

Facility:		James A. Fitzpatrick					Date of Exam:		March 2016									
Tier	Group	RO K/A Category Points											SRO-Only Points					
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total		
1. Emergency & Abnormal Plant Evolutions	1	3	3	3				3	4			4	20	3	4	7		
	2	1	1	1				2	1			1	7	2	1	3		
	Tier Totals	4	4	4				5	5			5	27	5	5	10		
2. Plant Systems	1	2	2	2	2	3	3	2	3	2	3	2	26	2	3	5		
	2	2	0	1	1	1	1	2	1	1	1	1	12	0	2	3		
	Tier Totals	4	2	3	3	4	4	4	4	3	4	3	38	4	4	8		
3. Generic Knowledge & Abilities Categories					1		2		3		4		10	1	2	3	4	7
					2		3		2		3			1	2	2	2	

- Note:
- Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two). (One Tier 3 Radiation Control K/A is allowed if the K/A is replaced by a K/A from another Tier 3 Category.)
  - The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
  - Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted with justification; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
  - Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
  - Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
  - Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
  - The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.
  - On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in a category other than Category A2 or G\* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
  - For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

G\* Generic KIAs

JAF 16-1 NRC Exam  
Written Examination Outline  
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
700000 Generator Voltage and Electric Grid Disturbances / 6					X		AA2.09 - Ability to determine and/or interpret the following as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Operational status of emergency diesel generators	4.3	76
295004 Partial or Complete Loss of DC Power / 6					X		AA2.02 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: Extent of partial or complete loss of D.C. power	3.9	77
295019 Partial or Complete Loss of Instrument Air / 8					X		AA2.02 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR: Status of safety-related instrument air system loads (see AK2.1 - AK2.19)	3.7	78
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4						X	2.1.23 - Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.4	79
295003 Partial or Complete Loss of AC Power / 6						X	2.1.20 - Conduct of Operations: Ability to interpret and execute procedure steps.	4.6	80
295028 High Drywell Temperature / 5						X	2.1.7 - Conduct of Operations: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.7	81
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1						X	2.4.18 - Emergency Procedures / Plan: Knowledge of the specific bases for EOPs.	4.0	82
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1	X						EK1.03 - Knowledge of the operational implications of the following concepts as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: Boron effects on reactor power (SBLC)	4.2	39
295021 Loss of Shutdown Cooling / 4	X						AK1.02 - Knowledge of the operational implications of the following concepts as they apply to LOSS OF SHUTDOWN COOLING: Thermal stratification	3.3	40
295028 High Drywell Temperature / 5	X						EK1.02 - Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL TEMPERATURE: Equipment environmental qualification	2.9	41
295025 High Reactor Pressure / 3		X					EK2.01 - Knowledge of the interrelations between HIGH REACTOR PRESSURE and the following: RPS	4.1	42
295016 Control Room Abandonment / 7		X					AK2.02 - Knowledge of the interrelations between CONTROL ROOM ABANDONMENT and the following: Local control stations: Plant-Specific	4.0	43
295003 Partial or Complete Loss of AC Power / 6		X					AK2.04 - Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF A.C. POWER and the following: A.C. electrical loads	3.4	44

JAF 16-1 NRC Exam  
Written Examination Outline  
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
295019 Partial or Complete Loss of Instrument Air / 8			X				AK3.02 - Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR: Standby air compressor operation	3.5	45
295024 High Drywell Pressure / 5			X				EK3.06 - Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL PRESSURE: Reactor SCRAM	4.0	46
295030 Low Suppression Pool Water Level / 5			X				EK3.07 - Knowledge of the reasons for the following responses as they apply to LOW SUPPRESSION POOL WATER LEVEL: NPSH considerations for ECCS pumps	3.5	47
295031 Reactor Low Water Level / 2				X			EA1.12 - Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL: Feedwater	3.9	48
600000 Plant Fire On-site / 8				X			AA1.06 - Ability to operate and / or monitor the following as they apply to PLANT FIRE ON SITE: Fire alarm	3.0	49
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4				X			AA1.05 - Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: Recirculation flow control system	3.3	50
295018 Partial or Complete Loss of CCW / 8					X		AA2.01 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: Component temperatures	3.3	51
295005 Main Turbine Generator Trip / 3					X		AA2.05 - Ability to determine and/or interpret the following as they apply to MAIN TURBINE GENERATOR TRIP: Reactor power	3.8	52
295038 High Off-site Release Rate / 9					X		EA2.03 - Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE: Radiation levels	3.5	53
295004 Partial or Complete Loss of DC Power / 6						X	2.2.37 - Equipment Control: Ability to determine operability and/or availability of safety related equipment.	3.6	54
295006 SCRAM / 1						X	2.4.35 - Emergency Procedures / Plan: Knowledge of local auxiliary operator tasks during emergency and the resultant operational effects.	3.8	55
295023 Refueling Accidents / 8						X	2.4.45 - Emergency Procedures / Plan: Ability to prioritize and interpret the significance of each annunciator or alarm.	4.1	56
295026 Suppression Pool High Water Temperature / 5					X		EA2.03 - Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Reactor pressure	3.9	57
700000 Generator Voltage and Electric Grid Disturbances / 6						X	2.4.9 - Emergency Procedures / Plan: Knowledge of low power / shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.	3.8	58
K/A Category Totals:	3	3	3	3	4/3	4/4	Group Point Total:	20/7	

