

| Facility: South Texas Project | | | | | | | | | | | | | | Date of Exam: December 4, 2009 | | | | | | | | | | | | | |
|---|------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|--------------------------------|----|-------|---|----|--|--|--|--|--|--|--|--|--|
| Tier | Group | RO K/A Category Points | | | | | | | | | | | | SRO-Only Points | | | | | | | | | | | | | |
| | | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G * | Total | A2 | G* | Total | | | | | | | | | | | |
| 1. Emergency & Abnormal Plant Evolutions | 1 | 3 | 3 | 3 | N/A | | | 4 | 2 | N/A | | | 3 | 18 | 3 | 3 | 6 | | | | | | | | | | |
| | 2 | 1 | 2 | 1 | | | | 2 | 2 | | | | 1 | 9 | 3 | 1 | 4 | | | | | | | | | | |
| | Tier Totals | | 4 | 5 | | | | 4 | 6 | | | | 4 | 4 | 27 | 6 | 4 | 10 | | | | | | | | | |
| | 2. Plant Systems | 1 | 3 | 1 | 4 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 28 | 3 | 2 | 5 | | | | | | | | | | |
| 2 | | 1 | 2 | 0 | 2 | 1 | 0 | 2 | 1 | 0 | 1 | 0 | 10 | 2 | 1 | 3 | | | | | | | | | | | |
| Tier Totals | | 4 | 3 | 4 | 5 | 3 | 3 | 4 | 3 | 3 | 3 | 38 | 5 | 3 | 8 | | | | | | | | | | | | |
| 3. Generic Knowledge and Abilities Categories | | 1 | | 2 | | 3 | | 4 | | 10 | | 1 | 2 | 3 | 4 | 7 | | | | | | | | | | | |
| | | 3 | | 2 | | 2 | | 3 | | | | 2 | 2 | 1 | 2 | | | | | | | | | | | | |
| <p>Note:</p> <ol style="list-style-type: none"> Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two). The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ± 1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories. * The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43. | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| 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 | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
| 000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1 | | | | X | | S | EA1.08 – AFW System (S) 2.4.45 – Ability to prioritize and interpret the significance of each annunciator or alarm. | 4.4 4.3 | |
| 000008 Pressurizer Vapor Space Accident / 3 | | | | | | X | 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 | |
| 000009 Small Break LOCA / 3 | | | X | | | | EK3.03 – Reactor trip and safety injection. | 4.1 | |
| 000011 Large Break LOCA / 3 | | | | | | X | 2.4.6 – Knowledge of EOP mitigation strategies. | 3.7 | |
| 000015/17 RCP Malfunctions / 4 | | | | | | | | | |
| 000022 Loss of Rx Coolant Makeup / 2 | | | | | S | | (S) AA2.03 – Failures of flow control valve or controller. | 3.6 | |
| 000025 Loss of RHR System / 4 | | | | X | | S | AA1.11 – Reactor building sump level indicators. (S) 2.1.23 – Ability to perform specific system and integrated plant procedures during all modes of plant operation. | 2.9 4.4 | |
| 000026 Loss of Component Cooling Water / 8 | | | | | | | | | |
| 000027 Pressurizer Pressure Control System Malfunction / 3 | | | | X | | | AA1.03 – Pressure control when on a steam bubble. | 3.6 | |
| 000029 ATWS / 1 | | | | | | | | | |
| 000038 Steam Gen. Tube Rupture / 3 | | | X | | | | EK3.05 – Normal operating precautions to preclude or minimize SGTR. | 4.0 | |
| 000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4 | | | | | | X | 2.4.20 – Knowledge of the operational implications of EOP warnings, cautions, and notes. | 3.8 | |
| 000054 (CE/E06) Loss of Main Feedwater / 4 | X | | | | | S | AK1.01 – MFW line break depressurizes the S/G (similar to a steam line break). (S) 2.4.41 – Knowledge of the emergency action level thresholds and classifications. | 4.1 4.6 | |
| 000055 Station Blackout / 6 | X | | | | S | | EK1.02 – Natural circulation cooling. (S) EA2.05 – When battery is approaching fully discharged. | 4.1 3.7 | |
| 000056 Loss of Off-site Power / 6 | | | | | | | | | |
| 000057 Loss of Vital AC Inst. Bus / 6 | | | | | X | | AA2.06 – AC instrument bus alarms for the inverter and alternate power source. | 3.2 | |
| 000058 Loss of DC Power / 6 | X | | | | | | AK1.01 – Battery charger equipment and instrumentation. | 2.8 | |
| 000062 Loss of Nuclear Svc Water / 4 | | | | X | | | AA1.07 – Flow rates to the components and systems that are serviced by the SWS; interactions among the components. | 2.9 | |

