

| Facility: <u>South Texas Project</u> | | Date of Exam: <u>09-26-2013</u> | | | | | | | | | | | | | | | | |
|---|-------------|---------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------------|----|----|-------|----|---|
| 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 | | | 3 | 3 | N/A | | | 3 | 18 | 3 | 3 | 6 | |
| | 2 | 1 | 1 | 2 | N/A | | | 2 | 2 | N/A | | | 1 | 9 | 2 | 2 | 4 | |
| | Tier Totals | 4 | 4 | 5 | N/A | | | 5 | 5 | N/A | | | 4 | 27 | 5 | 5 | 10 | |
| 2. Plant Systems | 1 | 4 | 2 | 2 | 1 | 2 | 2 | 2 | 5 | 4 | 2 | 2 | 28 | 3 | 2 | 5 | | |
| | 2 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 10 | 0 | 1 | 2 | 3 | |
| | Tier Totals | 6 | 2 | 3 | 2 | 3 | 3 | 3 | 5 | 5 | 3 | 3 | 38 | 4 | 4 | 8 | | |
| 3. Generic Knowledge and Abilities Categories | | | | 1 | | 2 | | 3 | | 4 | | 10 | | 1 | 2 | 3 | 4 | 7 |
| | | | | 3 | | 2 | | 3 | | 2 | | | | 1 | 2 | 2 | 2 | |

Note:

- Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
- 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) | | | | | | 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 | | | | | Knowledge of the interrelations between a reactor trip and the following: (CFR 41.7 / 45.7) EK2.02 Breakers, relays and disconnects | 2.6 | 1 |
| 000008 Pressurizer Vapor Space Accident / 3 | | | | | X | | Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: (CFR: 43.5 / 45.13) AA2.25 Expected leak rate from open PORV or code safety | 2.8 | 2 |
| 000009 Small Break LOCA / 3 | | | | | | X | 2.2.38 Knowledge of conditions and limitations in the facility license. (CFR: 41.7 / 41.10 / 43.1 / 45.13) | 3.6 | 3 |
| 000011 Large Break LOCA / 3 | | | | | X | | Ability to determine or interpret the following as they apply to a Large Break LOCA: (CFR 43.5 / 45.13) EA2.09 Existence of adequate natural circulation | 4.2 | 4 |
| 000015/17 RCP Malfunctions / 4 | | | | X | | | Ability to operate and / or monitor the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): (CFR 41.7 / 45.5 / 45.6) AA1.02 RCP oil reservoir level and alarm indicators | 2.8 | 5 |
| 000022 Loss of Rx Coolant Makeup / 2 | | | | | | | | | |
| 000025 Loss of RHR System / 4 | X | | | | | | Knowledge of the operational implications of the following concepts as they apply to Loss of Residual Heat Removal System: (CFR 41.8 / 41.10 / 45.3) AK1.01 Loss of RHRS during all modes of operation | 3.9 | 6 |
| 000026 Loss of Component Cooling Water / 8 | | | | X | | | Ability to operate and / or monitor the following as they apply to the Loss of Component Cooling Water: (CFR 41.7 / 45.5 / 45.6) AA1.06 Control of flow rates to components cooled by the CCWS | 2.9 | 7 |

| ES-401 | | PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO) | | | | | | 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 | # |
| 000027 Pressurizer Pressure Control System Malfunction / 3 | X | | | | | | Knowledge of the operational implications of the following concepts as they apply to Pressurizer Pressure Control Malfunctions: (CFR 41.8 / 41.10 / 45.3) AK1.03 Latent heat of vaporization/condensation | 2.6 | 8 |
| 000029 ATWS / 1 | | X | | | | | Knowledge of the interrelations between components following an ATWS: (CFR 41.7 / 45.7) EK2.06 Breakers, relays, and disconnects | 2.9 | 9 |
| 000038 Steam Gen. Tube Rupture / 3 | | | | | | | | | |
| 000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4 | | | X | | | | Knowledge of the reasons for the following responses as they apply to the Steam Line Rupture: (CFR 41.5,41.10 / 45.6 / 45.13) AK3.06 Containment temperature and pressure considerations | 3.4 | 10 |
| 000054 (CE/E06) Loss of Main Feedwater / 4 | | | | | | | | | |
| 000055 Station Blackout / 6 | | | X | | | | Knowledge of the reasons for the following responses as they apply to the Station Blackout: (CFR 41.5 / 41.10 / 45.6 / 45.13) EK3.02 Actions contained in EOP for loss of offsite and onsite power | 4.3 | 11 |
| 000056 Loss of Off-site Power / 6 | | | | | X | | Ability to determine and interpret the following as they apply to the Loss of Offsite Power: (CFR: 43.5 / 45.13) AA2.17 Operational status of PZR backup heaters | 3.4 | 12 |
| 000057 Loss of Vital AC Inst. Bus / 6 | | | | | | | | | |
| 000058 Loss of DC Power / 6 | | | | X | | | Ability to operate and / or monitor the following as they apply to the Loss of DC Power: (CFR 41.7 / 45.5 / 45.6) AA1.03 Vital and battery bus components | 3.1 | 13 |