JAF 16-1 NRC Exam  
Written Examination Outline  
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
295015 Incomplete SCRAM / 1					X		AA2.02 - Ability to determine and/or interpret the following as they apply to INCOMPLETE SCRAM: Control rod position	4.2	83
295034 Secondary Containment Ventilation High Radiation / 9						X	2.4.41 - Emergency Procedures / Plan: Knowledge of the emergency action level thresholds and classifications.	4.6	84
295036 Secondary Containment High Sump/Area Water Level / 5					X		EA2.03 - Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL: Cause of the high water level	3.8	85
295034 Secondary Containment Ventilation High Radiation / 9	X						EK1.01 - Knowledge of the operational implications of the following concepts as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION: Personnel protection	3.8	59
295033 High Secondary Containment Area Radiation Levels / 9		X					EK2.01 - Knowledge of the interrelations between HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS and the following: Area radiation monitoring system	3.8	60
295002 Loss of Main Condenser Vacuum / 3			X				AK3.06 - Knowledge of the reasons for the following responses as they apply to LOSS OF MAIN CONDENSER VACUUM: Air ejector flow	2.9	61
295036 Secondary Containment High Sump/Area Water Level / 5				X			EA1.01 - Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL: Secondary containment equipment and floor drain systems	3.2	62
295015 Incomplete SCRAM / 1					X		AA2.01 - Ability to determine and/or interpret the following as they apply to INCOMPLETE SCRAM: Reactor power	4.1	63
295017 High Off-site Release Rate / 9						X	2.4.6 - Emergency Procedures / Plan: Knowledge of EOP mitigation strategies.	3.7	64
295022 Loss of CRD Pumps / 1				X			AA1.04 - Ability to operate and/or monitor the following as they apply to LOSS OF CRD PUMPS: Reactor water cleanup system: Plant-Specific	2.5	65
K/A Category Totals:	1	1	1	2	1/2	1/1	Group Point Total:	7/3	

JAF 16-1 NRC Exam  
 Written Examination Outline  
 Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	Imp.	Q#
-----------------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	---	------	----

217000 RCIC								X					A2.07 - Ability to (a) predict the impacts of the following on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of lube oil	3.1	86
218000 ADS								X					A2.06 - Ability to (a) predict the impacts of the following on the AUTOMATIC DEPRESSURIZATION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: ADS initiation signals present	4.3	87
215005 APRM / LPRM											X		2.4.46 - Emergency Procedures / Plan: Ability to verify that the alarms are consistent with the plant conditions.	4.2	88
212000 RPS											X		2.2.44 - Equipment Control: Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.	4.4	89
400000 Component Cooling Water											X		2.2.40 - Equipment Control: Ability to apply technical specifications for a system.	4.7	90
262001 AC Electrical Distribution	X												K1.05 - Knowledge of the physical connections and/or cause-effect relationships between A.C. ELECTRICAL DISTRIBUTION and the following: Main turbine/generator	3.0	1
217000 RCIC	X												K1.02 - Knowledge of the physical connections and/or cause-effect relationships between REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) and the following: Nuclear boiler system	3.5	2
400000 Component Cooling Water		X											K2.02 - Knowledge of electrical power supplies to the following: CCW valves	2.9	3
205000 Shutdown Cooling		X											K2.01 - Knowledge of electrical power supplies to the following: Pump motors	3.1	4

JAF 16-1 NRC Exam  
 Written Examination Outline  
 Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	Imp.	Q#
262002 UPS (AC/DC)			X									2.9	5
218000 ADS			X									4.5	6
211000 SLC				X								3.4	7
215003 IRM				X								2.6	8
215005 APRM / LPRM					X							2.5	9
212000 RPS					X							3.3	10
203000 RHR/LPCI: Injection Mode						X						3.0	11
215004 Source Range Monitor						X						2.6	12
259002 Reactor Water Level Control							X					2.9	13