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| 000065 Loss of Instrument Air / 8 | | | | | X | | AA2.05 – when to commence plant shutdown if instrument air pressure is decreasing. | 3.4* | |
| W/E04 LOCA Outside Containment / 3 | | X | | | | | EK2.01 – Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. | 3.5 | |
| W/E11 Loss of Emergency Coolant Recirc. / 4 | | X | | | | | EK2.02 – Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility. | 3.9 | |
| BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4 | | | X | | | | EK3.01 – Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics. | 3.4 | |
| 000077 Generator Voltage and Electric Grid Disturbances / 6 | | X | | | | S | AK2.07 – Turbine/generator control. (S) AA2.10 – Generator overheating and the required actions. | 3.6 3.8 | |
| | | | | | | | | | |
| K/A Category Totals: RO | 3 | 3 | 3 | 4 | 2 | 3 | Group Point Total: RO | | 18 |
| K/A Category Totals: SRO | | | | | 3 | 3 | Group Point Total: SRO | | 6 |

| ES-401 | | PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / SRO) | | | | | | Form ES-401-2 | |
|--|--------|--|--------|--------|--------|---|--|---------------|---|
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
| 000001 Continuous Rod Withdrawal / 1 | | | | | | | | | |
| 000003 Dropped Control Rod / 1 | | | X | | | | AK3.02 – Reactor runback with a dropped control rod. | 3.3* | |
| 000005 Inoperable/Stuck Control Rod / 1 | | | | | | | | | |
| 000024 Emergency Boration / 1 | | | | | | X | 2.2.37 – Ability to determine operability and/or availability of safety related equipment. | 3.6 | |
| 000028 Pressurizer Level Malfunction / 2 | | | | | | | | | |
| 000032 Loss of Source Range NI / 7 | | | | | S | | (S) AA2.09 – Effect of improper HV setting. | 2.9 | |
| 000033 Loss of Intermediate Range NI / 7 | | | | | | | | | |
| 000036 (BW/A08) Fuel Handling Accident / 8 | | | | | | | | | |
| 000037 Steam Generator Tube Leak / 3 | | | | X | | | AA1.11 – PZR level indicator | 3.4 | |
| 000051 Loss of Condenser Vacuum / 4 | | | | | S | | (S) AA2.02 – Conditions requiring reactor and/or turbine trip. | 4.1 | |
| 000059 Accidental Liquid RadWaste Rel. / 9 | | | | | | | | | |
| 000060 Accidental Gaseous Radwaste Rel. / 9 | | | | | | | | | |
| 000061 ARM System Alarms / 7 | | X | | | | | AK2.01 – Detectors at each ARM system location. | 2.5* | |
| 000067 Plant Fire On-site / 8 | | | | | | | | | |
| 000068 (BW/A06) Control Room Evac. / 8 | | | | X | | | AA1.30 – Operation of the letdown system | 3.4 | |
| 000069 (W/E14) Loss of CTMT Integrity / 5 | | | | | S | | (S) AA2.01 – Loss of containment integrity. | 4.3 | |
| 000074 (W/E06&E07) Inad. Core Cooling / 4 | | | | | | | | | |
| 000076 High Reactor Coolant Activity / 9 | | | | | X | | AA2.04 – Process effluent radiation chart recorder. | 2.6 | |
| W/E01 & E02 Rediagnosis & SI Termination / 3 | X | | | | | | W/E02 EK1.1 – Components, capacity, and function of emergency systems. | 3.2 | |
| W/E13 Steam Generator Over-pressure / 4 | | | | | | | | | |
| W/E15 Containment Flooding / 5 | | | | | X | | EA2.1 – Facility conditions and selection of appropriate procedures during abnormal and emergency operations. | 2.7 | |
| 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 - Depress. / 4 | | X | | | | | EK2.1 – Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. | 3.6 | |