| ES-401 | | PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO) | | | | | | 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 | # |
| 000062 Loss of Nuclear Svc Water / 4 | | | X | | | | Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water: (CFR 41.4, 41.8 / 45.7) AK3.02 The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS | 3.6 | 14 |
| 000065 Loss of Instrument Air / 8 | | | | | | X | 2.4.11 Knowledge of abnormal condition procedures. (CFR: 41.10 / 43.5 / 45.13) | 4.0 | 15 |
| W/E04 LOCA Outside Containment / 3 | | | | | | | | | |
| W/E11 Loss of Emergency Coolant Recirc. / 4 | | | | | | X | 2.4.20 Knowledge of the operational implications of EOP warnings, cautions, and notes. (CFR: 41.10 / 43.5 / 45.13) | 3.8 | 16 |
| BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4 | | X | | | | | Knowledge of the interrelations between the (Loss of Secondary Heat Sink) and the following: (CFR: 41.7 / 45.7) Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. | 3.7 | 17 |
| 000077 Generator Voltage and Electric Grid Disturbances / 6 | X | | | | | | Knowledge of the operational implications of the following concepts as they apply to Generator Voltage and Electric Grid Disturbances: (CFR: 41.4, 41.5, 41.7, 41.10 / 45.8) AK1.02 Over-excitation | 3.3 | 18 |
| K/A Category Totals: | 3 | 3 | 3 | 3 | 3 | 3 | Group Point Total: | | 18 |

| ES-401 | | PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO) | | | | | | 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 | | | | | | | | | |
| 000005 Inoperable/Stuck Control Rod / 1 | | | | | | | | | |
| 000024 Emergency Boration / 1 | | | X | | | | Knowledge of the reasons for the following responses as they apply to Emergency Boration: (CFR 41.5, 41.10 / 45.6 / 45.13) AK3.01 When emergency boration is required | 4.1 | 19 |
| 000028 Pressurizer Level Malfunction / 2 | | | | | | | | | |
| 000032 Loss of Source Range NI / 7 | | | | | | | | | |
| 000033 Loss of Intermediate Range NI / 7 | | | | | X | | Ability to determine and interpret the following as they apply to the Loss of Intermediate Range Nuclear Instrumentation: (CFR: 43.5 / 45.13) AA2.11 Loss of compensating voltage | 3.1 | 20 |
| 000036 (BW/A08) Fuel Handling Accident / 8 | X | | | | | | Knowledge of the operational implications of the following concepts as they apply to Fuel Handling Incidents : CFR 41.8 / 41.10 / 45.3) AK1.02 SDM | 3.4 | 21 |
| 000037 Steam Generator Tube Leak / 3 | | | | | | | | | |
| 000051 Loss of Condenser Vacuum / 4 | | | | | | | | | |
| 000059 Accidental Liquid RadWaste Rel. / 9 | | | | X | | | Ability to operate and / or monitor the following as they apply to the Accidental Liquid Radwaste Release: (CFR 41.7 / 45.5 / 45.6) AA1.01 Radioactive-liquid monitor | 3.5 | 22 |
| 000060 Accidental Gaseous Radwaste Rel. / 9 | | | | | | | | | |
| 000061 ARM System Alarms / 7 | | | | | | | | | |
| 000067 Plant Fire On-site / 8 | | | | | | | | | |
| 000068 (BW/A06) Control Room Evac. / 8 | | | | | | | | | |
| 000069 (W/E14) Loss of CTMT Integrity / 5 | | X | | | | | Knowledge of the interrelations between the Loss of Containment Integrity and the following: (CFR 41.7 / 45.7) AK2.03 Personnel access hatch and emergency access hatch | 2.8 | 23 |

| ES-401 | PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO) | | | | | | 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 | # |
| CE/E09 Functional Recovery | | | | | | | | | |
| K/A Category Point Totals: | 1 | 1 | 2 | 2 | 2 | 1 | Group Point Total: | | 9 |

| ES-401 | PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO) | | | | | | | | | | | 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 | | | | | | | Knowledge of the operational implications of the following concepts as they apply to the RCPS: (CFR: 41.5 / 45.7) K5.02 Effects of RCP coastdown on RCS parameters | 2.8 | 28 |
| 004 Chemical and Volume Control | | | | | | X | | | | | | Knowledge of the effect of a loss or malfunction on the following CVCS components: (CFR: 41.7 / 45.7) K6.17 Flow paths for emergency boration | 4.4 | 29 |
| 005 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: (CFR: 41.5 / 43.5 / 45.3 / 45.13) A2.04 RHR valve malfunction | 2.9 | 30 |
| 006 Emergency Core Cooling | X | | | | | | | | | | | Knowledge of the physical connections and/or causeeffect relationships between the ECCS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.03 RCS | 4.2 | 31 |
| 007 Pressurizer Relief/Quench Tank | | | | | | | | | | X | | Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.10 Recognition of leaking PORV/code safety | 3.6 | 32 |