JAF 16-1 NRC Exam  
 Written Examination Outline  
 Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	Imp.	Q#
209001 LPCS							X					3.2	14
261000 SGTS								X				2.9	15
223002 PCIS/Nuclear Steam Supply Shutoff								X				3.9	16
239002 SRVs									X			3.6	17
264000 EDGs									X			3.4	18
206000 HPCI										X		4.0	19
263000 DC Electrical Distribution										X		3.2	20
300000 Instrument Air											X	4.2	21
263000 DC Electrical Distribution											X	4.0	22
215004 Source Range Monitor											X	3.0	23

JAF 16-1 NRC Exam  
 Written Examination Outline  
 Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	Imp.	Q#
206000 HPCI					X							3.3	24
212000 RPS								X				4.0	25
239002 SRVs						X						3.0	26
K/A Category Totals: ,	2	2	2	2	3	3	2	3/2	2	3	2/3	Group Point Total: 26/5	

K5.01 - Knowledge of the operational implications of the following concepts as they apply to HIGH PRESSURE COOLANT INJECTION SYSTEM: Turbine operation: BWR-2,3,4

A2.11 - Ability to (a) predict the impacts of the following on the REACTOR PROTECTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Main steamline isolation valve closure

K6.05 - Knowledge of the effect that a loss or malfunction of the following will have on the RELIEF/SAFETY VALVES: Discharge line vacuum breaker



JAF 16-1 NRC Exam  
 Written Examination Outline  
 Plant Systems – Tier 2 Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	Imp.	Q#	
204000 RWCU								X					2.9	91
272000 Radiation Monitoring											X		4.3	92
286000 Fire Protection								X					3.0	93
271000 Off-gas	X												3.1	27
202002 Recirculation Flow Control	X												3.7	28
239003 MSIV Leakage Control			X										3.3	29
241000 Reactor/Turbine Pressure Regulator				X									3.6	30
201001 CRD Hydraulic					X								2.6	31

JAF 16-1 NRC Exam  
 Written Examination Outline  
 Plant Systems – Tier 2 Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	Imp.	Q#
223001 Primary Containment System and Auxiliaries						X						3.4	32
256000 Reactor Condensate							X					2.9	33
201002 RMCS								X				3.2	34
233000 Fuel Pool Cooling/Cleanup									X			2.6	35
290003 Control Room HVAC										X		2.8	36
204000 RWCU											X	4.1	37
201003 Control Rod and Drive Mechanism							X					2.9	38
K/A Category Totals:	2	0	1	1	1	1	2	1/2	1	1	1/1	Group Point Total: 12/3	

Facility:		James A. Fitzpatrick	Date:		March 2016	
Category	K/A #	Topic	RO		SRO-Only	
			IR	Q#	IR	Q#
1. Conduct of Operations	2.1.35	Knowledge of the fuel-handling responsibilities of SROs.			3.9	94
	2.1.1	Knowledge of conduct of operations requirements.	3.8	66		
	2.1.4	Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc.	3.3	67		
	Subtotal			2	1	
2. Equipment Control	2.2.22	Knowledge of limiting conditions for operations and safety limits.			4.7	95
	2.2.42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.			4.6	100
	2.2.43	Knowledge of the process used to track inoperable alarms.	3.0	68		
	2.2.41	Ability to obtain and interpret station electrical and mechanical drawings.	3.5	69		
	2.2.39	Knowledge of less than one hour technical specification action statements for systems.	3.9	74		
	Subtotal			3	2	
3. Radiation Control	2.3.11	Ability to control radiation releases.			4.3	96
	2.3.13	Knowledge of Radiological Safety Procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high radiation areas, aligning filters, etc.			3.8	98
	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9	70		

	2.3.7	Ability to comply with radiation work permit requirements during normal or abnormal conditions.	3.5	71		
	Subtotal			2		2
4. Emergency Procedures / Plan	2.4.34	Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.			4.1	97
	2.4.28	Knowledge of procedures relating to a security event (non-safeguards information).			4.1	99
	2.4.19	Knowledge of EOP layout, symbols, and icons.	3.4	72		
	2.4.1	Knowledge of EOP entry conditions and immediate action steps.	4.6	73		
	2.4.32	Knowledge of operator response to loss of all annunciators.	3.6	75		
	Subtotal			3		2
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
The following topics / K/As were excluded from the systematic and random sampling process:		
1 / 1	295027 High Containment Temperature	This topic applies to plants with Mark III containments only. The facility has a Mark I containment.
1 / 2	295011 High Containment Temperature	This topic applies to plants with Mark III containments only. The facility has a Mark I containment.
2 / 1	207000 Isolation (Emergency) Condenser	This system is not installed at the facility.
2 / 1	209002 HPCS	This system is not installed at the facility.
2 / 2	201004 RSCS	This system is no longer installed at the facility.
2 / 2	201005 RCIS	This system is not installed at the facility.
G	2.2.3 Knowledge of the design, procedural, and operational differences between units.	This K/A applies to multi-unit facilities only.
G	2.2.4 Ability to explain the variations in control board/control room layouts, systems, instrumentation, and procedural actions between units at a facility.	This K/A applies to multi-unit facilities only.

