Determine an acceptable leakage rate for the SRV line break. 2. Determine if ED will be based on PSP or RPV Level.

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

Facility: FitzPatrick		Scenario No.: <u> 2 </u>	Op-Test No.: _____
Examiners: _____		Operators: _____	
Initial Conditions:		The plant is at 95% power with a shutdown in progress. ST-24J, "RCIC Flow Rate and Inservice Test (IST)," is required as per an operability evaluation.	
Turnover:		Plant is currently being shutdown for condenser tube cleaning and a small EHC oil leak at the discharge of the "B" EHC pump.	
Event No.	Malfunction No.	Event Type*	Event Description
1	NA	R(NCO1)	Start power reduction from 95% power by reducing reactor recirculation flow.
2	NA	N(NCO2)	Swap the running TBCLC pump.
3	1	C(NCO1)	Trip of running CRD Pump due to a fault in the CRD pump motor / 1 accumulator alarm - low N2 pressure.
4	2	C(NCO2)	EHC pressure decreasing, when second pump starts the EHC line shears and EHC pressure lost.
5	3	M(ALL)	Turbine trip
6	4	C(NCO1)	Failure to scram / ATWS due to a hydraulic lock
7	5	C(NCO2)	BPV close as the EHC accumulators bleed down.
8	6	C(NCO2)	RCIC over speeds and trips on startup. Must manually recover.
		NOTE	<ol style="list-style-type: none"> 1. Determine EHC leak size to allow the candidates to react. 2. Determine the power level after the scram so that candidates can control the plant not just react to plant events.

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