| ES-401 | PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO) | | | | | | | | | | | 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 | # |
| 008 Component Cooling Water | | | | | | | | | X | | | Ability to monitor automatic operation of the CCWS, including: (CFR: 41.7 / 45.5) A3.03 All flow rate indications and the ability to evaluate the performance of this closed-cycle cooling system | 3.0 | 33 |
| 010 Pressurizer Pressure Control | | X | | | | | | | | | | Knowledge of bus power supplies to the following: (CFR: 41.7) K2.01 PZR heaters | 3.0 | 34 |
| 012 Reactor Protection | | | X | | | | | | | | | Knowledge of the effect that a loss or malfunction of the RPS will have on the following: (CFR: 41.7 / 45.6) K3.01 CRDS | 3.9 | 35 |
| 013 Engineered Safety Features Actuation | | | | | | | | | | X | | 2.1.32 Ability to explain and apply system limits and precautions. (CFR: 41.10 / 43.2 / 45.12) | 3.8 | 36 |
| 022 Containment Cooling | | | | | | | X | | | | | Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CCS controls including: (CFR: 41.5 / 45.5) A1.03 Containment humidity | 3.1 | 37 |
| 025 Ice Condenser | | | | | | | | | | | | | | |
| 026 Containment Spray | | | | X | | | | | | | | Knowledge of CSS design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) K4.02 Neutralized boric acid to reduce corrosion and remove inorganic fission product iodine from steam (NAOH) in containment spray | 3.1 | 38 |

| ES-401 | PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO) | | | | | | | | | | | 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 | # |
| 039 Main and Reheat Steam | | | | | X | | | | | | | Knowledge of the operational implications of the following concepts as the apply to the MRSS: (CFR: 441.5 / 45.7) K5.05 Bases for RCS cooldown limits | 2.7 | 39 |
| 059 Main Feedwater | | | | | | | | X | | | | Ability to (a) predict the impacts of the following malfunctions or operations on the MFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) A2.04 Feeding a dry S/G | 2.9 | 40 |
| 061 Auxiliary/Emergency Feedwater | | | | | | X | | | | | | Knowledge of the effect of a loss or malfunction of the following will have on the AFW components: (CFR: 41.7 / 45.7) K6.02 Pumps | 2.6 | 41 |
| 062 AC Electrical Distribution | X | | | | | | | | | | | Knowledge of the physical connections and/or causeeffect relationships between the ac distribution system and the following systems: (CFR: 41.2 to 41.9) K1.03 DC distribution | 3.5 | 42 |
| 063 DC Electrical Distribution | | | | | | | | | | X | | Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.03 Battery discharge rate | 3.0 | 43 |
| 064 Emergency Diesel Generator | | X | | | | | | | | | | Knowledge of bus power supplies to the following: (CFR: 41.7) K2.03 Control power | 3.2 | 44 |

| ES-401 | PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO) | | | | | | | | | | | 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 | # |
| 073 Process Radiation Monitoring | | | X | | | | | | | | | <p>Knowledge of the effect that a loss or malfunction of the PRM system will have on the following:</p> <p>(CFR: 41.7 / 45.6)</p> <p>K3.01 Radioactive effluent releases</p> | 3.6 | 45 |
| 076 Service Water | | | | | | | | X | | | | <p>Ability to (a) predict the impacts of the following malfunctions or operations on the SWS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:</p> <p>(CFR: 41.5 / 43.5 / 45/3 / 45/13)</p> <p>A2.01 Loss of SWS</p> | 3.5 | 46 |
| 078 Instrument Air | X | | | | | | | | | | | <p>Knowledge of the physical connections and/or cause-effect relationships between the IAS and the following systems:</p> <p>(CFR: 41.2 to 41.9 / 45.7 to 45.8)</p> <p>K1.02 Service air</p> | 2.7 | 47 |
| 103 Containment | | | | | | | | | X | | | <p>Ability to monitor automatic operation of the containment system, including:</p> <p>(CFR: 41.7 / 45.5)</p> <p>A3.01 Containment isolation</p> | 3.9 | 48 |
| 003 Reactor Coolant Pump | | | | | | | X | | | | | <p>Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPS controls including:</p> <p>(CFR: 41.5 / 45.5)</p> <p>A1.02 RCP pump and motor bearing temperatures</p> | 2.9 | 49 |