The following K/As were rejected following the systematic and random sampling process:		
1 / 1	<p>Question 76</p> <p>700000 Generator Voltage and Electric Grid Disturbances</p> <p>AA2.06 - Ability to determine and/or interpret the following as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Generator frequency limitations</p>	<p>An acceptable question could not be developed for the randomly selected K/A due to lack of proceduralized Generator frequency limitations related to voltage or grid disturbances at the facility.</p> <p>Randomly re-selected K/A 700000 Generator Voltage and Electric Grid Disturbances AA2.09 - Ability to determine and/or interpret the following as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Operational status of emergency diesel generators.</p>
1 / 1	<p>Question 80</p> <p>295003 Partial or Complete Loss of AC Power</p> <p>2.4.34 - Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.</p>	<p>An acceptable question could not be developed for the randomly selected generic K/A due to lack of RO-specific tasks performed outside the main control room related to a loss of AC power event.</p> <p>Randomly re-selected K/A 295003 Partial or Complete Loss of AC Power 2.1.20 - Ability to interpret and execute procedure steps.</p>
1 / 1	<p>Question 82</p> <p>295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown</p> <p>2.2.25 - Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.</p>	<p>An acceptable question could not be developed for the randomly selected generic K/A due to lack of Technical Specification bases related to the beyond design basis event of a failure to scram.</p> <p>Randomly re-selected K/A 295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown 2.4.18 - Knowledge of the specific bases for EOPs.</p>
1 / 2	<p>Question 84</p> <p>295034 Secondary Containment Ventilation High Radiation</p> <p>2.1.32 - Ability to explain and apply all system limits and precautions.</p>	<p>An acceptable question could not be developed at the SRO level for the randomly selected generic K/A due to lack of documented system limits / precautions associated with Secondary Containment Ventilation high radiation.</p> <p>Randomly re-selected K/A 295034 Secondary Containment Ventilation High Radiation 2.4.41 - Knowledge of the emergency action level thresholds and classifications.</p>

2 / 1	<p>Question 90 400000 Component Cooling Water</p> <p>2.4.1 - Knowledge of EOP entry conditions and immediate action steps.</p>	<p>An acceptable question could not be developed at the SRO level for the randomly selected generic K/A due to lack of EOP entry conditions and immediate action steps associated with Component Cooling Water.</p> <p>Randomly re-selected K/A 400000 Component Cooling Water 2.2.40 - Ability to apply technical specifications for a system.</p>
2 / 1	<p>Question 10 212000 RPS</p> <p>K5.01 - Knowledge of the operational implications of the following concepts as they apply to REACTOR PROTECTION SYSTEM: Fuel thermal time constant</p>	<p>An acceptable question could not be written for the randomly selected K/A without testing minutia or GFE knowledge.</p> <p>Randomly re-selected K/A 212000 RPS K5.02 - Knowledge of the operational implications of the following concepts as they apply to REACTOR PROTECTION SYSTEM: Specific logic arrangements.</p>
2 / 1	<p>Question 21 300000 Instrument Air</p> <p>2.2.40 - Ability to apply technical specifications for a system.</p>	<p>An acceptable question could not be developed for the randomly selected K/A at the correct license level due to lack of appropriate Technical Specifications related directly to Instrument Air.</p> <p>Randomly re-selected K/A 300000 Instrument Air 2.4.31 - Knowledge of annunciator alarms, indications, or response procedures.</p>
2 / 2	<p>Question 28 202002 Recirculation Flow Control</p> <p>K2.02 - Knowledge of electrical power supplies to the following: Hydraulic power unit: Plant-Specific</p>	<p>The facility does not have hydraulic power units related to Recirculation Flow Control.</p> <p>Randomly re-selected K/A 202002 Recirculation Flow Control K1.03 - Knowledge of the physical connections and/or cause-effect relationships between RECIRCULATION FLOW CONTROL SYSTEM and the following: Reactor core flow.</p>
2 / 2	<p>Question 37 204000 RWCU</p> <p>2.2.37 - Ability to determine operability and / or availability of safety related equipment.</p>	<p>An acceptable question could not be developed for the randomly selected K/A at the appropriate license level due to lack of safety related function in the RWCU system.</p> <p>Randomly re-selected K/A 204000 RWCU 2.1.28 - Knowledge of the purpose and function of major system components and controls.</p>

