ES-301 **Administrative Topics Outline** **Form ES-301-1**

Facility:	St. Lucie	Date of Examination:	3/18/19
Examination Level: RO ☒ SRO ☐		Operating Test Number:	L-19-1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R N	**A-1 R**: Calc Boron for withdrawal of dropped CEA
Conduct of Operations	R D	**A-2 R:** Calculate Time to Boil
Equipment Control	R N	**A-3 R:** Perform 2C ICW Quarterly Pump Code Run
Radiation Control	R D	**A-4 R:** Exposure limits, normal
Emergency Plan		

NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).

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

JPM Summary Description

A-1R: Calc Boron for withdrawal of dropped CEA

Task 2.1.25 RCO (3.9) Ability to interpret reference materials, such as graphs, curves, tables, etc

This is a new JPM. The applicant will be required to calculate the amount of boric acid required to withdraw a dropped CEA on Unit-1.

A-2R: Calculate Time to Boil

Task 2.1.37 RCO (4.3) Knowledge of procedures, guidelines, or limitations associated with reactivity management.

This is a Bank JPM. The applicant will determine the time to boil on Unit-1 following a loss of shutdown cooling.

A-3R: Perform 2C ICW Quarterly Pump Code Run

Task 2.2.12 RCO (3.7) Knowledge of surveillance procedures.

This is a new JPM. The applicant is required to know the power supply arrangement for the 2C ICW Pump Code Pump run and perform the data entry for the 2C Intake Cooling Water pump code run and evaluate the results, IAW 2-OSP-21.01C Attachment 2, and determine that the pump is in the ALERT status.

A-4R: Exposure limits, normal conditions

Task 2.3.7 RCO (3.5) Ability to comply with radiation work permit requirements during normal or abnormal conditions.

This is a Bank JPM. Given the dose records of four employees and radiation levels for specific job, the applicant will be required to determine the dose for a specific job and determine out of four employees which employee(s) would be allowed perform the job without a dose extension.

ES-301	Administrative Topics Outline	Form ES-301-1

Facility:	St. Lucie	Date of Examination:	3/18/19
Examination Level: RO ☐ SRO ☒		Operating Test Number:	L-19-1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R N	**A -1S:** Calculate Boron required for withdrawal of a dropped CEA & T.S.
Conduct of Operations	R D	**A -2S:** Calculate Time to Boil and T.S.
Equipment Control	R N	**A -3S:** Perform 2C ICW Quarterly Pump Code Run & operability determination.
Radiation Control	R N	**A -4S**: Gas Release Permit Review
Emergency Plan	R D	**A -5S:** EALS & Notification for a security event.

NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).

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

JPM Summary Description

A-1S: Calc Boron for withdrawal of dropped CEA & T.S.

Task 2.1.25 SRO (4.2) Ability to interpret reference materials, such as graphs, curves, tables, etc.

This is a new JPM. The applicant will be required to calculate the amount of boric acid required to withdrawal a dropped CEA on Unit-1 and determine Tech spec applicability.

A-2S: Calculate Time to Boil and T.S.

Task 2.1.37 SRO (4.6) Knowledge of procedures, guidelines, or limitations associated with reactivity management.

This is a Bank JPM. The applicant will determine the time to boil on Unit-1 following a loss of shutdown cooling and determine applicable Tech Specs

A-3S: Perform 2C ICW Quarterly Pump Code Run & T.S.

Task 2.2.37 SRO (4.6) Ability to determine operability and/or availability of safety related equipment.

This is a new JPM. The applicant is required to perform the data entry for the 2C Intake Cooling Water pump code run and evaluate the results, IAW 2-OSP-21.01C Attachment 2, and determine that the pump is in the ALERT status and evaluate pump Operability and TS applicability.

A-4S: Gas Release Permit Review

Task 2.3.4 SRO (3.7) Knowledge of radiation exposure limits under normal or emergency conditions.

This is a new JPM. The applicant will review a radioactive Gas release permit and determine if the permit is acceptable to perform the release.

A-5S: Determine Emergency Classification and Notification

Task 2.4.41 SRO (4.6) Knowledge of the emergency action level thresholds and classifications.

This is a Bank JPM. The applicant is required to evaluate given plant parameters to determine Emergency Classification and notification as necessary following a security event.

ES-301	Control Room/In-Plant Systems Outline	Form ES-301-2

Facility:	St. Lucie	Date of Examination:	3/18/19
Exam Level: RO ☐ SRO-I ☒ SRO-U ☐		Operating Test Number:	L-19-1

Control Room Systems:* 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U		
System/JPM Title	Type Code*	Safety Function
a. ALL (S-1) Emergency Borate using Alternate Path	A N L S	1
b. ALL (C-2) Bypass/Trip ESFAS Channel w/broken bypass switch	A N EN C	2
c. RO & SRO-I (S-3) Verify RAS w/ Failed actuation module	A D L S EN	3
d. RO & SRO-I (S-4) Restore AFW using 2C AFW after electric OS	M L S	4
e. RO & SRO-I (S-5) Operate hydrogen purge system U2	D L S	5
f. ALL (S-6) Restore Offsite Power to 2B3 4.16 KV bus	D S	6
g. RO & SRO-I (S-7) Respond to Hi rad alarm spent fuel U2	A M S	7
h. NOT SELECTED FOR SRO-I EXAM		
In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. ALL (P-1) RELEASE 1A WMST U1	D R	9
j. RO & SRO-I (P-2) Restore IA with the 2A IA compressor	N E	8
k. ALL (P-3) Align U2 CST to 1A AFW	P E D L	4

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all five SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for R /SRO-I/SRO-U
(A)lternate path	4–6/4–6 /2–3
(C)ontrol room	
(D)irect from bank	≤ 9/≤ 8/≤ 4
(E)mergency or abnormal in-plant	≥ 1/≥ 1/≥ 1
(EN)gineered safety feature	≥ 1/≥ 1/≥ 1 (control room system)
(L)ow-Power/Shutdown	≥ 1/≥ 1/≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2/≥ 2/≥ 1
(P)revious 2 exams	≤ 3/≤ 3/≤ 2 (randomly selected)
(R)CA	≥ 1/≥ 1/≥ 1
(S)imulator	

JPM SUMMARY

a: S-1 Emergency Boration using Alternate Path

004 A2.14 / Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Emergency boration (3.8/3.9)

This is a New / Alternate Path JPM; Unit 2 will be tripped with a LOOP. The applicant will be directed to perform the Operator immediate actions for 2-EOP-01, Standard Post Trip Actions. 3 CEAs fail to insert into the core. The applicant will initiate Emergency Boration using 2-AOP-02.02 Emergency Boration using the Hard Card. Upon starting either Boric Acid pump the 2A EDG will trip rendering both Boric Acid pumps OOS. The applicant will recognize the failure and implement the contingency steps to align the gravity feed valves to the charging pump suction. ALL applicants will perform this JPM.

b: C-2 RESPOND/BYPASS/TRIP A FAILED ESFAS CHANNEL

013 K1.09 Knowledge of the physical connections and/or cause effect relationships between the ESFAS and the following systems: CIRS 3.3/3.7

This is a New/Alternate Path JPM performed in the Unit 1 Control Room. Refueling Water Tank Level instrument LIS-07-2B will be failed high. The applicant will be directed to Bypass LIS-07-2B using 1-AOP-99.01 section 4.2.16 to meet the requirements of Tech Spec 3.3.2. When the applicant attempts to turn the bypass key it will not rotate, the applicant will then be required place the channel in trip. ALL applicants will perform this JPM.

c: S-3 Verify RAS w/ Failed actuation module

006 A3.08 \ Ability to monitor automatic operation of the ECCS, including: Automatic transfer of ECCS flowpaths (4.2 / 4.3)

This is a Direct from Bank /Alternate Path JPM; Unit-2 will be in 2-EOP-03 LOCA; The applicant will be directed to "Ensure RAS Actuation" per 2-EOP-03, LOSS OF COOLANT ACCIDENT, Section 4.0, Operator Actions, Step 39, Step B, C and D. During the evolution the applicant will identify failed RAS actuation and take action to manually actuate RAS Trains A and B, identify 2A LPSI Pp failure to stop and take action to manually stop 2A LPSI Pp. RO & SRO-I applicants will perform this JPM.

d: S-4 RESTORE AFW FLOW TO THE 2A AND 2B S/Gs USING 2C AFW PUMP

061 A2.04 / Ability to (a) predict the impacts of the following malfunctions or operations on the AFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: pump failure or improper operation (3.4/3.8)

This is a Modified Bank JPM; Unit 2 will be in Mode 3 NOP/NOT preparing for startup, valve SE-09-2 will have just closed on a loss of power. The NPO reports a high pitched noise coming from the 2B AFW pump motor, electrical maintenance has asked for the 2B AFW to be secured. The applicant will be directed to establish AFW to the 2A and 2B Steam Generators with the 2C AFW pump IAW 2-NOP-09.02 Auxiliary Feedwater step 4.3.6 and then secure the 2B AFW pump. When the applicant throttles either MV-09-11 or MV-09-12, the 2C AFW pump will trip on Electrical Overspeed. The applicant will enter 2-AOP-09.02 AUXILIARY FEEDWATER and take actions to start the 2C AFW pump and restore flow to the A&B S/Gs. RO & SRO-I applicants will perform this JPM.

e: S-5 OPERATE THE HYDROGEN PURGE SYSTEM - UNIT2

0028 A4.01/ Ability to manually operate and / or monitor in the control room: HRPS controls (4.0/4.0)

This is a Bank JPM; Unit 2 will have experienced a LOCA and will be implementing 2-EOP-03 LOCA. Containment Hydrogen is reported as being 4% and the Tech Support center has requested that the Hydrogen Purge system be placed in service. The applicant will place the Hydrogen Purge system in service IAW 2-EOP-99 app. N. RO & SRO-I applicants will perform this JPM.

f: S-6 RESTORE OFFSITE POWER TO 2B3 4.16 KV BUS

062 A4.07/ Ability to manually operate and/or monitor in the control room: Synchronizing and paralleling of different ac supplies (3.1/ 3.1)

This is a Direct from Bank JPM performed on Unit -2 simulator. Unit-2 will be at 0% power, following a Loss of Offsite Power. Both the 2A and 2B EDGs are supplying their respective busses. The applicant will restore the 2B3 bus from offsite IAW 2-EOP-99, Appendix D. ALL applicants will perform this JPM.

g: S-7 RESPOND TO HIGH RADIATION ALARM ON SPENT FUEL MONITORS U-2

072 K1.01/ Knowledge of the physical connections and/or cause-effect relationship between the ARM system and the following system: Plant ventilation systems (3.1/3.5)

This is a Modified /Alternate Path JPM; On Unit-2 simulator. Unit-2 will be 100% power, the Spent Fuel Area RAD Monitors are in High alarm, 2-AOP-26.02 is being implemented. The applicant will verify proper operation and line up of the Fuel Handling Building Ventilation and take action to correct any anomalies. RO & SRO-I applicants will perform this JPM.

i: P-1 RELEASE 1A WASTE MONITOR TANK

068-K4.01 / Knowledge of design feature(s) and/or interlock(s)
which provide for the following: Safety and environmental precautions for handling hot, acidic, and radioactive liquids (3.4/4.1)

This is a Bank JPM;
The 1A Waste Monitor Tank level is 81%, the Unit Supervisor will direct the applicant to place the 1A WMT on recirc, and then release its contents using the 1A Waste Monitor Pump, IAW section 4.2 of 1-NOP-06.01, Controlled Liquid Release to the Circulating Water Discharge. They will begin with 1-NOP-06.15, Oxygen Waste System, Oxygenated Waste System Step 4.4.1.2. ALL applicants will perform this JPM.

j: P-2 RESTORE INSTRUMENT AIR USING THE 2A IA COMPRESSOR

078-K4.02 / Knowledge of IAS design feature(s) and/or interlock(s) which provide for the following: Cross-over to other air systems (3.2/3.5)

This is a NEW JPM;
Unit 2 will have had a LOOP, the applicant will be directed to align and start the 2A Instrument Air Compressor.

RO & SRO-I applicants will perform this JPM.

k: P-3 ALIGN UNIT 2 CST TO SUPPLY 1A AFW PUMP

061A1.03 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the AFW controls including: Interactions when multi-unit systems are cross tied (3.1/3.6)

This is a Bank JPM;
The Unit 1 CST will be unavailable due to being damaged from a vertical tornado missile. The Unit 2 CST will be available. The Unit 1 Unit Supervisor will direct the applicant to line up the Unit 2 CST to supply the 1A AFW Pump IAW 1-AOP-09.02, Auxiliary Feedwater, Attachment 5
ALL applicants will perform this JPM.