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|---|---|---|---|---|---|---|---|-----|---|
| BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4 | | | | | | S | (S) 2.1.25 - Ability to interpret reference materials, such as graphs, curves, tables, etc. | 4.2 | |
| BW/E13&E14 EOP Rules and Enclosures | | | | | | | | | |
| CE/A11; W/E08 RCS Overcooling - PTS / 4 | | | | | | | | | |
| CE/A16 Excess RCS Leakage / 2 | | | | | | | | | |
| CE/E09 Functional Recovery | | | | | | | | | |
| K/A Category Point Totals: RO | 1 | 2 | 1 | 2 | 2 | 1 | Group Point Total: RO | | 9 |
| K/A Category Point Totals: SRO | | | | | 3 | 1 | Group Point Total: SRO | | 4 |

| ES-401 | | PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO / SRO) | | | | | | | | | | | Form ES-401-2 | | |
|--|--------|--|--------|--------|--------|--------|--------|--------|--------|--------|---|---|---------------|---|--|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # | |
| 003 Reactor Coolant Pump | | | X | | | | | | | | | K3.04 - RPS | 3.9 | | |
| 004 Chemical and Volume Control | | | | | | X | | | | | | K6.01 – Spray/heater combination in PZR to assure uniform boron concentration. | 3.1 | | |
| | | | | | | | | | | X | | A4.05 – Letdown pressure and temperature control valves. | 3.6 | | |
| | | | | | | | | | | | S | (S) 2.1.32 – Ability to explain and apply system limits and precautions. | 4.0 | | |
| 005 Residual Heat Removal | | | | | | | | X | | | | A2.01 – Failure modes for pressure, flow, pump motor amps, motor temperature, and tank level instrumentation. | 2.7 | | |
| | | | | | | | | | | | S | (S) 2.4.4 – Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures | 4.7 | | |
| 006 Emergency Core Cooling | | | | | X | | | | | | | K5.11 – Basic heat transfer equation. | 2.5 | | |
| | | | | | | | | X | | | | A2.10 – Low boron concentration in SIS. | 3.4 | | |
| 007 Pressurizer Relief/Quench Tank | | | X | | | | | | | | | K3.01 - Containment | 3.3 | | |
| 008 Component Cooling Water | X | | | | | | | | | | | K1.05 – Sources of makeup water. | 3.0 | | |
| | | | | | | | | S | | | | (S) A2.05 – Effect of loss of instrument and control air on the position of the CCW valves that are air operated. | 3.5 | | |
| 010 Pressurizer Pressure Control | | | | | | | | | | | X | 2.4.18 – Knowledge of the specific bases for EOP's | 3.3 | | |
| 012 Reactor Protection | | | | | | X | | | | | | K6.04 – Bypass-block circuits. | 3.3 | | |
| | | | | | | | | S | X | | | A3.02 – Bistables | 3.6 | | |
| | | | | | | | | | | | | (S) A2.07 – Loss of DC control power. | 3.7 | | |
| 013 Engineered Safety Features Actuation | | | | X | | | | | | | | K4.03 – Main Steam isolation signal. | 3.9 | | |
| 022 Containment Cooling | | | | | | | X | | | | | A1.01 – Containment temperature | 3.6 | | |
| 025 Ice Condenser | | | | | | | | | | | | | | | |
| 026 Containment Spray | | | | | | | | | X | | | A3.01 – Pump starts and correct MOV positioning. | 4.3 | | |
| 039 Main and Reheat Steam | | | | X | | | | | | | | K4.08 – Interlocks on MSIV and bypass valves. | 3.3 | | |