1 / 1	<p>Question 54</p> <p>295004 Partial or Complete Loss of DC Power</p> <p>2.4.2 - Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.</p>	<p>An acceptable question could not be developed for the randomly selected K/A due to lack of association between Loss of DC Power and EOP entry conditions.</p> <p>Randomly re-selected K/A 295004 Partial or Complete Loss of DC Power 2.2.37 - Ability to determine operability and/or availability of safety related equipment.</p>
1 / 2	<p>Question 60</p> <p>295033 High Secondary Containment Area Radiation Levels</p> <p>EK2.03 - Knowledge of the interrelations between HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS and the following: Secondary containment ventilation: Plant-Specific</p>	<p>An acceptable question could not be developed for the randomly selected K/A due to a lack of plant-specific interrelation between high area radiation levels and Secondary Containment ventilation.</p> <p>Randomly re-selected K/A 295033 High Secondary Containment Area Radiation Levels EK2.01 - Knowledge of the interrelations between HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS and the following: Area radiation monitoring system.</p>
1 / 2	<p>Question 62</p> <p>295036 Secondary Containment High Sump/Area Water Level</p> <p>EA1.04 - Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL: Radiation monitoring: Plant-Specific</p>	<p>An acceptable question could not be developed for the randomly selected K/A without overlapping concepts tested in Question 85 due to limited relationship between high sump/area water levels and radiation monitoring.</p> <p>Randomly re-selected K/A 295036 Secondary Containment High Sump/Area Water Level EA1.01 - Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL: Secondary containment equipment and floor drain systems.</p>
1 / 2	<p>Question 64</p> <p>295017 High Off-site Release Rate</p> <p>2.1.25 - Ability to interpret reference materials, such as graphs, curves, tables, etc.</p>	<p>An acceptable question could not be developed for the randomly selected K/A due to lack of reference materials related to high offsite release rate that would be used by an RO.</p> <p>Randomly re-selected K/A 295017 High Off-site Release Rate 2.4.6 - Knowledge of EOP mitigation strategies.</p>



2 / 1	<p>Question 22 263000 DC Electrical Distribution</p> <p>2.4.50 - Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.</p>	<p>An acceptable question could not be developed for the randomly selected K/A without testing minutia.</p> <p>Randomly re-selected K/A 263000 DC Electrical Distribution 2.4.11 - Knowledge of abnormal condition procedures.</p>
2 / 2	<p>Question 33 256000 Reactor Condensate</p> <p>A1.08 - Ability to predict and/or monitor changes in parameters associated with operating the REACTOR CONDENSATE SYSTEM controls including: System water quality</p>	<p>Rejected KA due to low Operational value for discriminating RO level question.</p> <p>Randomly re-selected K/A 256000 Reactor Condensate A1.04 - Ability to predict and/or monitor changes in parameters associated with operating the REACTOR CONDENSATE SYSTEM controls including: Hotwell level.</p>
3	<p>Question 67 2.1.18 - Ability to make accurate, clear and concise logs, records, status boards, and reports.</p>	<p>The randomly selected K/A is tested extensively on the operating exam and better suited to that portion of the exam.</p> <p>Randomly re-selected K/A 2.1.4 - Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc.</p>
1 / 1	<p>Question 81 295028 High Drywell Temperature</p> <p>2.2.22 - Knowledge of limiting conditions for operations and safety limits.</p>	<p>An adequate question could not be developed for the randomly selected K/A without overlapping one of the administrative JPMs.</p> <p>Randomly re-selected K/A 295028 High Drywell Temperature 2.1.7 - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.</p>
3	<p>Question 71 2.3.7 – Ability to comply with radiation work permit requirements during normal or abnormal conditions.</p>	<p>Removed based on Chief Examiner discretion.</p> <p>Randomly re-selected K/A 2.3.14 – Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.</p>

Facility: <u>James A. Fitzpatrick</u>		Date of Examination: <u>March 2016</u>
Examination Level: <u>RO</u>		Operating Test Number: <u>16-1</u>
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M, R	Manually Compute Average Drywell Air Temperature K/A 2.1.20 (4.6), ST-40C
Conduct of Operations	M, R	Determine Work Hour Limitations K/A 2.1.5 (2.9), EN-OM-123
Equipment Control	D, R	Determine Tagout Isolation Boundary for CRD Pump K/A 2.2.13 (4.1), EN-OP-102
Radiation Control	P, D, R 14-2 NRC	Determine Worker Exposure for Emergent Work K/A 2.3.4 (3.2), EN-RP-201
Emergency Procedures/Plan		
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank ( $\leq 3$ for ROs; $\leq 4$ for SROs & RO retakes) (N)ew or (M)odified from bank ( $\geq 1$ ) (P)revious 2 exams ( $\leq 1$ ; randomly selected)		