ES-301	Control Room/In-Plant Systems Outline	Form ES-301-2

Facility:	St. Lucie	Date of Examination:	3/18/19
Exam Level: RO ☒ SRO-I ☐ SRO-U ☐		Operating Test Number:	L-19-1

Control Room Systems:* 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U		
System/JPM Title	Type Code*	Safety Function
a. ALL (S-1) Emergency Borate using Alternate Path	A N L S	1
b. ALL (C-2) Bypass/Trip ESFAS Channel w/broken bypass switch	A N EN C	2
c. RO & SRO-I (S-3) Verify RAS w/ Failed actuation module	A D L EN S	3
d. RO & SRO-I (S-4) Restore AFW using 2C AFW after electric OS	M L S	4
e. RO & SRO-I (S-5) Operate hydrogen purge system U2	D L S	5
f. ALL (S-6) Restore Offsite Power to 2B3 4.16 KV bus	D S	6
g. RO & SRO-I (S-7) Respond to Hi rad alarm spent fuel U2	A M S	7
h. RO ONLY (S-8) Align 2C CCW pp to the 'B' CCW HDR U2	D S	8
In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. ALL (P-1) RELEASE 1A WMST U1	D R	9
j. RO & SRO-I (P-2) Restore IA with the 2A IA compressor	N E	8
k. ALL (P-3) Align U2 CST to 1A AFW	P E D L	4

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all five SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for R /SRO-I/SRO-U
(A)lternate path	4–6/4–6 /2–3
(C)ontrol room	
(D)irect from bank	≤ 9/≤ 8/≤ 4
(E)mergency or abnormal in-plant	≥ 1/≥ 1/≥ 1
(EN)gineered safety feature	≥ 1/≥ 1/≥ 1 (control room system)
(L)ow-Power/Shutdown	≥ 1/≥ 1/≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2/≥ 2/≥ 1
(P)revious 2 exams	≤ 3/≤ 3/≤ 2 (randomly selected)
(R)CA	≥ 1/≥ 1/≥ 1
(S)imulator	

JPM SUMMARY

a: S-1 Emergency Boration using Alternate Path

004 A2.14 / Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Emergency boration (3.8/3.9)

This is a New / Alternate Path JPM; Unit 2 will be tripped with a LOOP. The applicant will be directed to perform the Operator immediate actions for 2-EOP-01, Standard Post Trip Actions. 3 CEAs fail to insert into the core. The applicant will initiate Emergency Boration using 2-AOP-02.02 Emergency Boration using the Hard Card. Upon starting either Boric Acid pump the 2A EDG will trip rendering both Boric Acid pumps OOS. The applicant will recognize the failure and implement the contingency steps to align the gravity feed valves to the charging pump suction. ALL applicants will perform this JPM.

b: C-2 RESPOND/BYPASS/TRIP A FAILED ESFAS CHANNEL

013 K1.09 Knowledge of the physical connections and/or cause effect relationships between the ESFAS and the following systems: CIRS 3.3/3.7

This is a New/Alternate Path JPM performed in the Unit 1 Control Room. Refueling Water Tank Level instrument LIS-07-2B will be failed high. The applicant will be directed to Bypass LIS-07-2B using 1-AOP-99.01 section 4.2.16 to meet the requirements of Tech Spec 3.3.2. When the applicant attempts to turn the bypass key it will not rotate, the applicant will then be required place the channel in trip. ALL applicants will perform this JPM.

c: S-3 Verify RAS w/ Failed actuation module

006 A3.08 \ Ability to monitor automatic operation of the ECCS, including: Automatic transfer of ECCS flowpaths (4.2 / 4.3)

This is a Direct from Bank /Alternate Path JPM; Unit-2 will be in 2-EOP-03 LOCA; The applicant will be directed to "Ensure RAS Actuation" per 2-EOP-03, LOSS OF COOLANT ACCIDENT, Section 4.0, Operator Actions, Step 39, Step B, C and D. During the evolution the applicant will identify failed RAS actuation and take action to manually actuate RAS Trains A and B, identify 2A LPSI Pp failure to stop and take action to manually stop 2A LPSI Pp. RO & SRO-I applicants will perform this JPM.

d: S-4 RESTORE AFW FLOW TO THE 2A AND 2B S/Gs USING 2C AFW PUMP

061 A2.04 / Ability to (a) predict the impacts of the following malfunctions or operations on the AFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: pump failure or improper operation (3.4/3.8)

This is a Modified Bank JPM; Unit 2 will be in Mode 3 NOP/NOT preparing for startup, valve SE-09-2 will have just closed on a loss of power. The NPO reports a high pitched noise coming from the 2B AFW pump motor, electrical maintenance has asked for the 2B AFW to be secured. The applicant will be directed to establish AFW to the 2A and 2B Steam Generators with the 2C AFW pump IAW 2-NOP-09.02 Auxiliary Feedwater step 4.3.6 and then secure the 2B AFW pump. When the applicant throttles either MV-09-11 or MV-09-12, the 2C AFW pump will trip on Electrical Overspeed. The applicant will enter 2-AOP-09.02 AUXILIARY FEEDWATER and take actions to start the 2C AFW pump and restore flow to the A&B S/Gs. RO & SRO-I applicants will perform this JPM.

e: S-5 OPERATE THE HYDROGEN PURGE SYSTEM - UNIT2

0028 A4.01/ Ability to manually operate and / or monitor in the control room: HRPS controls (4.0/4.0)

This is a Bank JPM; Unit 2 will have experienced a LOCA and will be implementing 2-EOP-03 LOCA. Containment Hydrogen is reported as being 4% and the Tech Support center has requested that the Hydrogen Purge system be placed in service. The applicant will place the Hydrogen Purge system in service IAW 2-EOP-99 app. N. RO & SRO-I applicants will perform this JPM.

f: S-6 RESTORE OFFSITE POWER TO 2B3 4.16 KV BUS

062 A4.07/ Ability to manually operate and/or monitor in the control room: Synchronizing and paralleling of different ac supplies (3.1/ 3.1)

This is a Direct from Bank JPM performed on Unit -2 simulator. Unit-2 will be at 0% power, following a Loss of Offsite Power. Both the 2A and 2B EDGs are supplying their respective busses. The applicant will restore the 2B3 bus from offsite IAW 2-EOP-99, Appendix D. ALL applicants will perform this JPM.

g: S-7 RESPOND TO HIGH RADIATION ALARM ON SPENT FUEL MONITORS U-2

072 K1.01/ Knowledge of the physical connections and/or cause-effect relationship between the ARM system and the following system: Plant ventilation systems (3.1/3.5)

This is a Modified /Alternate Path JPM; On Unit-2 simulator. Unit-2 will be 100% power, the Spent Fuel Area RAD Monitors are in High alarm, 2-AOP-26.02 is being implemented. The applicant will verify proper operation and line up of the Fuel Handling Building Ventilation and take action to correct any anomalies. RO & SRO-I applicants will perform this JPM.

h: S-8 ALIGN 2C CCW PUMP TO SUPPLY THE B CCW HEADER-UNIT-2

008 A2.01 / Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of CCW pump (3.3/3.6)

This is a Bank JPM; Unit 2 simulator. Unit-2 will be 100% power, the 2B CCW will have tripped. The applicant will start the 2C CCW pump on the 2B header IAW 2-AOP-14.01 Component Cooling Water Abnormal Operation. RO applicants will perform this JPM.

i: P-1 RELEASE 1A WASTE MONITOR TANK

068-K4.01 / Knowledge of design feature(s) and/or interlock(s)
which provide for the following: Safety and environmental precautions for handling hot, acidic, and radioactive liquids (3.4/4.1)

This is a Bank JPM;
The 1A Waste Monitor Tank level is 81%, the Unit Supervisor will direct the applicant to place the 1A WMT on recirc, and then release its contents using the 1A Waste Monitor Pump, IAW section 4.2 of 1-NOP-06.01, Controlled Liquid Release to the Circulating Water Discharge. They will begin with 1-NOP-06.15, Oxygen Waste System, Oxygenated Waste System Step

4.4.1.2. ALL applicants will perform this JPM.

j: P-2 RESTORE INSTRUMENT AIR USING THE 2A IA COMPRESSOR

078-K4.02 / Knowledge of IAS design feature(s) and/or interlock(s) which provide for the following: Cross-over to other air systems (3.2/3.5)

This is a NEW JPM;
Unit 2 will have had a LOOP, the applicant will be directed to align and start the 2A Instrument Air Compressor.

RO & SRO-I applicants will perform this JPM.

k: P-3 ALIGN UNIT 2 CST TO SUPPLY 1A AFW PUMP

061A1.03 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the AFW controls including: Interactions when multi-unit systems are cross tied (3.1/3.6)

This is a Bank JPM;
The Unit 1 CST will be unavailable due to being damaged from a vertical tornado missile. The Unit 2 CST will be available. The Unit 1 Unit Supervisor will direct the applicant to line up the Unit 2 CST to supply the 1A AFW Pump IAW 1-AOP-09.02, Auxiliary Feedwater, Attachment 5
ALL applicants will perform this JPM.

ES-301	Control Room/In-Plant Systems Outline	Form ES-301-2

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Exam Level: RO ☐ SRO-I ☐ SRO-U ☒		Operating Test Number:	L-19-1

Control Room Systems:* 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U		
System/JPM Title	Type Code*	Safety Function
a. ALL (S-1) Emergency Borate using Alternate Path	A N L S	1
b. ALL (C-2) Bypass/Trip ESFAS Channel w/broken bypass switch	A N EN C	2
c. NOT SELECTED FOR SRO-U EXAM		
d. NOT SELECTED FOR SRO-U EXAM		
e. NOT SELECTED FOR SRO-U EXAM		
f. ALL (S-6) Restore Offsite Power to 2B3 4.16 KV bus	D S	6
g. NOT SELECTED FOR SRO-U EXAM		
h. NOT SELECTED FOR SRO-U EXAM		
In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. ALL (P-1) RELEASE 1A WMST U1	D R	9
j. NOT SELECTED FOR SRO-U EXAM		
k. ALL (P-3) Align U2 CST to 1A AFW	P E D L	4

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all five SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for R /SRO-I/SRO-U
(A)lternate path	4–6/4–6 /2–3
(C)ontrol room	
(D)irect from bank	≤ 9/≤ 8/≤ 4
(E)mergency or abnormal in-plant	≥ 1/≥ 1/≥ 1
(EN)gineered safety feature	≥ 1/≥ 1/≥ 1 (control room system)
(L)ow-Power/Shutdown	≥ 1/≥ 1/≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2/≥ 2/≥ 1
(P)revious 2 exams	≤ 3/≤ 3/≤ 2 (randomly selected)
(R)CA	≥ 1/≥ 1/≥ 1
(S)imulator	

JPM SUMMARY

a: S-1 Emergency Boration using Alternate Path

004 A2.14 / Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Emergency boration (3.8/3.9)

This is a New / Alternate Path JPM; Unit 2 will be tripped with a LOOP. The applicant will be directed to perform the Operator immediate actions for 2-EOP-01, Standard Post Trip Actions. 3 CEAs fail to insert into the core. The applicant will initiate Emergency Boration using 2-AOP-02.02 Emergency Boration using the Hard Card. Upon starting either Boric Acid pump the 2A EDG will trip rendering both Boric Acid pumps OOS. The applicant will recognize the failure and implement the contingency steps to align the gravity feed valves to the charging pump suction. ALL applicants will perform this JPM.

b: C-2 RESPOND/BYPASS/TRIP A FAILED ESFAS CHANNEL

013 K1.09 Knowledge of the physical connections and/or cause effect relationships between the ESFAS and the following systems: CIRS 3.3/3.7

This is a New/Alternate Path JPM performed in the Unit 1 Control Room. Refueling Water Tank Level instrument LIS-07-2B will be failed high. The applicant will be directed to Bypass LIS-07-2B using 1-AOP-99.01 section 4.2.16 to meet the requirements of Tech Spec 3.3.2. When the applicant attempts to turn the bypass key it will not rotate, the applicant will then be required place the channel in trip. ALL applicants will perform this JPM.

f: S-6 RESTORE OFFSITE POWER TO 2B3 4.16 KV BUS

062 A4.07/ Ability to manually operate and/or monitor in the control room: Synchronizing and paralleling of different ac supplies (3.1/ 3.1)

This is a Direct from Bank JPM performed on Unit -2 simulator. Unit-2 will be at 0% power, following a Loss of Offsite Power. Both the 2A and 2B EDGs are supplying their respective busses. The applicant will restore the 2B3 bus from offsite IAW 2-EOP-99, Appendix D. ALL applicants will perform this JPM.

i: P-1 RELEASE 1A WASTE MONITOR TANK

068-K4.01 / Knowledge of design feature(s) and/or interlock(s) which provide for the following: Safety and environmental precautions for handling hot, acidic, and radioactive liquids (3.4/4.1)

This is a Bank JPM;
The 1A Waste Monitor Tank level is 81%, the Unit Supervisor will direct the applicant to place the 1A WMT on recirc, and then release its contents using the 1A Waste Monitor Pump, IAW section 4.2 of 1-NOP-06.01, Controlled Liquid Release to the Circulating Water Discharge. They will begin with 1-NOP-06.15, Oxygen Waste System, Oxygenated Waste System Step 4.4.1.2. ALL applicants will perform this JPM.

k: P-3 ALIGN UNIT 2 CST TO SUPPLY 1A AFW PUMP

061A1.03 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the AFW controls including: Interactions when multi-unit systems are cross tied (3.1/3.6)

This is a Bank JPM;
The Unit 1 CST will be unavailable due to being damaged from a vertical tornado missile. The Unit 2 CST will be available. The Unit 1 Unit Supervisor will direct the applicant to line up the Unit 2 CST to supply the 1A AFW Pump IAW 1-AOP-09.02, Auxiliary Feedwater, Attachment 5
ALL applicants will perform this JPM.