| ES-401 | PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO) | | | | | | | | | | | 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 | # |
| 004 Chemical and Volume Control | | | | | | | | | X | | | Ability to monitor automatic operation of the CVCS, including: (CFR: 41.7 / 45.5) A3.15 PZR pressure and temperature | 3.8 | 50 |
| 012 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: (CFR: 41.5 / 43.5 / 45.3 / 45.5) A2.02 Loss of instrument power | 3.6 | 51 |
| 061 Auxiliary/Emergency Feedwater | X | | | | | | | | | | | Knowledge of the physical connections and/or causeeffect relationships between the AFW and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.04 RCS | 3.9 | 52 |
| 064 Emergency Diesel Generator | | | | | | | | | | X | | 2.4.34 Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects. (CFR: 41.10 / 43.5 / 45.13) | 4.2 | 53 |
| 078 Instrument Air | | | | | | | | | X | | | Ability to monitor automatic operation of the IAS, including: (CFR: 41.7 / 45.5) A3.01 Air pressure | 3.1 | 54 |
| 006 Emergency Core Cooling | | | | | | | | X | | | | Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 45.5) A2.11 Rupture of ECCS header | 4.0 | 55 |
| K/A Category Point Totals | 4 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 5 | 4 | 2 | 2 | Group Point Total | 28 |

| ES-401 | PWR Examination Outline Plant Systems - Tier 2/Group 2 (RO) | | | | | | | | | | | 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 | | | | | | | | | | | | | | |
| 002 Reactor Coolant | | | | X | | | | | | | | Knowledge of RCS design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) K4.10 Overpressure protection | 4.2 | 56 |
| 011 Pressurizer Level Control | | | | | | | | | | | | | | |
| 014 Rod Position Indication | | | | | X | | | | | | | Knowledge of the operational implications of the following concepts as they apply to the RPIS: (CFR: 41.5 / 45.7) K5.01 Reasons for differences between RPIS and step counter | 2.7 | 57 |
| 015 Nuclear Instrumentation | | | | | | | | | X | | | Ability to monitor automatic operation of the NIS, including: (CFR: 41.7 / 45.5) A3.03 Verification of proper functioning/operability | 3.9 | 58 |
| 016 Non-nuclear Instrumentation | | | X | | | | | | | | | Knowledge of the effect that a loss or malfunction of the NNIS will have on the following: (CFR: 41.7 / 45.6) K3.06 AFW system | 3.5 | 59 |
| 017 In-core Temperature Monitor | X | | | | | | | | | | | Knowledge of the physical connections and/or causeeffect relationships between the ITM system and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.02 RCS | 3.3 | 60 |
| 027 Containment Iodine Removal | | | | | | | | | | | | | | |
| 028 Hydrogen Recombiner and Purge Control | | | | | | | | | | | | | | |
| 029 Containment Purge | | | | | | | | | | | | | | |
| 033 Spent Fuel Pool Cooling | | | | | | | | | | | X | 2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. (CFR: 41.10 / 43.2 / 45.6) | 4.6 | 61 |

| ES-401 | PWR Examination Outline Plant Systems - Tier 2/Group 2 (RO) | | | | | | | | | | | 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 | # |
| 034 Fuel Handling Equipment | | | | | | | | | | | | | | |
| 035 Steam Generator | | | | | | | | | | | X | Ability to monitor automatic operation of the S/G including: (CFR: 41.7 / 45.5) A3.01 S/G water level control | 4.0 | 62 |
| 041 Steam Dump/Turbine Bypass Control | | | | | | | | | | | | | | |
| 045 Main Turbine Generator | | | | | | | X | | | | | Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MT/G system controls including: (CFR: 41.5 / 45.5) A1.06 Expected response of secondary plant parameters following T/G trip | 3.3 | 63 |
| 055 Condenser Air Removal | | | | | | | | | | | | | | |
| 056 Condensate | X | | | | | | | | | | | Knowledge of the physical connections and/or cause-effect relationships between the Condensate System and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.03 MFW | 2.6 | 64 |
| 068 Liquid Radwaste | | | | | | | | | | | | | | |
| 071 Waste Gas Disposal | | | | | | | | | | | | | | |
| 072 Area Radiation Monitoring | | | | | | | | | | | | | | |
| 075 Circulating Water | | | | | | | | | | | | | | |
| 079 Station Air | | | | | | | | | | | | | | |
| 086 Fire Protection | | | | | | X | | | | | | Knowledge of the effect of a loss or malfunction on the Fire Protection System following will have on the : (CFR: 41.7 / 45.7) K6.04 Fire, smoke, and heat detectors | 2.6 | 65 |
| K/A Category Point Totals: | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | Group Point Total: | | 10 |