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|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|-------------|----|
| 059 Main Feedwater | | | | | | | | | | | | X | 2.4.49 – Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. | 4.6 | |
| 061 Auxiliary/Emergency Feedwater | | | | | X | | | | | | | | K5.03 – Pump head effects when control valve is shut. A1.05 – AFW flow/motor amps. | 2.6 3.6 | |
| 062 AC Electrical Distribution | | X | | | | | | | | | | X | K2.01 – Major system loads. 2.4.2 – Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. | 3.3 4.5 | |
| 063 DC Electrical Distribution | | | | | | | | | | | X | | A4.02 – Battery voltage indicator. | 2.8* | |
| 064 Emergency Diesel Generator | X | | | | | | | | | | | | K1.03 – Diesel fuel oil supply system. K6.07 – Air receivers. | 3.6 2.7 | |
| 073 Process Radiation Monitoring | | | X | | | | | | | | | | K3.01 – Radioactive effluent releases | 3.6 | |
| 076 Service Water | X | | | | | | | | | | X | | K1.20 – AFW. A3.02 – Emergency heat loads. | 3.4* 3.7 | |
| 078 Instrument Air | | | | X | | | | | | | | S | K4.02 – Cross-over to other air systems. (S) A2.01 – Air dryer and filter malfunctions | 3.2 2.9 | |
| 103 Containment | | | X | | | | | | | | | | K3.01 – Loss of containment integrity under shutdown conditions. | 3.3* | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| K/A Category Point Totals: RO | 3 | 1 | 4 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | | Group Point Total: RO | | 28 |
| K/A Category Point Totals: SRO | | | | | | | | 3 | | | 2 | | Group Point Total: SRO | | 5 |

| ES-401 PWR Examination Outline Plant Systems - Tier 2/Group 2 (RO / SRO) | | | | | | | | | | | | | | Form ES-401-2 | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|--|--|---------------|---|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | | IR | # |
| 001 Control Rod Drive | | | | | | | | | | X | | A4.06 – Control rod drive disconnect/connect. | | 2.9 | |
| 002 Reactor Coolant | | | | | X | | | | | | | K5.10 – Relationship between reactor power and RCS differential temperature. | | 3.6 | |
| 011 Pressurizer Level Control | | X | | | | | | | | | | K2.02 – Knowledge of bus power supplies to PZR heaters. | | 3.1 | |
| | | | | | | | | S | | | | (S) A2.12 – Operation of auxiliary spray. | | 3.3 | |
| 014 Rod Position Indication | | | | X | | | | | | | | K4.03 – Rod bottom lights. | | 3.2 | |
| 015 Nuclear Instrumentation | | X | | | | | | | | | | K2.01 - Knowledge of bus power supplies to NIS channels, components, and interconnections. | | 3.3 | |
| 016 Non-nuclear Instrumentation | | | | | | | | | | | | | | | |
| 017 In-core Temperature Monitor | | | | | | | | | | | | | | | |
| 027 Containment Iodine Removal | | | | | | | | | | | | | | | |
| 028 Hydrogen Recombiner and Purge Control | | | | | | | | | | | | | | | |
| 029 Containment Purge | | | | | | | | | | | | | | | |
| 033 Spent Fuel Pool Cooling | | | | | | | | S | | | | (S) A2.02 – Loss of SFPCS | | 3.0 | |
| 034 Fuel Handling Equipment | | | | | | | | | | | | | | | |
| 035 Steam Generator | | | | | | | | | | | | | | | |
| 041 Steam Dump/Turbine Bypass Control | | | | | | | | | X | | | A3.05 – Ability to monitor automatic operation of the SDS, including main steam pressure. | | 2.9* | |
| 045 Main Turbine Generator | X | | | | | | | | | | | K1.18 – Knowledge of the physical connections and/or cause-effect relationships between the MT/G system and RPS. | | 3.6 | |
| 055 Condenser Air Removal | | | | | | | | | | | | | | | |
| 056 Condensate | | | | | | | | | | | | | | | |
| 068 Liquid Radwaste | | | | X | | | | | | | | K4.01 – Safety and environmental precautions for handling hot, acidic, and radioactive liquids. | | 3.4 | |
| 071 Waste Gas Disposal | | | | | | | | X | | | | A2.05 – Power failure to the ARM and PRM systems. | | 2.5* | |
| 072 Area Radiation Monitoring | | | | | | | | | | | S | (S) 2.4.30 – Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. | | 4.1 | |