Facility: St Lucie												Exam Date: 3/18/2019	
Admin JPMs	1 ADMIN Topic and K/A	2 LOD (1-5)	3 Attributes: I/C Focus	Cues	Critical Steps	Scope (N/B)	Overlap	Perf. Std.	Key	4 Job Content: Minutia	Job Link	5 U/E/S	6 Explanation
L-19-1 NRC JPM A-1 RO	2.1.25	2										S	The task standard and what is asked on the cue are different. The standard says it is over when the applicant calculates the amount of boric acid required and the cue asks for the boric acid rate for a 10 min recovery. The standard should give the task to calculate the total boric acid required to recover the worst-case rod for a ten min recovery including the injection rate required, Only at the end of the JPM do you allow for a range of values to be considered acceptable to meet the critical steps. Should there also be a range for the individual critical steps? Task Standard: remove total "B" to be added and put the rate# and band in standard. Corrected
L-19-1 NRC JPM A-2 RO	2.1.37	2										S	Since there is no interpolation in obtaining the values do you really need such a large band drop it down to just rounding errors to 2 significant digits? Task Standard: needs to include the value range that is acceptable for time to boil. The given information should be under initial conditions Remove from initial conditions the date and time Include something to the effect that core offload has not yet commenced Step 10 put what the * means in an examiner note. Remove the time it boils from the answer key and requested information only need the time to boil (13.34 min) or the time that boiling occurs Corrected
L-19-1 NRC JPM A-3 RO	2.2.12	2										S	Task Standard is not worded correctly. "evaluate status and determine if pump status" Change the UMA value to .4329 so that it is in the required action range this will test the K/A better as you will have one parameter in the alert range and one in the required action range and the applicant will need to determine what the correct response to step two of attachment 2 is. Cue sheet change vibration data to make one in the alert range. Fix the missing letter from cue Include in initial conditions 2C ICW pump is aligned and operating on the 2C header per 2 NOP-21.203c, 2A ICW pump is aligned and operating on the 2A header, 2B ICW is in pull to lock per NOP 21-203C Validation time 15 min Corrected

L-19-1 NRC JPM A-4 RO	2.3.7	2										S	Initial Conditions: Change field from 2700 to 1000 mr/hr Ask the following: What would the total does be for each individual? Which if any individual can perform the task without a dose extension? 1. 2800 No 2. 2720 No 3. 2750 No 4. 2200 No Corrected
L-19-1 NRC JPM A-1S	2.1.25	2							X			S	**UnSat** The task standard and what is asked on the cue are different. The standard says it is over when the applicant calculates the amount of boric acid required and the cue asks for the boric acid rate for a 10 min recovery. The standard should give the task to calculate the total boric acid required to recover the worst-case rod for a ten min recovery including the injection rate required, only at the end of the JPM do you allow for a range of values to be considered acceptable to meet the critical steps. Should there also be a range for the individual critical steps? In addition, please include what the written description for TS 3.1.3.1 condition e is makes grading much easier. Is not TS. 3.1.3.5 also applicable as you have a shutdown CEA not withdrawn to 129 inches? Need to make it critical that either in the task standard or the final step that non applicable ts identified will be graded a missed critical step. Task Standard: remove total "B" to be added and put the rate# and band in standard. Add the TS required and no others in standard 3.1.3.1 condition e and 3.1.3.5 if facility determines that this is the correct specs. Put the names of the TS in the cue Corrected
L-19-1 NRC JPM A-2 SRO	2.1.37	2										S	Since there is no interpolation in obtaining the values do you really need such a large band drop it down to just rounding errors to 2 significant digits. Need to make it critical that either in the task standard or the final step that non-applicable Tech Specs identified will be graded a missed critical step. Task Standard: needs to include the value range that is acceptable for time to boil. Need the applicable TS and condition and no others in standard The given information should be under initial conditions Remove from initial conditions the date and time Include something to the effect that core offload has not yet commenced Step 10 put what the * means in an examiner note. Remove the time it boils from the answer key and requested information only need the time to boil (13.34 min) Corrected
L-19-1 NRC JPM A-3 SRO	2.2.37	2										S	Do you need to provide the ADM procedure? Part of the evaluation of the SRO is that they know where to look for things without being told. The handout package cannot just be the pages of the ADM that are applicable. I believe that reference needs to be requested by the applicant or be available via search on a computer. Cue sheet change vibration data to make one in the alert range Fix the missing letter from cue

													Include in initial conditions 2C ICW pump is aligned and operating on the 2C header per 2 NOP-21.203c, 2A ICW pump is aligned and operating on the 2A header, 2B ICW is in pull to lock per NOP 21-203C Validation time 15 min Corrected
L-19-1 NRC JPM A-4 SRO	2.3.4	2										S	Initial Conditions: request that a Main Containment Purge be initiated IAW 2 NOP-06.02 Initiating cue add explain ALL REASONS for approval/Disapproval for this release. Task Standard: Modify to include the list of errors (2) Corrected
L-19-1 NRC JPM A-5 SRO	2.4.44	2										S	Initial Conditions: should be above the cue for consistency Replace the protected area with the roof of the South Service building Remove you are tasked with classifying the event and fil out the form 2nd bullet form after time critical Fill out the Florida Nuclear form through step 15 Add on the initial conditions Unit 1 and 2 have been manually tripped. Corrected
Simulator/In-Plant JPMs	1 Safety Function and K/A												
A L-19-1 NRC JPM S-1 (all)	1 004-A2.14	2										S	Will simulator be tripped when it comes out of freeze or will it trip right after? Cue on step 8 need to see how this runs but I think that it would be more appropriate to state that the BOP is addressing the EDG and let it go at that. Step 15 says that V2514 would not open I don't see that anywhere in the JPM. I believe that it should reference no power to the Pumps. Do not auto acknowledge alarms Put note for examiner that charging flow will need to be verified using the computer screen Corrected
B L-19-1 NRC JPM C-2 (all)	2 013-K1.09	2										S	Note to evaluator to only give page 33 first then give the attachment after the switch fails Missing pages of attachment 9 Corrected
C L-19-1 NRC JPM S-3 (RO/SROI)	3 013-A2.01	2										U S	**UNSAT** Task Standard: include the 4 critical steps in the standard Cue sheet: 2EOP-3 put the noun name the first place it is references. Removed from exam as the procedural path is not clear This is under pressure control for safety function Turn over: Monitor for RAS and ensure proper actuation Note for Evaluator: Simulator to be placed in run ONLY when ready to begin the task Step 8 remove repetitive steps Corrected
D L-19-1 NRC JPM S-4 (RO/SROI)	4 061-A2.04	2										E.	Ensure the JPM is pre-briefed Task Standard: add with the 2C AFW pump Initial Conditions: Move NPO is stationed at the 2C AFW pump to the initial conditions

													Modify initial conditions to “Unit 2 is in mode 3 NOP/NOT preparing for startup. The A & B AFW pumps were/are suppling their respective S/G’s when a loss of power to SE-09-02 occurred closing the valve. In addition the NPO reports….” Remove “and then secure the 2B AFW pump” another operator will secure the 2B AFW pump when the C AFW pump is suppling Ensure that the procedure that is handed to applicant is marked up and properly place kept Performance step 6 DO not have the cue give AOP attachment 1 to the applicant – instead have the US directs you to restore AFW flow to the A/B S/G with the C AFW pump. Step 18: make only opening 1 steam supply valve critical. Note for facility “why does the 1st start of the C AFW pump not say simutanisouly like the second start? Is this a procedure error? Step 14: add evaluator cue for time compression Step 16/17: make sure that one or both of these valves (verify close of throttled) Step 22/23 get rid of the 150 gpm as critical Validation time 20 min. Corrected
E L-19-1 NRC JPM S-5 (RO/SROI)	5 028- A4.01	2										S	Task Standard: 2 EOP-99 appendix N, not 2AOP 26.02 with hydrogen purge flow established using the B train components only. Step 9 Remove the 100 cfm form critical step standard Step 3, note to examiner that key is required Step 5, critical step is that valve is throttled 5 to 25% open Handout should be single sided Validation time is 15 min Corrected
F L-19-1 NRC JPM S-6 (all)	6 062- K1.04	2										S	**UNSAT** Original JPM removed from exam due to level of difficulty Task Standard: Bus is powered from off-site with EDG breaker open, diesel generator secured with no lockout present Initial conditions: add and then stop diesel Make sure that breaker is open and green flogged per table 6 Step 7 not critical Step 10, step standard should be Adjust EDG governor to prevent reverse power trip (should load to ~ 100KW) Step 11, critical portion of step is to open the breaker Step 14 is critical On simulator setup make sure sync switch is stored in correct location not on the control board Corrected
G L-19-1 NRC JPM S-7 (RO/SROI)	7 072- K1.01	2										S	Back up snap so that the alarms have not yet occurred. (preserves alternate path) Add D-33 not closing (critical step to state that the fuse needs to be removed. Modify cue sheet to 100% power no tell JPM Delay the stack alarms so applicant go to the correct procedure. Include the ARP May go down the path of the AOP for fuel accident. This is OK as it will still get to the procedure that is desired.

													Insert cue for the examiner that another operator will perform AOP-67 and directs you to perform AOP 26.02 Validation time 15 min. Corrected
H L-19-1 NRC JPM S-8 (RO)	8 008- A2.01											S	Performance step 4 has a typo should be 2C CCW nor 2CCW. Prior to performance step 15 ensure that the person dealing with alarms doesn't acknowledge alarms that the applicant is required to verify May have to not have an additional person to acknowledge alarms on this one. Initiating cue to add the section that they are required to perform. Task Standard: Aligned both electrically and mechanically per 2-AOP-14.01 with pump running. Step 13, make it clear that the applicant will position the breakers Validation time 15 min Corrected
P-1 (All)	7 068- K4.01	2										S	10 mins seems like a short period of time considering the number of steps in the JPM will check during validation. Additional comments as required after validation. Add to initial conditions that you have the SNPO keys Modify initial cue to break it out into two separate tasks make it clear. Step 1, Only critical if no in filling B when the JPM is administered. Step 3, Evaluator note that it is OK to open box Step 5, evaluator note "To raise pressure close the valve" Step 9, not critical Remove header before step 13 Stop JPM after step 25 Corrected
P-2 (RO/SROI)	8 078- K4.02	2										E	Clean up cue should load until 110 and reload at 106 Make sure that we have a picture of the touch screen for the air compressor as it will be "asleep" during the JPM Still need Picture
P-3 (ALL)	4 061- A1.03	2										S	Initial Conditions: add step 2.4.3 and remove vertical tornado missile Missing steps in the JPM that are N/A what happens if the applicant performs those steps? Determine cue for how examiner responds to applicant concerning caution prior to step 6. Corrected

Instructions for Completing This Table:

Check or mark any item(s) requiring a comment and explain the issue in the space provided using the guide below.

1. Check each JPM for appropriate administrative topic requirements (COO, EC, Rad, and EP) or safety function requirements and corresponding K/A. Mark in column 1. (ES-301, D.3 and D.4)

2. Determine the level of difficulty (LOD) using an established 1–5 rating scale. Levels 1 and 5 represent an inappropriate (low or high) discriminatory level for the license that is being tested. Mark in column 2 (Appendix D, C.1.f)

3. In column 3, "Attributes," check the appropriate box when an attribute is **not met**:
   - The initial conditions and/or initiating cue is clear to ensure the operator understands the task and how to begin. (Appendix C, B.4)
   - The JPM contains appropriate cues that clearly indicate when they should be provided to the examinee. Cues are objective and not leading. (Appendix C, D.1)
   - All critical steps (elements) are properly identified.
   - The scope of the task is not too narrow (N) or too broad (B).
   - Excessive overlap does not occur with other parts of the operating test or written examination. (ES-301, D.1.a, and ES-301, D.2.a)
   - The task performance standard clearly describes the expected outcome (i.e., end state). Each performance step identifies a standard for successful completion of the step.
   - A valid marked up key was provided (e.g., graph interpretation, initialed steps for handouts).

4. For column 4, "Job Content," check the appropriate box if the job content flaw **does not meet** the following elements:
   - Topics are linked to the job content (e.g., not a disguised task, task required in real job).
   - The JPM has meaningful performance requirements that will provide a legitimate basis for evaluating the applicant's understanding and ability to safely operate the plant. (ES-301, D.2.c)

5. Based on the reviewer's judgment, is the JPM as written (U)nacceptable (requiring repair or replacement), in need of (E)nhancement, or (S)atisfactory? Mark the answer in column 5.

6. In column 6, provide a brief description of any (U)nacceptable or (E)nhancement rating from column 5.

Save initial review comments and detail subsequent comment resolution so that each exam-bound JPM is marked by a (S)atisfactory resolution on this form.