Facility: James A. Fitzpatrick  
 Examination Level: SRO

Date of Examination: March 2016  
 Operating Test Number: 16-1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M, R	Manually Compute Average Drywell Air Temperature, Determine Technical Specification Implications K/A 2.1.20 (4.6), ST-40C
Conduct of Operations	M, R	Determine Work Hour Limitations and Actions for Waiver K/A 2.1.5 (3.9), EN-OM-123
Equipment Control	D, R	Review Tagout Isolation Boundary for CRD Pump K/A 2.2.13 (4.3), EN-OP-102
Radiation Control	M, R	Determine Worker Exposure for Emergent Work and Required Actions K/A 2.3.4 (3.7), EN-RP-201
Emergency Plan	P, D, R	Determine Emergency Classification and Initiate Event Notification K/A 2.4.40 (4.5), IAP-1, IAP-2

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

\* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom  
 (D)irect from bank ( $\leq 3$  for ROs;  $\leq 4$  for SROs & RO retakes)  
 (N)ew or (M)odified from bank ( $\geq 1$ )  
 (P)revious 2 exams ( $\leq 1$ ; randomly selected)

Facility: <u>James A. Fitzpatrick</u>		Date of Examination: <u>March 2016</u>
Exam Level: <u>RO/SRO</u>		Operating Test No.: <u>16-1</u>
Control Room Systems:* 8 for RO; 7 for SRO-I; 2 or 3 for SRO-U		
System / JPM Title	Type Code*	Safety Function
a. Transfer Bus 10100 from Reserve to Normal Using Single Meter Voltage Match Method K/A 262001 A4.04 (3.6/3.7), OP-46A	P, D, A, S 14-1 NRC	6
b. Perform Actions for Fire in Plant K/A 600000 AA2.17 (3.1/3.6), AOP-28	D, A, S	1
c. Perform HPCI Full-Flow Test, Steam Leak with Failure to Automatically Isolate K/A 206000 A4.03 (3.1/3.0), ST-4N, ARP 09-3-3-2(13)	M, A, EN, S	2
d. Reset ARI and Scram, Perform Post Scram Reset Control Rod Position Check K/A 212000 A4.14 (3.8/3.8), AOP-1	M, EN, S	7
e. Place Shutdown Cooling in Service K/A 205000 A4.01 (3.7/3.7), AOP-30	D, L, S	4
f. Recover Turbine Building Ventilation After Exhaust Duct Radiation Monitor Trip Isolation K/A 288000 A4.01 (3.1/2.9), OP-52	D, S	9
g. Supply Ventilation Loads with Emergency Service Water K/A 400000 A4.01 (3.1/3.0), AOP-11	N, EN, S	8
h. <b>(RO Only)</b> Perform Main Turbine Roll K/A 241000 A4.11 (3.1/3.1), OP-9	N, L, S	3
In-Plant Systems* (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Vent Torus to Lower Primary Containment Pressure K/A 295010 AA1.05 (3.1/3.4), EP-6	P, D, A, E 14-2 NRC	5
j. Vent the Scram Air Header K/A 400000 2.4.35 (3.8/4.0), EP-3	D, R, E	8
k. Swap CRD Flow Control Valves K/A 201001 2.1.20 (4.6/4.6), OP-25	D, R	1

<p>* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p>	
* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered safety feature	$\geq 1 / \geq 1 / \geq 1$ (control room system)
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

Facility: James A. FitzpatrickScenario No.: NRC-1Op-Test No.: 16-1

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

Initial Conditions: The plant is operating at approximately 100% power. Core Spray A is out of service for maintenance.

Turnover: Perform Core Spray valve testing per ST-3PA. The procedure is in progress up to step 8.4.4. Complete section 8.4 and then hold.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Perform Core Spray Valve Testing ST-3PA
2	NM14:B	I – ATC, SRO	APRM B Fails Upscale OP-16, ARP 09-5-1-4
3	Remote HP15	C – SRO	HPCI Aux Oil Pump Power Supply Loss ARP 09-3-3-38, Technical Specifications
4	RD06 RD09	C – BOP, SRO	Control Rod Drive Pump Trip, One Control Rod Drive Accumulator Low Pressure AOP-69, ARP-09-5-1-43, Technical Specifications
5	TU04	R – ATC, SRO C – BOP	Main Turbine Vibration AOP-66, AOP-1, EOP-2
6	RD13	M – All	Hydraulic ATWS EOP-3
7	SL01	C – ATC, SRO	Delayed SLC Pump Trip (first pump only, maybe after 1-2 minutes) EOP-3
8	RR02 RR13	I – ATC, SRO	Recirculation Flow Controllers Fail As-Is; Recirculation Pumps Fail to Automatically Trip EOP-3
9	TC04	C – BOP, SRO	Turbine Bypass Valves Fail Partially Closed EOP-3