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|--------------------------------|---|---|---|---|---|---|---|---|---|---|---|-----------------------|------------------------|---|-----|--|--|--|----|---|
| 075 Circulating Water | | | | | | | | | | | | | | | | | | | | |
| 079 Station Air | | | | | | | | | | | | | | | | | | | | |
| 086 Fire Protection | | | | | | | | X | | | | | | A1.05 – Fire protection system lineups. | 2.9 | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| K/A Category Point Totals: RO | 1 | 2 | 0 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | Group Point Total: RO | | | | | | | 10 | |
| K/A Category Point Totals: SRO | | | | | | | | | 2 | | | 1 | Group Point Total: SRO | | | | | | | 3 |

| Facility: | | Date of Exam: | | | | |
|-----------------------------|----------|---|------|---|----------|---|
| Category | K/A # | Topic | RO | | SRO-Only | |
| | | | IR | # | IR | # |
| 1. Conduct of Operations | 2.1.7 | Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. | 4.4 | | | |
| | 2.1.21 | Ability to verify the controlled procedure copy. | 3.5* | | | |
| | 2.1.44 | Knowledge of RO duties in the control room during fuel handling, such as responding to alarms from the fuel handling area, communication with the fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation. | 3.9 | | | |
| | 2.1.36 | (S) Knowledge of procedures and limitations involved in core alterations. | | | 4.1 | |
| | 2.1.4 | (S) Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc. | | | 3.8 | |
| | 2.1. | | | | | |
| | Subtotal | | 3 | | 2 | |
| 2. Equipment Control | 2.2.40 | Ability to apply Technical Specifications for a system. | 3.4 | | | |
| | 2.2.35 | Ability to determine Technical Specification Mode of Operation | 3.6 | | | |
| | 2.2.5 | (S) Knowledge of the process for making design or operating changes to the facility. | | | 3.2 | |
| | 2.2.17 | (S) Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator. | | | 3.8 | |
| | 2.2. | | | | | |
| | 2.2. | | | | | |
| | Subtotal | | 2 | | 2 | |
| 3. Radiation Control | 2.3.13 | Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. | 3.4 | | | |
| | 2.3.14 | Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. | 3.4 | | | |
| | 2.3.11 | (S) Ability to control radiation releases. | | | 4.3 | |
| | 2.3. | | | | | |
| | 2.3. | | | | | |
| | 2.3. | | | | | |
| | Subtotal | | 2 | | 1 | |
| 4. Emergency | 2.4.9 | Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies. | 3.8 | | | |
| | 2.4.13 | Knowledge of crew roles and responsibilities during EOP usage. | 4.0 | | | |

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| Procedures / Plan | 2.4.31 | Knowledge of annunciator alarms, indications, or response procedures. | 4.2 | | | |
| | 2.4.27 | (S) Knowledge of “fire in the plant” procedures. | | | 3.9 | |
| | 2.4.38 | (S) Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required. | | | 4.4 | |
| | 2.4. | | | | | |
| | Subtotal | | 3 | | 2 | |
| Tier 3 Point Total | | | 10 | 10 | 7 | 7 |

[illegible]

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

| Facility: South Texas Project Examination Level: RO | | Date of Examination: 12/7/2009 Operating Test Number: LOT-17 (NRC) |
|--|---------------|---|
| Administrative Topic (see Note) | Type Code* | Describe activity to be performed |
| (A1) Conduct of Operations | R, N | Perform ESF Power Availability Surveillance. 2.1.20 (4.6) Ability to interpret and execute procedure steps |
| (A2) Conduct of Operations | R, M, P | Determine Dilution/Boration for Power Increase and Decrease 2.1.7 (4.4) Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation |
| (A3) Equipment Control | R, N | Prepare Revision to Equipment Clearance Order 2.2.13 (4.1) Knowledge of tagging and clearance procedures |
| (A4) Radiation Control | R, N | Stay Time Determination with Entry Requirements 2.3.4 (3.2) Knowledge of radiation exposure limits under normal or emergency conditions |
| Emergency Procedures/Plan | | |
| NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required. | | |
| * Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected) | | |