Facility: St Lucie					Scenario: L-19-1 NRC EXAM Scenario 1				Exam Date: 3/18/2019
1 Event	2 Realism/Cred.	3 Required Actions	4 Verifiable actions	5 LOD	6 TS	7 CTs	8 Scen. Overlap	9 U/E/S	10 Explanation
									During turnover make sure marked up procedure and reactivity brief are available to the crew prior to walking into the simulator. The dilution rate that was given was seen by validation crew as too high not what you would see in the plant.
1								S	What power is necessary to achieve and not affect the rest of scenario? Would like to have a specific power level for consistency. How long to achieve 10-12%? Reactivity Sheet has rods at 120" at 1% power when actual simulator conditions are rods at 110" and 1% power. Include the hard card for RCS boration needs to be included in the D-2 (NOP 02-24, Boron concentration control Section 4.2) Odd alarm received for 2A FWP facility is investigating. Corrected
2					X	X		S	Can the applicants catch this malfunction prior to the DNB TS? BOP did all of the verifiable actions Add note that the crew may elect to secure dilution and reset variable power trip Corrected
3					X			S	Need to include in the D-2 the TS and applicable action and function if applicable not just the table. On page 14 of 55 indicate that the BOP bypasses the channel. TS.3.3.2 include action b in addition to the ones listed. Corrected
4							X	S	How does the instrument fail? Hi/Low/as is. Can poor performance result in loss of letdown? Are any action required pother than taking to manual/will adjustment need to be made to maintain the band? In section 4.2.7 add in the D-2 to restore L/D pressure to ~ 430 psig. Corrected
5					X			S	Do you expect then to perform the down power? If they do not do it how does it affect the ES 301-5? The BOP would have no verifiable actions. Add noun name to annunciator N-46 on the D-2 Section 4.2.1 where is says to start second charging pump it should say third or state that the second charging pump is already running Remove all of the references as to what you will do with the turbine it is not running and is not needed Add evaluator cue to after they secure the RCP then trigger the LOCA Corrected
6							X	S	Make sure that the page number that the information for PCV-1100F information on in the D-2 so that the evaluator can find it quickly. Page 34 add under inventory control add may isolate L/D and start additional charging pump Include AFW actions in the D-2 (taking it to hand) Corrected
7								S	
8						X		E	Critical task time tracking tool may be helpful Time start to track and time completed in the D-2 Place a pressure to time start (5.4 psig) and a place to track time to validate the CT completion. Corrected
								S	

Facility: St Lucie					Scenario: L-19-1 NRC EXAM Scenario 2 (Spare)				Exam Date: 3/18/2019
1 Event	2 Realism/Cred.	3 Required Actions	4 Verifiable actions	5 LOD	6 TS	7 CTs	8 Scen. Overlap	9 U/E/S	10 Explanation
									Turnover is incorrect already have two charging pumps running. Include the reactor engineering letter in the D-2 The procedure provided to the validation crew was missing pages. Corrected
1							X	S	The D-2 only has actions listed as for the SRO not broken down into the positions that will have the verifiable actions. Need to make determination when enough power rise is sufficient so we have consistency between crews (will do during validation) Normal dilution would not be in progress, consider adding steps to start dilutions in the D-2 Add hard card info for turbine loading on page 9. Info for divert hard card should also be in the D-2 Corrected
2					X			S	Fix the tech spec's 3.3.2 20a and 20b. facility rep to evaluate if 3.3.1 function 6 and 7 Page 13 has a typo it says that the SRO bypasses Channel C when it should be channel D Corrected
3					X			S	Would like to see the actions that the BOP and ATC operator take identified so that the 201-5 can be verified. Add annunciator noun name for T-12 Typo on page 17 ARP/AOP. Page 18 Make is clear that the BOP starts HVS-1B containment fan cooler. Include a SM cue that if the crew does not want to start HVS-1B to let them know that the temp is rising or something to that effect to compel them to starting the fan. Make HVS-1B running so the note in the procedure is not an issue. ON the D-1 event 3 states that action C and B on the applicable when the D-2 has only action B validate the TS and make it consistent throughout Corrected
4								S	Need the verifiable actions spelled out for the position that is getting credit. Corrected
5								S	Page 24 please add that isolation of L/D is possible under inventory control. Modifiy the scenario such that 2A FRV is capable of manipulation and feed can be recovered and S/G levels stabilized. This will now become a critical task to control S/G level prior to reactor trip. Once signal from evaluator or reactor trip move on to the fail the FRV at that point to get into the major. Page 28 Appendix J should not be there have note should not restore CCW because….. Corrected
6						X	X	S	What is the basis of CT prior to entering EOP-01. Corrected removed CT
7								S	What is the section to secure 2B1 RCP about Corrected cut and paste
8						X		S	
								S	

Facility: St Lucie					**Scenario: L-19-1 NRC EXAM Scenario 4**				**Exam Date: 3/18/2019**
1 Event	2 Realism/Cred.	3 Required Actions	4 Verifiable actions	5 LOD	6 TS	7 CTs	8 Scen. Overlap	9 U/E/S	10 Explanation
									Turnover: Last page 3.2.2 should be 3.1.2.2 and 3.2.4 should be 3.1.2.4 Corrected
1					X			S	Are there verifiable action required in the ARP? If so they need to be listed on the D-2 with the expected person that will accomplish. Again you have the SRO to direct but the BOP is doing the action in D-2 Page 10 under the TS please include function 8 and 7 respectively and the actions 2a and 20a. Also 3.3.2 action 20b is applicable same as issue identified in scenario 1 Corrected
2						X		S	Verifiable action is the ATC takes manual control not the SRO directing to do so. Add note that they may energize B/U heaters. Determine if acoustic monitor should have alarmed if it is supposed to have makes sure that it is fixed. Add annunciator H-16 to event with noun name. Corrected
3							X	S	
4					X			S	Need the action statement along with TS 3.4.5 in D-2. We need to discuss how much of the down-power we want to observe prior to the next event for consistency between crews Page 19 change rate from 10 min to 6 min to speed up scenario some. Page 21 Give BOP credit for leak rate Page 21 step 10 provide information to the examiners as to what the field actions are that are directed in attachment 7. Have cue after suitable time delay that attachment 7 is complete from the booth. Need to sequence steps numbers and the D-2's to match Corrected
5								S	Major only says the SRO if possible identify in the right hand column who is expected to do the verifiable action Should the CT be to energize and start the "C" charging pumps to meet step 8 page 37 include all of the valves that will be manipulated? There is nothing in the D-2 on if the steam supply from B S/G should be used for the C AFW pump. Page 36 when directed to perform appendix A put a step saying appendix A actions are listed on page XX Corrected
6						X		S	Can we have a time start and stop to be able to validate the CT Do not trigger event 7 until EOP-4 is entered remove examiner note auto trigger from page 37 Corrected
7								S	
8								S	
								S	

Facility: St Lucie					**Scenario: L-19-1 NRC EXAM Scenario 5**			**Exam Date: 3/18/2019**	
1 Event	2 Realism/Cred.	3 Required Actions	4 Verifiable actions	5 LOD	6 TS	7 CTs	8 Scen. Overlap	9 U/E/S	10 Explanation
									CT for HPI forced cooling needs a plant parameter to have it tied to not just to not it when required.(Prior to PORV opening) Corrected
1					X			S	Need the function affected from the tables in TS for grading. Add the applicants may elect to place let down in manual to restore level then return to auto. Add actions associated with attachment 5 to the D-2. Add the BOP for credit of attachment 5 (normal) to the D-1. Facility to verify that stby charging pump should have started on transient. Include the DNB TS if the crew drops below 2025 psig 3.2.5 and add function 3.3.3.6 TS Corrected
2						X		S	On CT if no action is taken how long before a trip would occur? Add if they are supposed to take the controller back to auto or not in D-2 Corrected
3					X			S	Add the step A/C selection Corrected
4								S	Left column needs the position that is expected to perform the verifiable action in addition to the SRO. Put evaluator note that controller TIC-2223 is reverse acting Corrected
5								S	Page 23 step 2, Typo is says rapid down power due to RCS leakage it should be due to loss of the HDP Note to examiner to watch down power until feed pump suction starts to rise then trigger next event at lead examiners discretion Corrected
6								S	Page 30 Step 10,l applicant action behavior is missing a word Corrected
7								S	Add the in/out RCP valve manipulations to page 35 Page 35, note that the steam generator sample valves are already closed. Corrected
8						X		S	
								S	

Instructions for Completing This Table:

Use this table for each scenario for evaluation.

2 Check this box if the events are not related (e.g., seismic event followed by a pipe rupture) **OR** if the events do not obey the laws of physics and thermodynamics.

3, 4 In columns 3 and 4, check the box if there is **no** verifiable or required action, as applicable. Examples of required actions are as follows: (ES-301, D.5f)

- opening, closing, and throttling valves
- starting and stopping equipment
- raising and lowering level, flow, and pressure
- making decisions and giving directions
- acknowledging or verifying key alarms and automatic actions (Uncomplicated events that require no operator action beyond this should **not** be included on the operating test unless they are necessary to set the stage for subsequent events. (Appendix D, B.3).)

5 Check this box if the level of difficulty is **not** appropriate.

6 Check this box if the event has a TS.

7 Check this box if the event has a critical task (CT). If the same CT covers more than one event, check the event where the CT started **only.**

8 Check this box if the event overlaps with another event on any of the last two NRC examinations. (Appendix D, C.1.f)

9 Based on the reviewer's judgment, is the event as written (U)nacceptable (requiring repair or replacement), in need of (E)nhancement, or (S)atisfactory? Mark the answer in column 9.

10 Record any explanations of the events here.

In the shaded boxes, sum the number of check marks in each column.

- In column 1, sum the number of events.
- In columns 2–4, record the total number of check marks for each column.
- In column 5, based on the reviewer's judgement, place a checkmark only if the scenario's LOD is not appropriate.
- In column 6, TS are required to be ≥ 2 for each scenario. (ES-301, D.5.d)
- In column 7, preidentified CTs should be ≥ 2 for each scenario. (Appendix D; ES-301, D.5.d; ES-301-4)
- In column 8, record the number of events not used on the two previous NRC initial licensing exams. A scenario is considered unsatisfactory if there is < 2 new events. (ES-301, D.5.b; Appendix D, C.1.f)
- In column 9, record whether the scenario as written (U)nacceptable, in need of (E)nhancement, or (S)atisfactory from column 11 of the simulator scenario table.

Facility:							Exam Date:		
Scenario	1 Event Totals	2 Events Unsat.	3 TS Total	4 TS Unsat.	5 CT Total	6 CT Unsat.	7 % Unsat. Scenario Elements	8 U/E/S	11 Explanation
1	8	0	3	0	2	0	0	S	All Corrections have been implemented
2	8	0	2	0	2	0	0	S	All Corrections have been implemented
4	8	0	2	0	2	0	0	S	All Corrections have been implemented
5	8	0	2	0	2	0	0	S	All Corrections have been implemented

Instructions for Completing This Table:

Check or mark any item(s) requiring comment and explain the issue in the space provided.

1, 3, 5 For each simulator scenario, enter the **total** number of events (column 1), TS entries/actions (column 3), and CTs (column 5). This number should match the respective scenario from the event-based scenario tables (the sum from columns 1, 6, and 7, respectively).

2, 4, 6 For each simulator scenario, evaluate each event, TS, and CT as (S)atisfactory, (E)nhance, or (U)nsatisfactory based on the following criteria:

a. Events. Each event is described on a Form ES-D-2, including all switch manipulations, pertinent alarms, and verifiable actions. Event actions are balanced between at-the-controls and balance-of-plant applicants during the scenario. All event-related attributes on Form ES-301-4 are met. Enter the total number of unsatisfactory events in column 2.

b. TS. A scenario includes at least two TS entries/actions across at least two different events. TS entries and actions are detailed on Form ES-D-2. Enter the total number of unsatisfactory TS entries/actions in column 4. (ES-301, D.5d)

c. CT. Check that a scenario includes at least two preidentified CTs. This criterion is a target quantitative attribute, not an absolute minimum requirement. Check that each CT is explicitly bounded on Form ES-D-2 with measurable performance standards (see Appendix D). Enter the total number of unsatisfactory CTs in column 6.

7 In column 7, calculate the percentage of unsatisfactory scenario elements: $\left(\frac{2+4+6}{1+3+5}\right)100\%$

8 If the value in column 7 is > 20%, mark the scenario as (U)nsatisfactory in column 8. If column 7 is ≤ 20%, annotate with (E)nhancement or (S)atisfactory.

9 In column 9, explain each unsatisfactory event, TS, and CT. Editorial comments can also be added here.

Save initial review comments and detail subsequent comment resolution so that each exam-bound scenario is marked by a (S)atisfactory resolution on this form.

Site name:			Exam Date:			
OPERATING TEST TOTALS						
	Total	Total Unsat.	Total Edits	Total Sat.	% Unsat.	Explanation
Admin. JPMs	9	0	9	9	0	
Sim./In-Plant JPMs	11	3	8	11	27	
Scenarios	4	0	4	4	0	
Op. Test Totals:	24	3	21	24	12.5%	All comments have been implemented and are now sat

Instructions for Completing This Table:

Update data for this table from quality reviews and totals in the previous tables and then calculate the percentage of total items that are unsatisfactory and give an explanation in the space provided.

1. Enter the total number of items submitted for the operating test in the “Total” column. For example, if nine administrative JPMs were submitted, enter “9” in the “Total” items column for administrative JPMs. For scenarios, enter the total number of simulator scenarios.

2. Enter the total number of (U)nsatisfactory JPMs and scenarios from the two JPMs column 5 and simulator scenarios column 8 in the previous tables. Provide an explanation in the space provided.

3. Enter totals for (E)nhancements needed and (S)atisfactory JPMs and scenarios from the previous tables. This task is for tracking only.

4. Total each column and enter the amounts in the “Op. Test Totals” row.

5. Calculate the percentage of the operating test that is (U)nsatisfactory (Op. Test Total Unsat.)/(Op. Test Total) and place this value in the bolded “% Unsat.” cell.

   Refer to ES-501, E.3.a, to rate the overall operating test as follows:
   - satisfactory, if the “Op. Test Total” “% Unsat.” is ≤ 20%
   - unsatisfactory, if “Op. Test Total” “% Unsat.” is > 20%

6. Update this table and the tables above with post-exam changes if the “as-administered” operating test required content changes, including the following:
   - The JPM performance standards were incorrect.
   - The administrative JPM tasks/keys were incorrect.
   - CTs were incorrect in the scenarios (not including postscenario critical tasks defined in Appendix D).
   - The EOP strategy was incorrect in a scenario(s).
   - TS entries/actions were determined to be incorrect in a scenario(s).