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

Facility: <b>James A. Fitzpatrick</b>	Scenario No.: <b>NRC-1</b>	Op-Test No.: <b>16-1</b>
1. Total malfunctions (5-8) <b>Events 2,3,4,5,6,7,8,9</b>	8	
2. Malfunctions after EOP entry (1-2) <b>Events 7,8,9</b>	3	
3. Abnormal events (2-4) <b>Events 4 &amp; 5</b>	2	
4. Major transients (1-2) <b>Event 6</b>	1	
5. EOPs entered/requiring substantive actions (1-2) <b>EOP-2</b>	1	
6. EOP contingencies requiring substantive actions (0-2) <b>EOP-3</b>	1	
7. Critical tasks (2-3)	2	
<b>CRITICAL TASK DESCRIPTIONS:</b>		
<p><b>CT-1: Given a failure to scram with Reactor power above 2.5%, the crew will lower Reactor power by one or more of the following methods, in accordance with EOP-3:</b></p> <ul style="list-style-type: none"> <li>• Terminating and preventing all RPV injection except SLC, RCIC, and CRD</li> <li>• Tripping Recirculation pumps</li> <li>• Injecting boron</li> </ul> <p><b>CT-2: Given a failure to scram, the crew will initiate Control Rod insertion, in accordance with EOP-3.</b></p>		

Facility: James A. FitzpatrickScenario No.: NRC-2Op-Test No.: 16-1

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

Initial Conditions: The plant is operating at approximately 73% power to support Circulating Water system maintenance and a control rod pattern adjustment. Core Spray A is out of service for maintenance.

Turnover: Swap Circulating Water pumps per OP-4 section G.5.3. Start Circulating Water pump C and then secure Circulating Water pump B.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Swap Circulating Water Pumps OP-4
2	N/A	R – ATC, SRO	Perform Control Rod Pattern Adjustment OP-26
3	RD10	C – ATC, SRO	Stuck Control Rod OP-25
4	Override	C – SRO	Core Spray Sparger Leak ARP 09-3-2-1, Technical Specifications
5	ED19:D	C – BOP, SRO	Electrical Fault on 10400 Bus AOP-17, AOP-8, AOP-60, Technical Specifications
6	RR15:A MS02:A	M – All	Loss of Coolant Accident AOP-1, EOP-2, EOP-4
7	RH14	C – BOP, SRO	RHR Pumps Fail to Automatically Start EOP-2
8	FW19:A HP01	C – ATC, SRO	Condensate Pump A Trips; HPCI Fails to Automatically Start EOP-2
9	HP02	C – All	HPCI Trips EOP-2

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



Facility: <b>James A. Fitzpatrick</b>	Scenario No.: <b>NRC-2</b>	Op-Test No.: <b>16-1</b>
1. Total malfunctions (5-8) <b>Events 3,4,5,6,7,8,9</b>	7	
2. Malfunctions after EOP entry (1-2) <b>Events 7,8,9</b>	3	
3. Abnormal events (2-4) <b>Events 3 &amp; 5</b>	2	
4. Major transients (1-2) <b>Event 6</b>	1	
5. EOPs entered/requiring substantive actions (1-2) <b>EOP-2, EOP-4</b>	2	
6. EOP contingencies requiring substantive actions (0-2) <b>EOP-2 Alt Level Leg, EOP-2 Emergency Depress Leg</b>	2	
7. Critical tasks (2-3)	2	
<b>CRITICAL TASK DESCRIPTIONS:</b>		
<p><b>CT-1: Given a coolant leak inside the Containment, the crew will spray the Drywell, in accordance with EOP-4.</b></p> <p><b>CT-2: Given a coolant leak, a loss of high pressure injection systems, and the inability to restore and maintain Reactor water level above the Top of Active Fuel (TAF), the crew will initiate actions for an Emergency RPV Depressurization, in accordance with EOP-2.</b></p>		

Facility: James A. FitzpatrickScenario No.: NRC-3Op-Test No.: 16-1

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

Initial Conditions: The plant is operating at approximately 100% power. A down-power is required to support water box cleaning.