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

| Facility: South Texas Project Examination Level: SRO | | Date of Examination: 12/7/2009 Operating Test Number: LOT-17 (NRC) |
|--|---------------|---|
| Administrative Topic (see Note) | Type Code* | Describe activity to be performed |
| (A5) Conduct of Operations | R, N | Perform a Shutdown Risk Assessment 2.1.23 (4.4) Ability to perform specific system and integrated plant procedures during all modes of plant operation |
| (A6) Conduct of Operations | R, N | Determine Shift Staffing 2.1.5 (3.9) Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc. |
| (A7) Equipment Control | R, N | Review Completed Surveillance. 2.2.40 (4.7) Ability to apply Technical Specifications for a system |
| (A8) Radiation Control | R, N | Determine Personnel Exposure Limits 2.3.4 (3.7) Knowledge of radiation exposure limits under normal and emergency conditions |
| (A9) Emergency Procedures/Plans | S, N | Classify an Emergency Event 2.4.41 (4.6) Knowledge of emergency action level thresholds and classifications |
| NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required. | | |
| * Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1; randomly selected) | | |

| | | |
|---|---|---|
| Facility: South Texas Project Examination Level: RO | | Date of Examination: 12/7/2009 Operating Test Number: LOT-17 (NRC) |
| Control Room Systems [@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF) | | |
| System / JPM Title | Type Code* | Safety Function |
| (S1) 004 / Perform Emergency Boration of RCS | S, N, A | 1 |
| (S2) 006 / Lower Safety Injection Accumulator Level | S, N, EN | 2 |
| (S3) 010 / Depressurize RCS During Steam Generator Tube Rupture | S, N, A, E, L | 3 |
| (S4) 003 / Start a Reactor Coolant Pump | S, N, A, L | 4P |
| (S5) 026 / Perform Containment Spray Pump Test | S, N, A | 5 |
| (S6) 064 / Restore Offsite Power to ESF Bus | S, N, EN | 6 |
| (S7) 015 / Bypass a Failed Power Range Channel | S, N | 7 |
| (S8) 008 / Start CCW Train | S, N | 8 |
| In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U) | | |
| (P1) EPE-038 / Perform Addendum 8 Secondary Contamination Control | N, E, L | 9 |
| (P2) APE-068 / Actions at Auxiliary Shutdown Panel for Control Room Evacuation | N, A | 3 |
| (P3) EPE-055 / Locally Re-Align Charging Pump Suction from the VCT to the RWST | N, E, L, R | 2 |
| @ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room. | | |
| * Type Codes | Criteria for RO / SRO-I / SRO-U | |
| (A)lternate path (C)ontrol room (D)irect from bank (E)mergency or abnormal in-plant (EN)gineered safety feature (L)ow-Power / Shutdown (N)ew or (M)odified from bank including 1(A) (P)revious 2 exams (R)CA (S)imulator | 4-6 / 4-6 / 2-3 $\leq 9 / \leq 8 / \leq 4$ $\geq 1 / \geq 1 / \geq 1$ - / / ≥ 1 (control room system) $\geq 1 / \geq 1 / \geq 1$ $\geq 2 / \geq 2 / \geq 1$ $\leq 3 / \leq 3 / \leq 2$ (randomly selected) $\geq 1 / \geq 1 / \geq 1$ | |

| | | |
|--|---|---|
| Facility: South Texas Project Examination Level: SRO - Instant | | Date of Examination: 12/7/2009 Operating Test Number: LOT-17 (NRC) |
| Control Room Systems [@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF) | | |
| System / JPM Title | Type Code* | Safety Function |
| (S1) 004 / Perform Emergency Boration of RCS | S, N, A | 1 |
| (S2) 006 / Lower Safety Injection Accumulator Level | S, N, EN | 2 |
| | | |
| (S4) 003 / Start a Reactor Coolant Pump | S, N, A, L | 4P |
| (S5) 026 / Perform Containment Spray Pump Test | S, N, A | 5 |
| (S6) 064 / Restore Offsite Power to ESF Bus | S, N, EN | 6 |
| (S7) 015 / Bypass a Failed Power Range Channel | S, N | 7 |
| (S8) 008 / Start CCW Train | S, N | 8 |
| In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U) | | |
| (P1) EPE-038 / Perform Addendum 8 Secondary Contamination Control | N, E, L | 9 |
| (P2) APE-068 / Actions at Auxiliary Shutdown Panel for Control Room Evacuation | N, A | 3 |
| (P3) EPE-055 / Locally Re-Align Charging Pump Suction from the VCT to the RWST | N, E, L, R | 2 |
| <p>@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p> | | |
| * Type Codes | Criteria for RO / SRO-I / SRO-U | |
| (A)lternate path (C)ontrol room (D)irect from bank (E)mergency or abnormal in-plant (EN)gineered safety feature (L)ow-Power / Shutdown (N)ew or (M)odified from bank including 1(A) (P)revious 2 exams (R)CA (S)imulator | 4-6 / 4-6 / 2-3 $\leq 9 / \leq 8 / \leq 4$ $\geq 1 / \geq 1 / \geq 1$ - / / ≥ 1 (control room system) $\geq 1 / \geq 1 / \geq 1$ $\geq 2 / \geq 2 / \geq 1$ $\leq 3 / \leq 3 / \leq 2$ (randomly selected) $\geq 1 / \geq 1 / \geq 1$ | |