Facility: St Lucie RO Exam Date of Exam: March 2019

Tier	Group	RO K/A Category Points												SRO-Only Points						
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2		G*		Total		
1. Emergency and Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A		3	18					6		
	2	2	2	2				1	1			1	9					4		
	Tier Totals	5	5	5				4	4			4	27					10		
2. Plant Systems	1	2	3	2	3	2	3	2	3	3	3	2	28					5		
	2	1	1	1	1	1	1	1	1	1	0	1	10					3		
	Tier Totals	3	4	3	4	3	4	3	4	4	3	3	38					8		
3. Generic Knowledge and Abilities Categories		1			2			3			4		10	1	2	3	4	7		
		3			3			1			3									

Note:
1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outline sections (i.e., except for one category in Tier 3 of the SRO-only section, the "Tier Totals" in each K/A category shall not be less than two). (One Tier 3 radiation control K/A is allowed if it is replaced by a K/A from another Tier 3 category.)
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points, and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the 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.
4. Select topics from as many systems and evolutions as possible. Sample every system or evolution in the group before selecting a second topic for any system or evolution.
5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
7. The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' 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.
9. For Tier 3, select topics from Section 2 of the K/A catalog and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

G* Generic K/As

* These systems/evolutions must be included as part of the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan. They are not required to be included when using earlier revisions of the K/A catalog.

** These systems/evolutions may be eliminated from the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan.

ES-401	PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions—Tier 1/Group 1 (RO/SRO)									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#
000007 (EPE 7; BW E02&E10; CE E02) Reactor Trip, Stabilization, Recovery / 1	X						Knowledge of the operational implications of the following concepts as they apply to the (Reactor Trip Recovery) EK 1.1: Components, capacity, and function of emergency systems	2.9	16
000008 (APE 8) Pressurizer Vapor Space Accident / 3					X		Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: AA 2.17: Steam dump valve controller (position)	2.5	1
000009 (EPE 9) Small Break LOCA / 3				X			Ability to operate and monitor the following as they apply to a small break LOCA: EA 1.17: PRT	3.4	2
000011 (EPE 11) Large Break LOCA / 3			X				Knowledge of the reasons for the following responses as the apply to the Large Break LOCA: EK 3.13: Hot-leg injection/recirculation	3.8	3
000015 (APE 15) Reactor Coolant Pump Malfunctions / 4			X				Knowledge of the reasons for the following responses as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow) : AK 3.03: Sequence of events for manually tripping reactor and RCP as a result of an RCP malfunction	3.7	4
000022 (APE 22) Loss of Reactor Coolant Makeup / 2			X				Knowledge of the reasons for the following responses as they apply to the Loss of Reactor Coolant Makeup: AK3.02: Actions contained in SOPs and EOPs for RCPs, loss of makeup, loss of charging, and abnormal charging	3.5	5
000025 (APE 25) Loss of Residual Heat Removal System / 4					X		Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: AA2.02: Leakage of reactor coolant from RHR into closed cooling water system or into the reactor building atmosphere	3.2	6
000026 (APE 26) Loss of Component Cooling Water / 8						X	Loss of Component Cooling Water (CCW) G 2.4.50: Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	4.2	7
000027 (APE 27) Pressurizer Pressure Control System Malfunction / 3		X					Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: AK 2.03: Controllers and positioners	2.6	8
000029 (EPE 29) Anticipated Transient Without Scram / 1		X					Knowledge of the interrelations between the and the following an ATWS: EK 2.06: Breakers, relays, and disconnects	2.9	9
000038 (EPE 38) Steam Generator Tube Rupture / 3				X			Ability to operate and monitor the following as they apply to a SGTR: EA 1.36: Cooldown of the RCS to a specified Temperature	2.5	10

ES-401	PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions—Tier 1/Group 1 (RO/SRO)									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#
000040 (APE 40; BW E05; CE E05; W E12) Steam Line Rupture—Excessive Heat Transfer / 4		X					Knowledge of the interrelations between the (Excess Steam Demand) and the following: EK 2.1: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.3	17
000054 (APE 54; CE E06) Loss of Main Feedwater /4	X						Knowledge of the operational implications of the following concepts as they apply to the (Loss of Feedwater) EK 1.3: Annunciators and conditions indicating signals, and remedial actions associated with the (Loss of Feedwater).	3.2	18
000055 (EPE 55) Station Blackout / 6						X	Loss of Offsite and Onsite Power (Station Blackout) G 2.2.44: 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.	4.2	11
000056 (APE 56) Loss of Offsite Power / 6						X	Loss of Offsite Power G 2.4.21: Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc..	2.9	12
000057 (APE 57) Loss of Vital AC Instrument Bus / 6					X		Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: AA 2.17: System and component status, using local or remote controls	3.1	13
000058 (APE 58) Loss of DC Power / 6	X						Knowledge of the operational implications of the following concepts as they apply to Loss of DC Power: AK 1.01: Battery charger equipment and instrumentation	2.8	14
000062 (APE 62) Loss of Nuclear Service Water / 4									
000065 (APE 65) Loss of Instrument Air / 8									
000077 (APE 77) Generator Voltage and Electric Grid Disturbances / 6				X			Ability to operate and/or monitor the following as they apply to Generator Voltage and Electric Grid Disturbances: AA 1.01: Grid frequency and voltage	3.6	15
(W E04) LOCA Outside Containment / 3									
(W E11) Loss of Emergency Coolant Recirculation / 4									
(BW E04; W E05) Inadequate Heat Transfer—Loss of Secondary Heat Sink / 4									
K/A Category Totals:	3	3	3	3	3	3	Group Point Total:		18

ES-401	PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions—Tier 1/Group 2 (RO/SRO)									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#
000001 (APE 1) Continuous Rod Withdrawal / 1									
000003 (APE 3) Dropped Control Rod / 1					X		Ability to determine and interpret the following as they apply to the Dropped Control Rod: AA 2.03: Dropped rod, using in-core/ex-core instrumentation, in-core or loop temperature measurements	3.6	19
000005 (APE 5) Inoperable/Stuck Control Rod / 1									
000024 (APE 24) Emergency Boration / 1	X						Knowledge of the operational implications of the following concepts as they apply to Emergency Boration: AK1.02: Relationship between boron addition and reactor power	3.6	20
000028 (APE 28) Pressurizer (PZR) Level Control Malfunction / 2									
000032 (APE 32) Loss of Source Range Nuclear Instrumentation / 7									
000033 (APE 33) Loss of Intermediate Range Nuclear Instrumentation / 7									
000036 (APE 36; BW/A08) Fuel-Handling Incidents / 8									
000037 (APE 37) Steam Generator Tube Leak / 3			X				Knowledge of the reasons for the following responses as they apply to the Steam Generator Tube Leak: AK 3.07: actions contained in EOP for S/G tube leak. Note to PSL—please consider “EOP” as “any procedure (abnormal or emergency) that mitigates a steam generator tube leak condition.”	3.1	21
000051 (APE 51) Loss of Condenser Vacuum / 4			X				Knowledge of the reasons for the following responses as they apply to the Loss of Condenser Vacuum: AK 3.01: Loss of steam dump capability upon loss of condenser vacuum	2.8	22
000059 (APE 59) Accidental Liquid Radwaste Release / 9									
000060 (APE 60) Accidental Gaseous Radwaste Release / 9									
000061 (APE 61) Area Radiation Monitoring System Alarms / 7		X					Knowledge of the interrelations between the Area Radiation Monitoring (ARM) System Alarms and the following: AK 2.01: Detectors at each ARM system location	2.5	23
000067 (APE 67) Plant Fire On Site / 8									

ES-401	PWR Examination Outline							Form ES-401-2
Emergency and Abnormal Plant Evolutions—Tier 1/Group 2 (RO/SRO)								
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#
000068 (APE 68; BW A06) Control Room Evacuation / 8		X					Knowledge of the interrelations between the Control Room Evacuation and the following: AK 2.01: Auxiliary shutdown panel layout	3.9	24
000069 (APE 69; W E14) Loss of Containment Integrity / 5									
000074 (EPE 74; W E06 & E07) Inadequate Core Cooling / 4	X						Knowledge of the operational implications of the following concepts as they apply to the Inadequate Core Cooling : EK 1.02: Potential consequences of uncovering the core	4.6	25
000076 (APE 76) High Reactor Coolant Activity / 9									
000078 (APE 78*) RCS Leak / 3									
(W E01 & E02) Rediagnosis & SI Termination / 3									
(W E13) Steam Generator Overpressure / 4									
(W E15) Containment Flooding / 5									
(W E16) High Containment Radiation /9									
(BW A01) Plant Runback / 1									
(BW A02 & A03) Loss of NNI-X/Y/7									
(BW A04) Turbine Trip / 4									
(BW A05) Emergency Diesel Actuation / 6									
(BW A07) Flooding / 8									
(BW E03) Inadequate Subcooling Margin / 4									
(BW E08; W E03) LOCA Cooldown—Depressurization / 4									
(BW E09; CE A13**; W E09 & E10) Natural Circulation/4									
(BW E13 & E14) EOP Rules and Enclosures									
(CE A11**; W E08) RCS Overcooling—Pressurized Thermal Shock / 4									
(CE A16) Excess RCS Leakage / 2									
(CE E09) Functional Recovery						X	Functional Recovery G 2.4.6: Knowledge of EOP mitigation strategies.	3.7	27
(CE E13*) Loss of Forced Circulation/LOOP/Blackout / 4				X			Ability to operate and / or monitor the following as they apply to the (Natural Circulation Operations) AA 1.2: Operating behavior characteristics of the facility.	3.1	26
K/A Category Point Totals:	2	2	2	1	1	1	Group Point Total:		9

ES-401	PWR Examination Outline Plant Systems—Tier 2/Group 1 (RO/SRO)											Form ES-401-2	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#
003 (SF4P RCP) Reactor Coolant Pump									X			Ability to monitor automatic operation of the RCPS, including: A 3.05: RCP lube oil and bearing lift pumps	2.7	28
003 (SF4P RCP) Reactor Coolant Pump											X	Reactor Coolant Pump G 2.4.21: Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	4.0	29
004 (SF1; SF2 CVCS) Chemical and Volume Control			X									Knowledge of the effect that a loss or malfunction of the CVCS will have on the following: K 3.07: PZR level and pressure	3.8	31
004 (SF1; SF2 CVCS) Chemical and Volume Control	X											Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the following systems: K1.18 CCWS	2.9	30
005 (SF4P RHR) Residual Heat Removal								X				Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A 2.01: Failure modes for pressure, flow, pump motor amps, motor temperature, and tank level instrumentation	2.7	32
006 (SF2; SF3 ECCS) Emergency Core Cooling					X							Knowledge of the operational implications of the following concepts as they apply to ECCS: K 5.05: Effects of pressure on a solid system	3.4	33
007 (SF5 PRTS) Pressurizer Relief/Quench Tank											X	Pressurizer Relief/Quench Tank G 2.1.20: Ability to interpret and execute procedure steps.	4.6	34
008 (SF8 CCW) Component Cooling Water		X										Knowledge of bus power supplies to the following: K 2.02: CCW pump, including emergency backup	3.0	35
008 (SF8 CCW) Component Cooling Water				X								Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the following: K 4.02: Operation of the surge tank, including the associated valves and controls	2.9	36
010 (SF3 PZR PCS) Pressurizer Pressure Control						X						Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: K 6.03: PZR sprays and heaters	3.2	37

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#
010 (SF3 PZR PCS) Pressurizer Pressure Control						X						Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: K 6.02 PRZ	2.9	38
012 (SF7 RPS) Reactor Protection							X					Ability to predict and/or monitor Changes in parameters (to prevent exceeding design limits) associated with operating the RPS controls including: A 1.01: Trip setpoint adjustment	2.9	39
013 (SF2 ESFAS) Engineered Safety Features Actuation					X							Knowledge of the operational implications of the following concepts as they apply to the ESFAS: K 5.01: Definitions of safety train and ESF channel	2.8	40
022 (SF5 CCS) Containment Cooling		X										Knowledge of power supplies to the following: K 2.01: Containment cooling fans	3.0	41
025 (SF5 ICE) Ice Condenser														
026 (SF5 CSS) Containment Spray			X									Knowledge of the effect that a loss or malfunction of the CSS will have on the following: K 3.02: Recirculation spray system	4.2	42
039 (SF4S MSS) Main and Reheat Steam										X		Ability to manually operate and/or monitor in the control room: A 4.04: Emergency feedwater pump turbines	3.8	43
059 (SF4S MFW) Main Feedwater	X											Knowledge of the physical connections and/or cause effect relationships between the MFW and the following systems: K 1.03: S/GS	3.1	44
061 (SF4S AFW) Auxiliary/Emergency Feedwater								X				Ability to (a) predict the impacts of the following malfunctions or operations on the AFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A 2.01: Startup of MFW pump during AFW operation	2.5	45
062 (SF6 ED AC) AC Electrical Distribution				X								Knowledge of ac distribution system design feature(s) and/or interlock(s) which provide for the following: K 4.03: Interlocks between automatic bus transfer and breakers	2.8	46
063 (SF6 ED DC) DC Electrical Distribution	X											Knowledge of the physical connections and/or cause effect relationships between the DC electrical system and the following systems: K 1.03: Battery charger and battery	2.9	48
063 (SF6 ED DC) DC Electrical Distribution										X		Ability to manually operate and/or monitor in the control room: A 4.01: Major breakers and control power fuses	2.8	47