| ES-401 | | PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (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 | # |
| 000057 Loss of Vital AC Inst. Bus / 6 | | | | | | X | 2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. (CFR: 41.10 / 43.2 / 45.6) | 4.4 | 80 |
| 000058 Loss of DC Power / 6 | | | | | | | | | |
| 000062 Loss of Nuclear Svc Water / 4 | | | | | | | | | |
| 000065 Loss of Instrument Air / 8 | | | | | | X | 2.1.32 Ability to explain and apply system limits and precautions. (CFR: 41.10 / 43.2 / 45.12) | 4.0 | 81 |
| W/E04 LOCA Outside Containment / 3 | | | | | | | | | |
| W/E11 Loss of Emergency Coolant Recirc. / 4 | | | | | | | | | |
| BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4 | | | | | | | | | |
| 000077 Generator Voltage and Electric Grid Disturbances / 6 | | | | | | | | | |
| K/A Category Totals: | | | | | 3 | 3 | Group Point Total: | | 6 |

| ES-401 | PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (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 | # |
| W/E13 Steam Generator Over-pressure / 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 - Depress. / 4 | | | | | | | | | |
| BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4 | | | | | | | | | |
| 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: | | | | | 2 | 2 | Group Point Total: | | 4 |

| ES-401 | PWR Examination Outline Plant Systems - Tier 2/Group 1 (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 | # |
| 059 Main Feedwater | | | | | | | | | | | | | | |
| 061 Auxiliary/Emergency Feedwater | | | | | | | | | | | | | | |
| 062 AC Electrical Distribution | | | | | | | | | | | | | | |
| 063 DC Electrical Distribution | | | | | | | | X | | | | Ability to (a) predict the impacts of the following malfunctions or operations on the DC electrical systems; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) A2.01 Grounds | 3.2 | 89 |
| 064 Emergency Diesel Generator | | | | | | | | | | | | | | |
| 073 Process Radiation Monitoring | | | | | | | | | | | | | | |
| 076 Service Water | | | | | | | | | | | | | | |
| 078 Instrument Air | | | | | | | | | | | | | | |
| 103 Containment | | | | | | | | | | | X | 2.4.38 Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required. (CFR: 41.10 / 43.5 / 45.11) | 4.4 | 90 |
| K/A Category Point Totals: | | | | | | | | 3 | | | | 2 | Group Point Total: | 5 |

| ES-401 | PWR Examination Outline Plant Systems - Tier 2/Group 2 (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 | # |
| 075 Circulating Water | | | | | | | | | | | | | | |
| 079 Station Air | | | | | | | | | | | | | | |
| 086 Fire Protection | | | | | | | | | | | | | | |
| K/A Category Point Totals: | | | | | | | | 1 | | | 2 | Group Point Total: | | 3 |

| Facility: <u>South Texas Project</u> | | Date of Exam: <u>09/26/2013</u> | | | | |
|--------------------------------------|----------|--|-----|----|----------|----|
| Category | K/A # | Topic | RO | | SRO-Only | |
| | | | IR | # | IR | # |
| 1. Conduct of Operations | 2.1. | 2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (CFR: 41.5 / 43.5 / 45.12 / 45.13) | 4.4 | 66 | | |
| | 2.1. | 2.1.3 Knowledge of shift or short-term relief turnover practices. (CFR: 41.10 / 45.13) | 3.7 | 67 | | |
| | 2.1. | 2.1.4 Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, “no-solo” operation, maintenance of active license status, 10CFR55, etc. (CFR: 41.10 / 43.2) | 3.3 | 68 | | |
| | 2.1. | 2.1.34 Knowledge of primary and secondary plant chemistry limits. (CFR: 41.10 / 43.5 / 45.12) | | | 3.5 | 94 |
| | Subtotal | | | | 3 | 1 |

| Facility: South Texas Project | | Date of Exam: 09/26/2013 | | | | |
|-------------------------------|----------|---|-----|----|----------|----|
| Category | K/A # | Topic | RO | | SRO-Only | |
| | | | IR | # | IR | # |
| 2. Equipment Control | 2.2. | 2.2.22 Knowledge of limiting conditions for operations and safety limits. (CFR: 41.5 / 43.2 / 45.2) | 4.0 | 69 | | |
| | 2.2. | 2.2.37 Ability to determine operability and/or availability of safety related equipment. (CFR: 41.7 / 43.5 / 45.12) | 3.6 | 70 | | |
| | 2.2. | 2.2.13 Knowledge of tagging and clearance procedures. (CFR: 41.10 / 45.13) | | | 4.3 | 95 |
| | 2.2. | 2.2.20 Knowledge of the process for managing troubleshooting activities. (CFR: 41.10 / 43.5 / 45.13) | | | 3.8 | 96 |
| | Subtotal | | | | 2 | 2 |