| | | |
|--|---|---|
| Facility: South Texas Project Examination Level: SRO - Upgrade | | Date of Examination: 12/7/2009 Operating Test Number: LOT-17 (NRC) |
| Control Room Systems [@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF) | | |
| System / JPM Title | Type Code* | Safety Function |
| (S1) 004 / Perform Emergency Boration of RCS | S, N, A | 1 |
| | | |
| | | |
| | | |
| (S5) 026 / Perform Containment Spray Pump Test | S, N, A | 5 |
| (S6) 064 / Restore Offsite Power to ESF Bus | S, N, EN | 6 |
| | | |
| | | |
| In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U) | | |
| (P1) EPE-038 / Perform Addendum 8 Secondary Contamination Control | N, E, L | 9 |
| | | |
| (P3) EPE-055 / Locally Re-Align Charging Pump Suction from the VCT to the RWST | N, E, L, R | 2 |
| <p>@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p> | | |
| * Type Codes | Criteria for RO / SRO-I / SRO-U | |
| (A)lternate path (C)ontrol room (D)irect from bank (E)mergency or abnormal in-plant (EN)gineered safety feature (L)ow-Power / Shutdown (N)ew or (M)odified from bank including 1(A) (P)revious 2 exams (R)CA (S)imulator | <p>4-6 / 4-6 / 2-3</p> <p>$\leq 9 / \leq 8 / \leq 4$ $\geq 1 / \geq 1 / \geq 1$ - / / ≥ 1 (control room system) $\geq 1 / \geq 1 / \geq 1$ $\geq 2 / \geq 2 / \geq 1$ $\leq 3 / \leq 3 / \leq 2$ (randomly selected) $\geq 1 / \geq 1 / \geq 1$</p> | |

INITIAL LICENSE EXAM

OPERATING TEST #1

SCENARIO #1

MODIFIED

Revision # 2

Week of 12/7/2009

NOTE: THIS SCENARIO REQUIRES INSTRUCTOR CUES

SCENARIO OUTLINE

Facility: STP
NRC Exam Scenario No.: 1
Op-Test No.: 1

Initial Conditions: 100% MOL; 913 ppm boron

Turnover: Emergency Diesel Generator #11 has been out of service 38 hours for planned routine maintenance. Work is scheduled to be complete in approximately 22 hours.

Surveillance Requirement 4.8.1.1.1.a is due in approximately 7 hours. Decrease Letdown flow by placing the 85-100 gpm orifice in service.

| Event No. | Malf. No. | Event Type* | Event Description |
|---------------|-----------------------------------|------------------------------|--|
| 1 (10 min) | N/A | SRO (N) RO (N) | Swap from the 120-150 gpm Letdown Orifice to the 85-100 gpm Letdown Orifice. |
| 2 (25 min) | 05-12-03 (0) | SRO (I) BOP (I) | SG 'C' Controlling Level Channel LT-539 Fails Low (Tech Spec) |
| 3 (33min) | 06-16-02 (0) | SRO (I) RO (I) BOP (I) | Turbine Impulse Channel PT-505 Fails Low (Tech Spec) |
| 4 (45 min) | 06-19-05 (0.3) | SRO (C) BOP (C) RO (R) | High Vibration on Main Turbine Bearing #5 Resulting in Down Power (Will require manual cues) |
| 5 (75 min) | MS-18 (1) 05-01-01 (0.5) | SRO (M) BOP (M) RO (M) | Steam Line Rupture in Turbine Building with Failure of "B" Main Steam Isolation Valve to close |
| 6 (NA) | 01-35-02 (True) | SRO (C) RO (C) | Intermediate Range Nuclear Instrument NI-0036 is under compensated (Becomes evident after the Reactor Trip) (Integral to Scenario) (Tech Spec) |
| 7 (NA) | 50-AF-03 (True) | SRO (C) BOP (C) RO (C) | Failure of AFW Pump #13 (Integral to Scenario) |