ES-401	PWR Examination Outline Plant Systems—Tier 2/Group 1 (RO/SRO)											Form ES-401-2	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#
064 (SF6 EDG) Emergency Diesel Generator						X						Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: K 6.07: Air receivers	2.7	49
073 (SF7 PRM) Process Radiation Monitoring				X								Knowledge of PRM system design feature(s) and/or interlock(s) which provide for the following: K 4.01: Release termination when radiation exceeds setpoint	3.3	51
073 (SF7 PRM) Process Radiation Monitoring							X					Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRM system controls including: A 1.01: Radiation levels	3.2	50
076 (SF4S SW) Service Water		X										Knowledge of bus power supplies to the following: K 2.01: Service water	2.7	53
076 (SF4S SW) Service Water										X		Ability to manually operate and/or monitor in the control room: A 4.02: SWS valves	2.6	52
078 (SF8 IAS) Instrument Air									X			Ability to monitor automatic operation of the IAS, including: A 3.01: Air pressure	3.1	54
103 (SF5 CNT) Containment									X			Ability to monitor automatic operation of the containment system, including: A 3.01: Containment isolation	3.9	55
053 (SF1; SF4P ICS*) Integrated Control														
K/A Category Point Totals:	2	3	2	3	2	3	2	3	3	3	2	Group Point Total:		28

ES-401	PWR Examination Outline Plant Systems—Tier 2/Group 2 (RO/SRO)											Form ES-401-2		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#
001 (SF1 CRDS) Control Rod Drive														
002 (SF2; SF4P RCS) Reactor Coolant					X							Knowledge of the operational implications of the following concepts as they apply to the RCS: K 5.09: Relationship of pressure and temperature for water saturation and subcooling conditions	3.7	56
011 (SF2 PZR LCS) Pressurizer Level Control									X			Ability to monitor automatic operation of the PZR LCS, including: A 3.03: Charging and letdown	3.2	57
014 (SF1 RPI) Rod Position Indication														
015 (SF7 NI) Nuclear Instrumentation		X										Knowledge of bus power supplies to the following: K 2.01: NIS channels, components, and interconnections	3.3	58
016 (SF7 NNI) Nonnuclear Instrumentation														
017 (SF7 ITM) In-Core Temperature Monitor	X											Knowledge of the physical connections and/or cause effect relationships between the ITM system and the following systems: K 1.01: Plant computer	3.2	59
027 (SF5 CIRS) Containment Iodine Removal								X				Ability to (a) predict the impacts of the following malfunctions or operations on the CIRS; and (b) based on those predictions, use Procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A 2.01: High temperature in the filter system	3.0	60
028 (SF5 HRPS) Hydrogen Recombiner and Purge Control														
029 (SF8 CPS) Containment Purge														
033 (SF8 SFPCS) Spent Fuel Pool Cooling			X									Knowledge of the effect that a loss or malfunction of the Spent Fuel Pool Cooling System will have on the following: K 3.03: Spent fuel temperature	3.0	61
034 (SF8 FHS) Fuel-Handling Equipment						X						Knowledge of the effect of a loss or malfunction on the following will have on the Fuel Handling System: K 6.02: Radiation monitoring systems	2.6	62
035 (SF 4P SG) Steam Generator														
041 (SF4S SDS) Steam Dump/Turbine Bypass Control							X					Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SDS controls including: A 1.02: Steam pressure	3.1	63
045 (SF 4S MTG) Main Turbine Generator														
055 (SF4S CARS) Condenser Air Removal														
056 (SF4S CDS) Condensate														
068 (SF9 LRS) Liquid Radwaste														

ES-401	PWR Examination Outline Plant Systems—Tier 2/Group 2 (RO/SRO)											Form ES-401-2	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#
071 (SF9 WGS) Waste Gas Disposal											X	Waste Gas Disposal G 2.1.7: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	64
072 (SF7 ARM) Area Radiation Monitoring														
075 (SF8 CW) Circulating Water				X								Knowledge of circulating water system design feature(s) and interlock(s) which provide for the following: K 4.01: Heat sink	2.5	65
079 (SF8 SAS**) Station Air														
086 Fire Protection														
050 (SF 9 CRV*) Control Room Ventilation														
K/A Category Point Totals:	1	1	1	1	1	1	1	1	1	0	1	Group Point Total:		10/3

Facility:		Date of Exam:				
Category	K/A #	Topic	RO		SRO-only	
			IR	#	IR	#
1. Conduct of Operations	2.1.26	Knowledge of industrial safety procedures (such as rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen).	3.4	66		
	2.1.38	Knowledge of the station's requirements for verbal communications when implementing procedures.	3.7	67		
	2.1.40	Knowledge of refueling administrative requirements.	2.8	68		
	2.1.					
	2.1.					
	2.1.					
	Subtotal					
2. Equipment Control	2.2.3	Knowledge of the design, procedural, and operational differences between units.	3.8	69		
	2.2.41	Ability to obtain and interpret station electrical and mechanical drawings.	3.5	70		
	2.2.6	Knowledge of the process for making changes to procedures.	3.0	71		
	2.2.					
	2.2.					
	2.2.					
	Subtotal					
3. Radiation Control	2.3.5	Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9	72		
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	Subtotal					
4. Emergency Procedures/Plan	2.4.2	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.	4.5	73		
	2.4.27	Emergency Procedures / Plan: Knowledge of “fire in the plant procedures	3.6	74		
	2.4.39	Knowledge of RO responsibilities in emergency plan implementation.	3.9	75		
	2.4.					
	2.4.					
	2.4.					
	Subtotal					
Tier 3 Point Total				10		7

Tier/Group	Randomly Selected K/A	Reason for Rejection

Facility: St Lucie SRO Exam Date of Exam: March 2019

Tier	Group	RO K/A Category Points												SRO-Only Points						
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2		G*		Total		
1. Emergency and Abnormal Plant Evolutions	1				N/A					N/A			18	3		3		6		
	2												9	2		2		4		
	Tier Totals												27	5		5		10		
2. Plant Systems	1												28	2		3		5		
	2												10	1	1	1		3		
	Tier Totals												38	4		4		8		
3. Generic Knowledge and Abilities Categories		1		2		3		4		10		1	2	3	4	7				
												2	2	1	2					

Note:
1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outline sections (i.e., except for one category in Tier 3 of the SRO-only section, the "Tier Totals" in each K/A category shall not be less than two). (One Tier 3 radiation control K/A is allowed if it is replaced by a K/A from another Tier 3 category.)
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points, and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the 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.
4. Select topics from as many systems and evolutions as possible. Sample every system or evolution in the group before selecting a second topic for any system or evolution.
5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
7. The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' 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.
9. For Tier 3, select topics from Section 2 of the K/A catalog and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

G* Generic K/As

* These systems/evolutions must be included as part of the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan. They are not required to be included when using earlier revisions of the K/A catalog.

** These systems/evolutions may be eliminated from the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan.

ES-401	PWR Examination Outline Emergency and Abnormal Plant Evolutions—Tier 1/Group 1 (RO/SRO)						Form ES-401-2	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#
000007 (EPE 7; BW E02&E10; CE E02) Reactor Trip, Stabilization, Recovery / 1					X		Ability to determine or interpret the following as they apply to a reactor trip: EA 2.03: Reactor trip breaker position	4.4	76
000008 (APE 8) Pressurizer Vapor Space Accident / 3									
000009 (EPE 9) Small Break LOCA / 3									
000011 (EPE 11) Large Break LOCA / 3									
000015 (APE 15) Reactor Coolant Pump Malfunctions / 4									
000022 (APE 22) Loss of Reactor Coolant Makeup / 2						X	Loss of Reactor Coolant Makeup G 2.2.12: Knowledge of surveillance procedures.	4.1	77
000025 (APE 25) Loss of Residual Heat Removal System / 4					X		Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: AA 2.06: Existence of proper RHR overpressure protection	3.4	78
000026 (APE 26) Loss of Component Cooling Water / 8									
000027 (APE 27) Pressurizer Pressure Control System Malfunction / 3									
000029 (EPE 29) Anticipated Transient Without Scram / 1									
000038 (EPE 38) Steam Generator Tube Rupture / 3						X	Steam Generator Tube Rupture / 3 G 2.1.19: Ability to use plant computers to evaluate system or component status.	3.8	79
000040 (APE 40; BW E05; CE E05; W E12) Steam Line Rupture—Excessive Heat Transfer / 4									
000054 (APE 54; CE E06) Loss of Main Feedwater /4									
000055 (EPE 55) Station Blackout / 6									
000056 (APE 56) Loss of Offsite Power / 6									
000057 (APE 57) Loss of Vital AC Instrument Bus / 6									
000058 (APE 58) Loss of DC Power / 6									
000062 (APE 62) Loss of Nuclear Service Water / 4					X		Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: AA 2.01: Location of a leak in the SWS	3.5	80
000065 (APE 65) Loss of Instrument Air / 8						X	Loss of Instrument Air / 8 G 2.4.8: Knowledge of how abnormal operating procedures are used in conjunction with EOPs.	4.5	81
000077 (APE 77) Generator Voltage and Electric Grid Disturbances / 6									
(W E04) LOCA Outside Containment / 3									

ES-401	PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions—Tier 1/Group 1 (RO/SRO)									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#
(W E11) Loss of Emergency Coolant Recirculation / 4									
(BW E04; W E05) Inadequate Heat Transfer—Loss of Secondary Heat Sink / 4									
K/A Category Totals:					3	3	Group Point Total:		6

ES-401	PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions—Tier 1/Group 2 (RO/SRO)									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#
000001 (APE 1) Continuous Rod Withdrawal / 1									
000003 (APE 3) Dropped Control Rod / 1									
000005 (APE 5) Inoperable/Stuck Control Rod / 1									
000024 (APE 24) Emergency Boration / 1									
000028 (APE 28) Pressurizer (PZR) Level Control Malfunction / 2					X		Ability to determine and interpret the following as they apply to the Pressurizer Level Control Malfunctions: AA 2.01: PZR level indicators and alarms	3.6	82
000032 (APE 32) Loss of Source Range Nuclear Instrumentation / 7						X	Loss of Source Range Nuclear Instrumentation / 7 G 2.1.27: Knowledge of system purpose and/or function.	4.0	83
000033 (APE 33) Loss of Intermediate Range Nuclear Instrumentation / 7									
000036 (APE 36; BW/A08) Fuel-Handling Incidents / 8					X		Ability to determine and interpret the following as they apply to the Fuel Handling Incidents: AA 2.01: ARM system indications	3.9	84
000037 (APE 37) Steam Generator Tube Leak / 3									
000051 (APE 51) Loss of Condenser Vacuum / 4									
000059 (APE 59) Accidental Liquid Radwaste Release / 9									
000060 (APE 60) Accidental Gaseous Radwaste Release / 9									
000061 (APE 61) Area Radiation Monitoring System Alarms / 7									
000067 (APE 67) Plant Fire On Site / 8									
000068 (APE 68; BW A06) Control Room Evacuation / 8									
000069 (APE 69; W E14) Loss of Containment Integrity / 5									
000074 (EPE 74; W E06 & E07) Inadequate Core Cooling / 4									
000076 (APE 76) High Reactor Coolant Activity / 9									
000078 (APE 78*) RCS Leak / 3									
(W E01 & E02) Rediagnosis & SI Termination / 3									
(W E13) Steam Generator Overpressure / 4									
(W E15) Containment Flooding / 5									
(W E16) High Containment Radiation /9									
(BW A01) Plant Runback / 1									
(BW A02 & A03) Loss of NNI-X/Y/7									
(BW A04) Turbine Trip / 4									
(BW A05) Emergency Diesel Actuation / 6									
(BW A07) Flooding / 8									
(BW E03) Inadequate Subcooling Margin / 4									
(BW E08; W E03) LOCA Cooldown—Depressurization / 4									
(BW E09; CE A13**; W E09 & E10) Natural Circulation/4									
(BW E13 & E14) EOP Rules and Enclosures									

ES-401	PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions—Tier 1/Group 2 (RO/SRO)									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#
(CE A11**; W E08) RCS Overcooling—Pressurized Thermal Shock / 4									
(CE A16) Excess RCS Leakage / 2						X	Excess RCS Leakage / 2 G 2.4.23: Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations	4.4	85
(CE E09) Functional Recovery									
(CE E13*) Loss of Forced Circulation/LOOP/Blackout / 4									
K/A Category Point Totals:					2	2	Group Point Total:		4

ES-401	PWR Examination Outline Plant Systems—Tier 2/Group 1 (RO/SRO)											Form ES-401-2		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#
003 (SF4P RCP) Reactor Coolant Pump														
003 (SF4P RCP) Reactor Coolant Pump														
004 (SF1; SF2 CVCS) Chemical and Volume Control														
005 (SF4P RHR) Residual Heat Removal														
006 (SF2; SF3 ECCS) Emergency Core Cooling														
007 (SF5 PRTS) Pressurizer Relief/Quench Tank														
008 (SF8 CCW) Component Cooling Water														
010 (SF3 PZR PCS) Pressurizer Pressure Control														
012 (SF7 RPS) Reactor Protection								X				Ability to (a) predict the impacts of the following malfunctions or operations on the RPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A 2.05: Faulty or erratic operation of detectors and function generators	3.2	86
013 (SF2 ESFAS) Engineered Safety Features Actuation								X				Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS; and (b) based Ability on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations; A 2.06: Inadvertent ESFAS actuation	4.0	87
022 (SF5 CCS) Containment Cooling														
025 (SF5 ICE) Ice Condenser														
026 (SF5 CSS) Containment Spray											X	Containment Spray G 2.4.46: Ability to verify that the alarms are consistent with the plant conditions.	4.2	88
039 (SF4S MSS) Main and Reheat Steam														
059 (SF4S MFW) Main Feedwater											X	Main Feedwater G 2.1.7: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.7	89
061 (SF4S AFW) Auxiliary/Emergency Feedwater														
062 (SF6 ED AC) AC Electrical Distribution														