Turnover: Test EHC pump B auto-start capability per OP-8 section G.2. Secure EHC pump A following the test. Then, lower Reactor power with Recirculation flow. Stop at approximately 80% power for further Reactor Engineering direction.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Test EHC Pump B Auto-Start, Secure EHC Pump A OP-8
2	N/A	R – ATC, SRO	Lower Reactor Power with Recirculation Flow OP-27
3	Override	I – ATC, SRO	Recirculation Pump A Speed Drifts Low AOP-8, AOP-32, OP-27, Technical Specifications
4	Remote EP09 ED43:A	C – SRO	Seismic Event with Loss of Line 3 AOP-14, AOP-72, Technical Specifications
5	RR04:A RR05:A	C – All	Recirculation Pump A Seal Failure ARP 09-4-2-38, AOP-8, OP-27, AOP-39, Technical Specifications
6	Remote EP09 MS02	C – All	Seismic Event with Steam Leak in Drywell AOP-14, AOP-39, AOP-1, EOP-2, EOP-4
7	RH10 Overrides	M – All	RHR Suction Piping Leak; RHR Suction Fails to Isolate EOP-2, EOP-4
8	RP01A RP01B	I – ATC, SRO	RPS Fails to Scram the Reactor EOP-2, AOP-1
9	RD10	C – All	Multiple Control Rods Fail to Insert EOP-3, EOP-3a

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

Facility: <b>James A. Fitzpatrick</b>	Scenario No.: <b>NRC-3</b>	Op-Test No.: <b>16-1</b>
1. Total malfunctions (5-8) <b>Events 3,4,5,6,7,8,9</b>	7	
2. Malfunctions after EOP entry (1-2) <b>Events 8 &amp; 9</b>	2	
3. Abnormal events (2-4) <b>Events 3,4,5,6</b>	4	
4. Major transients (1-2) <b>Event 7</b>	1	
5. EOPs entered/requiring substantive actions (1-2) <b>EOP-2, EOP-4</b>	2	
6. EOP contingencies requiring substantive actions (0-2) <b>EOP-3, EOP-3a</b>	2	
7. Critical tasks (2-3)	3	
<b>CRITICAL TASK DESCRIPTIONS:</b>		
<p><b>CT-1: Given the need for a Reactor scram and failure of RPS to insert control rods, the crew will initiate ARI, in accordance with AOP-1 and/or EOP-3.</b></p> <p><b>CT-2: Given an un-isolable Torus water leak and the inability to maintain Torus water level above 10.75', the crew will initiate a manual HPCI turbine trip, in accordance with EOP-4.</b></p> <p><b>CT-3: Given an un-isolable Torus water leak and the inability to maintain Torus water level above 9.58', the crew will perform an Emergency RPV Depressurization, in accordance with EOP-3a.</b></p>		

Facility: James A. FitzpatrickScenario No.: NRC-4Op-Test No.: 16-1

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

Initial Conditions: The plant is operating at approximately 7% power. A startup is in progress. The RWM is inoperable and bypassed.

Turnover: Transition to Mode 1 and withdraw IRMs. Then continue withdrawing control rods per the startup sequence.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Transition to Mode 1 OP-65
2	N/A	R – ATC, SRO	Withdraw Control Rods OP-65, OP-26
3	RD08	C – ATC, SRO	Control Rod Double Notches OP-26
4	Remote ED23	I – BOP, SRO	LPCI Inverter Trips ARP 09-8-3-2, Technical Specifications
5	CU07 CU10 CU12	C – BOP, SRO	RWCU Pump Seal Fails; RWCU Automatic Isolation Fails ARP 09-3-3-2(12), EOP-5, Technical Specifications
6	RC06	C – BOP, SRO	RCIC Inadvertently Initiates AOP-77, Technical Specifications
7	RC09 RC12 Remote	M – All	RCIC Steam Leak; RCIC Fails to Isolate EOP-5, AOP-1, EOP-2
8	Override	C – ATC, SRO	Bypass Opening Jack Fails EOP-2
9	AD07	C – BOP, SRO	Multiple SRVs Fail to Open EOP-2

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

Facility: <b>James A. Fitzpatrick</b>	Scenario No.: <b>NRC-4</b>	Op-Test No.: <b>16-1</b>
1. Total malfunctions (5-8) <b>Events 3,4,5,6,7,8,9</b>	7	
2. Malfunctions after EOP entry (1-2) <b>Events 8 &amp; 9</b>	2	
3. Abnormal events (2-4) <b>Events 5 &amp; 6</b>	2	
4. Major transients (1-2) <b>Event 7</b>	1	
5. EOPs entered/requiring substantive actions (1-2) <b>EOP-2, EOP-5</b>	2	
6. EOP contingencies requiring substantive actions (0-2) <b>EOP-2 Emergency Depressurization Leg</b>	1	
7. Critical tasks (2-3)	2	
<p><b>CRITICAL TASK DESCRIPTIONS:</b></p> <p><b>CT-1: Given the plant operating at power with an un-isolable primary system discharging into Secondary Containment, the crew will insert a manual Reactor scram, in accordance with EOP-5.</b></p> <p><b>CT-2: Given an un-isolable primary system discharging into Secondary Containment and two areas exceeding Maximum Safe Temperatures, the crew will perform an emergency RPV depressurization, in accordance with EOP-5.</b></p>		