| Facility: South Texas Project | | Date of Exam: 09/26/2013 | | | | |
|-------------------------------|----------|---|-----|----|----------|----|
| Category | K/A # | Topic | RO | | SRO-Only | |
| | | | IR | # | IR | # |
| 3. Radiation Control | 2.3. | 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. (CFR: 41.12 / 43.4 / 45.9 / 45.10) | 3.4 | 71 | | |
| | 2.3. | 2.3.14 Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. (CFR: 41.12 / 43.4 / 45.10) | 3.4 | 72 | | |
| | 2.3. | 2.3.12 Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. (CFR: 41.12 / 45.9 / 45.10) | 3.2 | 73 | | |
| | 2.3. | 2.3.11 Ability to control radiation releases. (CFR: 41.11 / 43.4 / 45.10) | | | 4.3 | 97 |
| | 2.3. | 2.3.6 Ability to approve release permits. (CFR: 41.13 / 43.4 / 45.10) | | | 3.8 | 98 |
| | Subtotal | | | | 3 | |

| Facility: <u>South Texas Project</u> | | Date of Exam: <u>09/26/2013</u> | | | | |
|---|----------|--|-----|----|----------|-----|
| Category | K/A # | Topic | RO | | SRO-Only | |
| | | | IR | # | IR | # |
| 4. Emergency Procedures / Plan | 2.4. | 2.4.6 Knowledge of EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13) | 3.7 | 74 | | |
| | 2.4. | 2.4.11 Knowledge of abnormal condition procedures. (CFR: 41.10 / 43.5 / 45.13) | 4.0 | 75 | | |
| | 2.4. | 2.4.14 Knowledge of general guidelines for EOP usage. (CFR: 41.10 / 45.13) | | | 4.5 | 99 |
| | 2.4. | 2.4.16 Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines. (CFR: 41.10 / 43.5 / 45.13) | | | 4.4 | 100 |
| | Subtotal | | | 2 | | 2 |
| Tier 3 Point Total | | | | 10 | | 7 |

| Tier/ Group | Randomly Selected K/A | Reason For Rejection |
|----------------|--------------------------|----------------------|
|----------------|--------------------------|----------------------|

Outline NRC generated – no initial K/A rejections.

| Facility: <u>South Texas Project</u> | | Date of Examination: <u>09-30-2013</u> |
|---|---------------|--|
| Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/> | | Operating Test Number: <u>LOT 19 NRC Exam</u> |
| Administrative Topic (see Note) | Type Code* | Describe activity to be performed |
| Conduct of Operations | D,R | A1 Peer Check Operator Logs G2.1.3 Knowledge of shift or short-term relief practices. (3.7/3.9) |
| Conduct of Operations | D,P,R | A2 Determine Dilution Required for Power Increase G2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (4.4/4.7) |
| Equipment Control | D,R | A3 Prepare ECO for SFP Skimmer Pump G2.2.13 Knowledge of tagging and clearance procedures. (4.1/4.3) |
| Radiation Control | | |
| Emergency Procedures/Plan | N,R | A4 Complete an Offsite Agency Notification Message Form G2.4.39 Knowledge of RO responsibilities in emergency plan implementation. (3.9/3.8) |
| NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, then 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: <u>South Texas Project</u> | | Date of Examination: <u>09-30-2013</u> |
|---|---------------|---|
| Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/> | | Operating Test Number: <u>LOT 19 NRC Exam</u> |
| Administrative Topic (see Note) | Type Code* | Describe activity to be performed |
| Conduct of Operations | D,R | A5 Review Control Room Logs G2.1.3 Knowledge of shift or short-term relief practices. (3.7/3.9) |
| Conduct of Operations | D,R | A6 Review RCS Inventory and Determine TS G2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (4.4/4.7) |
| Equipment Control | N,R | A7 Review Completed Surveillance (ECW) G2.2.12 Knowledge of surveillance procedures. (3.7/4.1) |
| Radiation Control | D,R | A8 Initiate a Dose Extension G2.3.13 Knowledge of radiation 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. (3.4/3.8) |
| Emergency Procedures/Plan | M,R | A9 Determine EAL G2.4.41 Knowledge of the emergency action level thresholds and classifications. (2.9/4.6) |
| NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, then 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) | | |

STP LOT-19
NRC Admin JPM Description

RO

- (A1) Peer Check Operator Logs
Demonstrate the ability to Peer Check Control Room Operator Logs from 0PSP03-ZQ-0028, Operator Logs, for any adverse trends and the appropriate corrective actions that would need to be taken in accordance with 0POP01-ZQ-0022, Plant Operations Shift Routines.
- (A2) Determine Dilution Required for Power Increase
Demonstrate the knowledge required to determine the appropriate amount of dilution water to add for a given power increase.
- (A3) Prepare ECO for Spent Fuel Pool Skimmer Pump
Demonstrate the ability to prepare an Equipment Clearance Order per 0PGP03-ZO-EC01, Equipment Clearance Orders.
- (A4) Prepare an Offsite Agency Notification Message Form
Demonstrate the ability to prepare an Offsite Agency Notification Message Form for approval by the Emergency Director per 0ERP01-ZV-IN02, Notifications to Offsite Agencies.