ES-401	PWR Examination Outline Plant Systems—Tier 2/Group 1 (RO/SRO)											Form ES-401-2	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#
063 (SF6 ED DC) DC Electrical Distribution														
064 (SF6 EDG) Emergency Diesel Generator														
073 (SF7 PRM) Process Radiation Monitoring														
076 (SF4S SW) Service Water														
078 (SF8 IAS) Instrument Air														
103 (SF5 CNT) Containment											X	Containment G 2.2.38: Knowledge of conditions and limitations in the facility license.	4.5	90
053 (SF1; SF4P ICS*) Integrated Control														
K/A Category Point Totals:								2			3	Group Point Total:		5

ES-401	PWR Examination Outline Plant Systems—Tier 2/Group 2 (RO/SRO)											Form ES-401-2		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#
001 (SF1 CRDS) Control Rod Drive								X				Ability to (a) predict the impacts of the following malfunction or operations on the CRDS- and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A 2.06: Effects of transient xenon on reactivity	3.7	91
002 (SF2; SF4P RCS) Reactor Coolant														
011 (SF2 PZR LCS) Pressurizer Level Control														
014 (SF1 RPI) Rod Position Indication														
015 (SF7 NI) Nuclear Instrumentation														
016 (SF7 NNI) Nonnuclear Instrumentation											X	Nonnuclear Instrumentation G 2.2.3: Knowledge of the design, procedural, and operational differences between units.	3.9	92
017 (SF7 ITM) In-Core Temperature Monitor														
027 (SF5 CIRS) Containment Iodine Removal														
028 (SF5 HRPS) Hydrogen Recombiner and Purge Control														
029 (SF8 CPS) Containment Purge														
033 (SF8 SFPCS) Spent Fuel Pool Cooling														
034 (SF8 FHS) Fuel-Handling Equipment				X								Knowledge of the design Feature(s) and/or interlock(s) which provide for the following: K4.02: Fuel Movements	3.3	93
035 (SF 4P SG) Steam Generator														
041 (SF4S SDS) Steam Dump/Turbine Bypass Control														
045 (SF 4S MTG) Main Turbine Generator														
055 (SF4S CARS) Condenser Air Removal														
056 (SF4S CDS) Condensate														
068 (SF9 LRS) Liquid Radwaste														
071 (SF9 WGS) Waste Gas Disposal														
072 (SF7 ARM) Area Radiation Monitoring														
075 (SF8 CW) Circulating Water														
079 (SF8 SAS**) Station Air														
086 Fire Protection														
050 (SF 9 CRV*) Control Room Ventilation														
K/A Category Point Totals:				1				1			1	Group Point Total:		3

Facility: St Lucie SRO Draft Date of Exam: March 2019

Category	K/A #	Topic	RO		SRO-only	
			IR	#	IR	#
1. Conduct of Operations	2.1.30	Ability to locate and operate components, including local controls.			4.0	94
	2.1.37	Knowledge of procedures, guidelines, or limitations associated with reactivity management.			4.6	95
	2.1.					
	2.1.					
	2.1.					
	2.1.					
	Subtotal					
2. Equipment Control	2.2.25	Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.			4.2	96
	2.2.38	Knowledge of conditions and limitations in the facility license.			4.5	97
	2.2.					
	2.2.					
	2.2.					
	2.2.					
	Subtotal					
3. Radiation Control	2.3.11	Ability to control radiation releases.			4.3	98
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	Subtotal					
4. Emergency Procedures/Plan	2.4.32	Knowledge of operator response to loss of all annunciators.			4.0	99
	2.4.43	Knowledge of emergency communications systems and techniques.			3.8	100
	2.4.					
	2.4.					
	2.4.					
	2.4.					
	Subtotal					
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1	025 AA2.06	Overlaps with the exact KA on the SRO Exam 025 AA2.06 Chief Examiner randomly and systematically selected new K/A: **025AA2.04**: Loss of RHR, ability to determine and interpret the following as they apply to Loss of RHR—Location and isolability of leaks.
1/1	025 AA2.04	Could not write operationally valid RO level question Chief Examiner randomly and systematically selected new K/A: **025AA2.02**: Loss of RHR, Leakage of reactor coolant from RHR into closed cooling water system or into reactor building atmosphere
1/1	038 EA1.07	SGTR PRT Tank temperature pressure and setpoints. PSL design has no correlation between PRT operations and SGTRs. Chief Examiner randomly and systematically selected new K/A: **038EA1.36**: Steam Generator Tube Rupture (SGTR), ability to operate and monitor the following as they apply to a SGTR—Cooldown of RCS to specified temperature.
1/2	037 AK3.06	PSL does not have any NORMAL operating precautions to preclude or minimize SGTR. Chief Examiner randomly and systematically selected new K/A: **037AK3.07**: Steam Generator Tube Leak, knowledge of the reasons for the following responses as they apply to the Steam Generator Tube Leak—actions contained in EOP for S/G tube leak. Note to PSL—please consider "EOP" as "any procedure (abnormal or emergency) that mitigates a steam generator tube leak condition."
2/1	010 K6.04	This is excessive overlap on PRT. PRT has 4 questions on the exam. Chief Examiner randomly and systematically selected new K/A: **010K6.02**: Pressurizer Pressure Control System (PZR PCS), knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS—PZR.

2/1	073 K4.02	PSL does not have Letdown isolation on High RCS Activity Chief Examiner randomly and systematically selected new K/A: **073K4.01**: Process Radiation Monitoring (PRM) System, knowledge of PRM system design feature(s) and/or interlock(s) which provide for the following—Release termination when radiation exceeds setpoint.
3	G2.4.22	Knowledge of the Bases for prioritizing safety functions is an SRO function. Chief Examiner randomly and systematically selected new K/A: **G2.4.27**: Knowledge of "fire in the plant" procedures.
1/2	A16 G2.4.45	Excessive RCS Leakage / Ability to prioritize and interpret the significance of each annunciator or alarm **A16 2.4.23** Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.
2/1	004 A2.24	Could not write operationally valid RO level question Chief Examiner randomly and systematically selected new K/A: 004 K1.18 / Chemical and Volume Control / Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the following systems: CCWS
2/2	045 A2.17	Could not write operationally valid SRO level question Chief Examiner randomly and systematically selected new K/A: 034 K4.02 Knowledge of design feature(s) and/or interlock(s) which provide for the following: Fuel movement

ES-401	Written Examination Quality Checklist	Form ES-401-6

Facility: St. Lucie | Date of Exam: 3/18/19 | Exam Level: RO [X] SRO [X]

	Item Description	Initial a	Initial b*	Initial c*#
1.	Questions and answers are technically accurate and applicable to the facility.	W	B	ML
2.	a. NRC K/As are referenced for all questions. b. Facility learning objectives are referenced as available. c. Correct answer explanation and distractor analysis provided (ES-401, D.2.g)	W	B	ML
3.	SRO questions are appropriate in accordance with Section D.2.d of ES-401	W	B	ML
4	The sampling process was random and systematic. (If more than four RO or two SRO questions were repeated from the last two NRC licensing exams, consult the NRR/NRO OL program office).	W	B	ML
5.	Question duplication from the licensee screening/audit exam was controlled as indicated below (check the item that applies) and appears appropriate. __ The audit exam was systematically and randomly developed, or X the audit exam was completed before the license exam was started, or __ the examinations were developed independently, or __ the licensee certifies that there is no duplication, or __ other (explain).	W	B	ML

		Bank	Modified	New			
6.	Bank use meets limits (no more than 75% from the bank, at least 10% new, and the rest new or modified); enter the actual RO/SRO-only question distribution(s) at right.	23/3	4/2	48/20	W	B	ML

		Memory	C/A			
7.	Between 38 and 45 questions of the questions on the RO exam and at least 13 questions of the questions on the SRO-only portion of the exam are written at the comprehension/analysis level (see ES-401, D.2.c); enter the actual RO/SRO-only question distribution(s) at right.	34/5	41/20	W	B	ML

8.	References/handouts provided do not give away answers or aid in the elimination of distractors.	W	B	ML
9.	Question content conforms to specific K/A statements in the previously approved examination outline and is appropriate for the tier to which they are assigned; deviations are justified.	W	B	ML
10.	Question psychometric quality and format meet the guidelines in Appendix B.	W	B	ML
11.	The exam contains the required number of one-point, multiple-choice items; the total is correct and agrees with the value on the cover sheet.	W	B	ML

	Printed Name/Signature	Date
a. Author	Sean Wylie /	3.4.19
b. Facility Reviewer (*)	Terry Benton /	3.4.19
c. NRC Chief Examiner (#)	Michael Kennard	3-5-2019
d. NRC Regional Supervisor	Gerald J. McCoy	3/13/2019

Note: * The facility reviewer's initials or signature are not applicable for NRC-developed examinations.
Independent NRC reviewer initials items in Column "c"; chief examiner concurrence is required.

Instructions

[Refer to Section D of ES-401 and Appendix B for additional information regarding each of the following concepts.]

1. Enter the level of knowledge (LOK) of each question as either (F)undamental or (H)igher cognitive level.

2. Enter the level of difficulty (LOD) of each question using a 1 to 5 (easy to difficult) rating scale (questions in the 2 to 4 range are acceptable).

3. Check the appropriate box if a psychometric flaw is identified:

a. The stem lacks sufficient focus to elicit the correct answer (e.g., unclear intent, more information is needed, or too much needless information).

b. The stem or distractors contain cues (i.e., clues, specific determiners, phrasing, length, etc).

c. The answer choices are a collection of unrelated true/false statements.

d. The distractors are not credible; single implausible distractors should be repaired, more than one is unacceptable.

e. One or more distractors is (are) partially correct (e.g., if the applicant can make unstated assumptions that are not contradicted by stem).

4. Check the appropriate box if a job content error is identified:

a. The question is not linked to the job requirements (i.e., the question has a valid K/A but, as written, is not operational in content).

b. The question requires the recall of knowledge that is too specific for the closed reference test mode (i.e., it is not required to be known from memory).

c. The question contains data with an unrealistic level of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons).

d. The question requires reverse logic or application compared to the job requirements.

5. Check questions that are sampled for conformance with the approved K/A and those that are designated SRO-only (K/A and license level mismatches are unacceptable).

6. Enter question source: (B)ank, (M)odified, or (N)ew. Check that (M)odified questions meet criteria of ES-401 Section D.2.f.

7. Based on the reviewer's judgment, is the question as written (U)nsatisfactory (requiring repair or replacement), in need of (E)ditorial enhancement, or (S)atisfactory?
Place the answer letter here
Place the 55.41 or 55.43 item here

8. At a minimum, explain any Unsat ratings (e.g., how the Appendix B psychometric attributes are not being met).

	1. LOK	2. LOD	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6	7	Ans Letter	CFR	8
Q#	(F/H)	(1-5)	stem focus	cueing	T/F	cred dist	partial	job link	minutia	# / units	back-ward	K/A	SRO-only	B/M/N	U/E/S	A/B/C/D	55.41x55.43y	Explanation
																		General Notes: 1. The K/A should not be listed before the question on the version handed out to the student. 2. Make sure that if a procedure is stated in the stem or distractors that the noun name is included,
1	H	3												N	S	C	41.10	CFR march is 41.10, RO questions must be From 10CFR55.41X. Corrected

2	H	3				X								N	S	D	41.7	The question is leading, if the first half is in psig and the second half asks if the absouute pressure would be higher or lower would not the absolute pressure always be higher than the psig setpoint? that would make A and C not credible. This is a system question. No procedural knowledge is required to answer the question. Tier 1 should be written to address some type of abnormal/emergency procedure knowledge if at all possible. Would like to discuss the posibility to modify the question to incorporate something form the EOP/ARP/AOP. Maybe break it up into with the PORV leaking what AOP's have met their entry conditions 2 AOP 1.08 and 2 AOP1.10, then have the SBLOCA in containment 3 psig and rising, would the rupture disc go at HIger or lower than 100 psia. The Change provided is not what was discussed but will be considered Sat
3	F	2												N	S	A	41.5	
4	H	2												B	S	C	41.10	2017 NRC exam
5	H	3				X								N	S	B	41.5	leak in a shutdown heat exchanger? Corrected
6	H	2												N	S	B	41.3	CFR march is 41.3, RO questions must be From 10CFR55.41X. Your lesson plan does not indicate that the CCW could ever go into the RCS. Is there any case where this would happen under normal plant shutdown conditions? I do not think so as the RHR pump discharge is higher than the CCW system pressure. if this is true at least remove the running reactor coolant pumps from the stem. Corrected