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

INITIAL LICENSE EXAM

NRC OPERATING TEST # 1

SCENARIO # 2

Revision # 2

Week of 12/7/2009

SCENARIO OUTLINE

Facility: STP

NRC Exam Scenario No.: 2

Op-Test No.: 1

Initial Conditions: 3% MOL; 1500 ppm boron

Turnover: Continue with the plant startup. Currently at Step 6.2 of 0POP03-ZG-0005, Plant Startup to 100%. Condensate Pump #12 and Feedwater Booster Pump #11 are OOS for corrective maintenance.

| Event No. | Malf. No. | Event Type* | Event Description |
|---------------|-------------------------|------------------------------|--|
| 1 (18 min) | N/A | SRO (N) RO (R) BOP (N) | Raise power to between 6 and 8% |
| 2 (28 min) | 10-12-02 (True) | SRO (C) BOP (C) RO (C) | Loss of MCC E1A2 (Tech Spec) |
| 3 (35 min) | Rose Dwg SAP 013S | SRO (C) BOP (C) | Steam Dump Valve PV-7496 fails open |
| 4 (50 min) | 02-19-03 (1) | SRO (I) RO (I) | Pressurizer Pressure PT-457 fails high. PORV PCV-0655A does not fully re-seat after opening. (Tech Spec) |
| 5 (NA) | 02-13-01 (0.5) | SRO (C) RO (C) | Pressurizer PORV 0655A fails to fully close (integral to the scenario) |
| 6 (80 min) | 50-HV-01 (1) | SRO (M) BOP (M) RO (M) | PZR PORV PCV-0655A fails open |
| 7 (NA) | 04-09-08 (1) | SRO (C) BOP (C) | Essential Chiller 12A fails to start. (integral to the scenario) |

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

INITIAL LICENSE EXAM

OPERATING TEST # 1

SCENARIO #4

Revision 2

Week of 12/7/2009

| Facility: STP | | Scenario No.: 4 | | Op-Test No.: 1 | |
|--|-----------------------------|------------------------------|--|----------------|--|
| Initial Conditions: 75% MOL; 967 ppm boron | | | | | |
| Turnover: Maintain current power. 'B' Train LHSI and HHSI pumps are OOS for maintenance. | | | | | |
| Event No. | Malf. No. | Event Type* | Event Description | | |
| 1 (14 min) | 02-28-02 (1.0) | SRO (I) RO (I) | Loop 'D' T-cold fails high. (Tech Spec) | | |
| 2 (27 min) | 05-22-02 (0.0) | SRO (I) BOP (I) | Controlling Steam Pressure channel on 'B' Steam Generator fails low. (Tech Spec) | | |
| 3 (42 min) | 03-12-01 (0.25) | SRO (C) RO (C) | Letdown leak outside containment. | | |
| 4 (49 min) | 08-10-01 (0.65) | SRO (N) BOP (N) | Loss of SGFPT # 11 Speed Control | | |
| 5 (76 min) | 02-01-03 (0.3) | SRO (M) BOP (M) RO (M) | Large Break LOCA on Loop 'C' cold leg occurs (integral to scenario, occurs 5-10 sec after C-7 is reset). | | |
| 6 (NA) | 04-09-02 (True) | SRO (C) BOP (C) | Essential Cooling Water Pump 1B trips after the SI. (triggered during Phase A isolation verification) | | |
| 7 (NA) | 01-12-03 A/B/C (True) | SRO (C) RO (C) | All Trains of Safety Injection fail to automatically actuate. (integral to the scenario) | | |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor | | | | | |

SCENARIO MISCELLANEOUS INFORMATION