SRO

- (A5) Review Control Room Logs
Demonstrate the ability to review and approve Control Room Operator Logs from 0PSP03-ZQ-0028, Operator Logs, for any adverse trends and the appropriate corrective actions that would need to be taken in accordance with 0POP01-ZQ-0022, Plant Operations Shift Routines.
- (A6) Review RCS Inventory and Determine TS
Demonstrate the ability to review a completed calculation of Reactor Coolant Inventory and apply the appropriate Technical Specifications in accordance with 0PSP03-RC-0006A, Alternate Reactor Coolant Inventory, and STPs Technical Specifications.
- (A7) Review Completed Surveillance (ECW)
Demonstrate the ability to review a completed surveillance on the Essential Cooling Water System per 0PSP03-EW-0017, Essential Cooling Water System Train A Testing, in accordance with 0PGP03-ZE-0004, Plant Surveillance Program.
- (A8) Initiate a Dose Extension
Demonstrate the ability to the requirements for a dose extension in accordance with 0PGP03-ZR-0050, Radiation Protection Program.
- (A9) Determine Emergency Action Level
Demonstrate the ability to correctly determine an Emergency Action Level for a given condition requiring entry into the STPNOC Emergency Action Plan.

| Facility: <u>South Texas Project</u> | | Date of Examination: <u>09-30-2013</u> |
|--|-------------------------------------|--|
| Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/> | | Operating Test No.: <u>LOT 19 NRC Exam</u> |
| 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 |
| a. (S1) Transfer MFW from LPFRV to MFRV KA: 035 A4.01 (3.7/3.6) | D,S | 4P |
| b. (S2) Manually Load an ESF Bus KA: 026 A4.01 (3.3/3.1) | D,S | 6 |
| c. (S3) Power Range NI Failure KA: 015 A4.03 (3.8/3.9) | D,P,S | 7 |
| d. (S4) PRT Feed and Bleed KA: 007 A2.01 (3.9/4.2) | D,S | 5 |
| e. (S5) Trip an RCP KA: 002 A3.03 (4.4/4.6) | A,L,M,S | 2 |
| f. (S6) Respond to ECW Low Discharge Pressure KA: 008 A4.01 (3.3/3.1) | A,D,EN,L,P,S | 8 |
| g. (S7) Re-Establish RCP Seal Injection KA: 004 A4.11 (3.4/3.3) | A,D,S | 1 |
| h. (S8) Fill SI Accumulator KA: 006 A4.07 (4.4/4.4) | D,EN,S | 3 |
| In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U) | | |
| i. (P1) Return GWPS to Service KA: 071 A2.02 (3.3/3.6) | A,D,R | 9 |
| j. (P2) Local Start of ESF DG KA: 064 A4.01 (4.0/4.3) | E,L,N | 6 |
| k. (P3) Failing Air to MSIVs and MSIBs KA: 039 A4.01 (2.9/2.8) | A,E,L,M | 4S |
| 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 Code | Criteria for RO/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 Features | - / - / ≥ 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 | | |

| Facility: <u>South Texas Project</u> | | Date of Examination: <u>09-30-2013</u> |
|--|-------------------------------------|--|
| Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/> | | Operating Test No.: <u>LOT 19 NRC Exam</u> |
| 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 |
| b. (S2) Manually Load an ESF Bus KA: 026 A4.01 (3.3/3.1) | D,S | 6 |
| c. (S3) Power Range NI Failure KA: 015 A4.03 (3.8/3.9) | D,P,S | 7 |
| d. (S4) PRT Feed and Bleed KA: 007 A2.01 (3.9/4.2) | D,S | 5 |
| e. (S5) Trip an RCP KA: 002 A3.03 (4.4/4.6) | A,L,M,S | 2 |
| f. (S6) Respond to ECW Low Discharge Pressure KA: 008 A4.01 (3.3/3.1) | A,D,EN,L,P,S | 8 |
| g. (S7) Re-Establish RCP Seal Injection KA: 004 A4.11 (3.4/3.3) | A,D,S | 1 |
| h. (S8) Fill SI Accumulator KA: 006 A4.07 (4.4/4.4) | D,EN,S | 3 |
| In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U) | | |
| i. (P1) Return GWPS to Service KA: 071 A2.02 (3.3/3.6) | A,D,R | 9 |
| j. (P2) Local Start of ESF DG KA: 064 A4.01 (4.0/4.3) | E,L,N | 6 |
| k. (P3) Failing Air to MSIVs and MSIBs KA: 039 A4.01 (2.9/2.8) | A,E,L,M | 4S |
| 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 Code | Criteria for RO/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 Features | - / - / ≥ 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 | | |