7	F	2												N	S	B	41.5	
8	F	2												M	S	B	41.7	This is a tier 2 question. Would perfer that the question delt with a procedure. Truly skirting the intent of tier 1. Corrected
9	F	2												N	S	A	41.7	Change the K/A to the correct one, The KA. Is EK 2.06 not 2.08, 2.08 does not exsist. Tier 2 question. This is a systems level question only I do not see any EOP or AOP procedures that would encompass this K/A as all of the actions that occur during an atws are covered in EOP-1 manually. Corrected
10	F	2												N	S	A	41.7	
11	H	3												N	S	D	41.5	
12	H	3												N	S	C	41.7	Reference provided. Is the only reference the SCM pages that are diaplayed? If so this question is sat
13	F	2					X							N	S	C	41.6	the only reason that this is unsat is because the first half of the question has two correct answers, if four trip breakers will open then 2 would have opened as well, Need to determine some wording to lock down why 2 is not the correct answer, Maybe change the question to "Only _____ Trip Circuit Breakers will Open" that way 2 is worng and four would be the only correct answer. Corrected
14	F	2												N	S	D	41.8	Free Review No issues
15	H	3												N	S	C	41.5	What would make anyone think that making a switchyard voltage adjustment would not require a log entry? does not seem credible to me. Corrected
16	F	2												N	S	D	41.8	
17	H	3												B	S	C	41.7	2017 NRC exam

18	H	2												B	S	B	41.8	Listed as an edit until clarification, Would distractors C and D regain power to the lost bus? How credible is in accordance with EOP to have options that are not covered in the EOP? Corrected
19	H	2												N	S	D	41.6	
20	H	2												N	S	A	41.8	Free Review No issues, Modified the question since the free review still sat removed the one hour or less tech spec portion of the question.
21	F	2												N	S	A	41.5	
22	F	2												B	S	C	41.10	Free Review provide the noun name for SBCS in the stem. Corrected
23	F	2												B	S	D	41.5	For distractor A does the pre-trip come form the ARM in the answer. Meaning would a high failure cause the pretrip to actuate the alarm? Corrrected
24	F	2												B	S	B	41.7	
25	H	3										X		N	S	A	41.8	The question as written addresses the indications of core uncovery not the potiential consequences of uncovering the core. Corrected
26	H	2												B	S	A	41.7	Consider putting the noun names of the SBCS and ADV's in the answer. it is not a requirement as long as it is listed as SBCS/ADV in the EOP or AOP's
27	H	2												N	S	D	41.10	Add titles to Figure 1A and Figure 1B, Just the RCS Pressure Temperature part not the Containment information as that is not part of the title. While this does not help or hurt the student it is in keeping with ensuring that titles are attached to the procedure numbers. Corrected

28	H	2												B	S	C	41.7	
29	H	2												N	S	C	41.7	
30	H	2												N	S	A	41.9	Do you expect an RO to know this? NEW K/A Selected.1/28/2019. New question Sat
31	H	2												N	S	C	41.7	
32	H	3												N	S	D	41.5	The indication for cavitation is a GFES level question. Could make is a single answer question, A. Start another LPI pump, B. Stop the cavatating pump then start the standy pump, C. stop the pump and vent the suction and restart, throttle close the LPSI header injection valves. This would get rid of the GFES part without adding anyreal difficulty to the question. Corrected
33	H	3												N	S	D	41.5	
34	L	2												B	S	A	41.7	the K/A is for ability to execute procedure steps not what the step is. The K/A is more like the dirrecnce between ensure and verify, perform and goto like statements. This can be done with an example from the procedure and then use the conduct of opertions or procedure use procedure to execute. Question allowed after discussion with facility
35	H	3												N	S	C	41.7	
36	L	3												N	S	B	41.7	
37	H	2												B	S	D	41.7	
38	H	3												N	S	A	41.7	
39	F	2												N	S	D	41.5	

40	F	2												M	S	C	41.5	Free Review the wording for the first half of distractor C and D is difficult to read. Consider rewording the stem to make it read better similar to "On Unit 2, manual initiation of AFAS-2 at RTGB-202 requires (two specific or any two) of four channels to actuate (one or two) train(s) of Auxiliary Feedwater flow?". since this is a modified bank question you need to include the parent question for me to determine if it meets the modified requirements in the NUREG. **Question has been revised and is now Sat**
41	L	2												B	S	A	41.7	
42	H	2												B	S	A	41.7	
43	L	2												M	S	C	41.7	
44	H	2												B	S	D	41.2	
45	F	2												N	S	A	41.5	Free Review, The initial K/A mismatch was addressed and the Question is now SAT
46	L	2												N	S	D	41.7	Are there any electrical swaps that occur from the ovation platform? I am trying to determine plasuability. Should be able to clear this questions with some training from you part. Item is Sat
47	H	2												N	S	B	41.7	

48	F	4												N	S	A	41.4	The 1C and !D battery chargers are full service chargers and the above the line portion of the TS only states that DC bus 1A and 1B have a full capacity charger tied to it. So I am gussessing that the reason that the 1C and 1D charger is not allowed is somewhere in the basis or surviellance which is beyond the requirements for RO level of knowledge. IF you have a specific RO objective and your site's operations rep believe that this is RO level I am willing to accept it but the pedigree needs to state that. Additional information provided and it is RO level knowledge
49	H	2												N	E	A	41.7	
50	L	3												N	S	D	41.5	
51	L	2												N	S	A	41.7	
52	L	2	X											N	S	B	41.7	The second half of the question is lacking focus to restore IA header pressure with the conpressors… when it is lost. Did we assume that they were closed when you said that we could or could not operate them from the control room? The question just lacks focus Adjusted initial contiditona in stem to clear focus
53	L	2												M	S	B	41.7	Change distractor A to state that no ICW pumps would be running until the time dealy is complete. Which is correct but not for the condition given in the stem having been 10 seconds. Modified the question so A is now the correct answer
54	L	2												B	S	C	41.7	

55	H	3												B	S	A	41.7	the explination for distractor C makes no sense for the CSAS potion as it is not part of the distractor. Remove. Changed
56	H	3												B	S	C	41.5	2017 NRC exam
57	H	3												B	S	C	41.7	Change after 3 minutes to after 170 seconds. Changed
58	H	2												B	S	D	41.7	Dis tractor C and D are Subsets, if 4 TCBs are open then 2 TCB's are open as well making C a correct answer as well of could at least be argued as one. If you changed the distractors to ONLY (2/4/8) TCB's open it would fix the question. The fix is an editorial change only. Corrected
59	L	3												N	S	B	41.7	
60	H	4												N	S	D	41.7	I think that this may be beyond the level for an RO applicant. RO Learning objective and station managemnet believes this is RO level
61	H	2												B	S	D	41.7	
62	F	3												B	S	A	41.7	
63	L	2												N	S	C	41.7	
64	H	3												N	S	C	41.7	
65	L	2												B	S	A	41.7	
66	H	3												B	S	C	41.7	
67	L	2												N	S	B	41.7	
68	L	2												N	S	C	41.7	
69	L	2												B	S	D	41.7	
70	H	3												N	S	A	41.7	Reference Provided, What is the Documentum Search? Would it provide the current Revision? If so where does it say that that method cannot be used? Question could become sat with the above question answered. Questions resolved
71	L	2												N	S	C	41.7	
72	L	2												N	S	A	41.7	

73	H	2												N	S	A	41.7	The K/A is asking for What parameter will cause EOP entry conditions not what caused the trip. I understand that a trip will result in an EOP entry but you have not asked this. A better way to address this is to give the parameters and have the applicant state what EOP they are in. this may result in needing to give several close parameters that would result in meeting the entry conditons, like a small RCS leak, SGTL, a turbine paramenter that would auto trip the turbine with power below the auto trip set point and the low SG level. then ask what parameter would require EOP-X entry. Also as written if the administrative limit of 50% is reached does that require a procedural trip and EOP entry? if so that would make 1B S/G level a correct response and lead to leading the applicant away from the correct response. Corrected
74	L	3												N	S	C	41.10	Are the terms M1 and M3 common knowledge and would an Ro be expected to know them without reference?
75	L	2												N	S	A	41.10	
76	H	3												N	S	C	43.5	Distractor Analysis for part 1 of A and B does not make sense I think you may have left out some words. Corrected
77	H	3												N	S	A	43.2	

78	H	3	X											N	S	D	43.5	Reference Provided. What would Cold leg temperature get to prior to reaching either the 490psia or the 500 psia value for isolation of Decay heat removal. Is there any plant data that would support that the 132 degree thershold be met? Show plant data that shows that cold leg temperature would not rise to >132 degrees. Corrected
79	H	2												N	S	A	43.5	Reference Provided. Only the three pictures are to be given correct or are you planning on giving the EPIP. I do not believe that the EPIP is necessary to answer the question. You have no indication that any other barriers are in any abnormal state. Removed some of the reference now
80	H	3												B	S	A	43.5	Free Review This is not an SRO level question the first half is system level only and knowing the non-safety portion of the system is isolated by that vavle it stands to reason that TS would not be applicable. Updated question, Question is now SAT with Revisions that were made.
81	L	2												N	S	A	43.5	
82	H													B	S	A	43.5	Reference Provided. 2017 NRC EXAM

83	H	2											X	N	S	C	43.5	Free Review Does not meet SRO only criteria. Specifically the first half of the question is a system level question not meeting SRO criteria, the seconld half is a lookup form a reference where all that is needed is to know what mode you are in to determine what column to read the chart. Understanding the diffrence between operable and operating is not a sufficient reason to make something plasuable. Updated Question is still UNSAT with no reference knowledge it only makes common sense that if you have a low boron concentration alarm that a sample would be required. Is there a way to incorporate procedure selection in this. basically jsut ask based on only 1 SR insturment failed Boron Detection Sampling is required per TS 3/4.1.1 Boron
84	H	2											X	M	S	A	43.5	Reference Provided. Two issues knowing what the colors mean red dark blue yellow ect is testing the same knowledge that is on Question 72 of the RO exam. The second item is that with the reference provided it is a direct lookup for theSRO portion and the second half of the question is RO system level knowledge. An example woudl be there are (4 or 6) SFP radiations monitors and (2 or 4) are required to be operable per TS 3.3.3.1. provide a ts knowledge beyond the above the line information. no reference would be required. Question accepted after discussions with facility
85	H	3												N	S	C	43.5	Reference Provided
86	H	2												M	S	C	43.5	first half of question is RO knowledge, Second half is SRO only.

87	H	1											X	N	S	C	43.5	Reference Provided. With the reference provide the SRO portion becomes LOD 1 direct lookup. Knowing if something is reportable or not should not require a reference. The question as written is only testing the ability of the applicant to read. The first half of the question is RO level. Removed the definition sections of the refernce so that direct lookup is avioded
88	H	2												N	S	A	43.5	Free Review
89	H	2												N	S	A	43.5	Free Review
90	H	2												N	S	D	43.5	
91	H	2												N	S	B	43.5	First half of question is RO level.
92	H	3												N	S	B	43.5	
93	H	2												N	S	B	43.5	Reference Provided. The K/A is asking you to use procedures to mitigate the issue not if it is reportable.or not. Always on an A.2 K/A if you cannot write a question to that covers both aspects of the K/A always writhe the the (b) part the procedure section. I have been looking to see if I could come up with an SRO level question for this K/A. we may need to resample this one. Let me know what you think. NEW K/A assigned. New Question SAt
94	L	2												N	S	C	43.5	
95	L	3												B	S	A	43.5	2014 NRC Exam
96	L	3												N	S	C	43.2	

97	H	2					X							B	E	D	43.2	Reference Provided, First off the reference is not required as you have told then that they are in 3.5.2 so no need to give them that. Second issue is that distractor A is actually correct as well while you are in the conditions of answer D you are also bound by the requirements of A which makes is a correct choice.
98	H	3												M	S	B	43.5	Free Review
99	H	2												N	S	A	43.5	Reference Provided. Wording on the first bullet is off. I do not like the reference but I am willing to allow as long as the definition of a major tranisent is not included. Otherwise it becomes a direct lookup. Removed some of the basis references
100	L	2												N	S	C	43.5	

Results Table

RO LOK -H	38		Avg RO LOD		2.36
RO LOK-F	17		AVG SRO LOD		2.33
SRO LOK - H	20		Overall LOD		2.35
SRO LOK - F	0				
		%			%
RO Bank	23	30.67	SRO Bank	4	16
RO Mod	4	5.333	SRO Mod	2	8
RO New	48	64	SRO New	18	72
		%			
Total Bank	27	27			
Total Mod	6	6			
Total New	66	66			
		%			%
RO Sat	74	98.67	SRO Sat	24	96
RO Unsat	0	0	SRO Unsat	0	0
RO Edit	1	1.333	SRO Edit	1	4

Flaws	
Stem focus	2
Cues	0
T/F	0
Cred Dist	2
Partial	2
job link	0
units	0
minutia	0
backward	0
KA	1
SRO-only	3
LOD = 1	1

Answer Dist (in %)			
RO-A	23	SRO-A	10

10 CFR Distribution			
41.1	6	43.1	0
41.2	1	43.2	3
41.3	1	43.3	0
41.4	1	43.4	0
41.5	14	43.5	22
41.6	2	43.6	0
41.7	44	43.7	0
41.8	5		
41.9	1		
41.10	6		
41.11	0		
41.12	0		
41.14	0		
41.14	0		

		%			%
Total Sat	98	98	Total Unsat	0	0
Total Edit	2	2			

RO-B	12	SRO-B	4
RO-C	22	SRO-C	8
RO-D	18	SRO-D	3