| | | |
|--|-------------------------------------|--|
| Facility: <u>South Texas Project</u> | | Date of Examination: <u>09-30-2013</u> |
| Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/> | | Operating Test No.: <u>LOT 19 NRC Exam</u> |
| 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 |
| | | |
| | | |
| | | |
| | | |
| | | |
| g. (S7) Re-Establish RCP Seal Injection KA: 004 A4.11 (3.4/3.3) | A,D,S | 1 |
| h. (S8) Fill SI Accumulator KA: 006 A4.07 (4.4/4.4) | D,EN,S | 3 |
| In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U) | | |
| i. (P1) Return GWPS to Service KA: 071 A2.02 (3.3/3.6) | A,D,R | 9 |
| j. (P2) Local Start of ESF DG KA: 064 A4.01 (4.0/4.3) | E,L,N | 6 |
| k. (P3) Failing Air to MSIVs and MSIBs KA: 039 A4.01 (2.9/2.8) | A,E,L,M | 4S |
| 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 Code | Criteria for RO/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 Features | - / - / ≥ 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 | | |

STP LOT-19
NRC Systems JPM Description

Control Room Systems JPMs

- (S1) Transfer MFW from LPFRV to MFRV
Demonstrate the ability to control Steam Generator levels when aligning Main Feedwater flow from the Low Power Feedwater Regulation Valve to the Main Feedwater Regulation Valve in accordance with 0POP03-ZG-0005, Plant Startup to 100%.
- (S2) Manually Load an ESF Bus
Demonstrate the ability to manually load an ESF Bus that has failed to automatically load in accordance with 0POP04-AE-0001, First Response to Loss of Any or All 13.8KV or 4.16KV Bus.
- (S3) Power Range NI Failure
Demonstrate the ability to perform the actions necessary to mitigate the affects of a Power Range Nuclear Instrument failure in accordance with 0POP04-NI-0001, Nuclear Instrument Malfunction.
- (S4) PRT Feed and Bleed
Demonstrate the ability to control Reactor Coolant System Pressurizer Relief Tank parameters in accordance with 0POP02-RC-0001, Pressurizer Relief Tank and Reactor Coolant Drain Tank.
- (S5) Trip an RCP
Demonstrate the ability to start a Reactor Coolant Pump and take appropriate action when a Reactor Coolant Pump critical parameter is not within band in accordance with 0POP02-RC-0004, Operation of Reactor Coolant Pumps, and 0POP04-RC-0002, Reactor Coolant Pump Off Normal. This is an Alternate Path JPM.
- (S6) Respond to ECW Low Discharge Pressure
Demonstrate the ability to start an Essential Cooling Water Pump and take appropriate action when an Essential Cooling Water Pump trips in accordance with 0POP02-EW-0001, Essential Cooling Water Operations, and 0POP09-AN-02M3, Annunciator Lampbox 2M03 Response Instructions. This is an Alternate Path JPM.
- (S7) Re-Establish RCP Seal Injection
Demonstrate the ability to control Reactor Coolant Pump Seal Injection with the Positive Displacement Pump in accordance with 0POP09-AN-04M8, Annunciator Lampbox 4M08 Response Instruction. This is an Alternate Path JPM.
- (S8) Fill SI Accumulator
Demonstrate the ability to control Safety Injection System pumps and valves in order to fill a Safety Injection Accumulator to the proper level in accordance with 0POP02-SI-0001, Safety Injection Accumulators.

NOTE: All Control Room JPMs will be performed dynamically in the Simulator. The following JPMs will be performed in pairs; S3 & S4 together, S5 & S6 together and S7 & S8 together.

STP LOT-19
NRC Systems JPM Description

In Plant Systems JPMs

- (P1) Return GWPS to Service
Demonstrate the ability to startup the GWPS when Inlet Header O2 is greater than 1% requiring a Nitrogen Purge in accordance with 0POP02-GW-0001, Gaseous Waste Processing System Operations. This is an Alternate Path JPM.
- (P2) Local Start of ESF DG
Demonstrate the ability to locally control an Engineered Safety Feature Diesel Generator in accordance with 0POP02-DG-0001, Emergency Diesel Generator 11(21).
- (P3) Failing Air to MSIVs and MISBs
Demonstrate the ability to locally close Main Steam Isolation Valves and Main Steam Isolation Bypass Valves in accordance with 0POP05-EO-EC00, Loss of all AC Power, Addendum #4. This is an Alternate Path JPM.

FACILITY: SOUTH TEXAS PROJECT

DATE OF EXAM: 09/30/2013

OPERATING TEST NO.: LOT 19 NRC

| A P P L I C A N T | E V E N T T Y P E | Scenarios | | | | | | | | | | | | T O T A L | M I N I M U M (*) | | |
|---|---|---------------|-------------|-------------|---------------|-------------|-------------|---------------|-------------|-------------|---------------|-------------|-------------|-----------------------|--|---|---|
| | | 1 | | | 2 | | | 3 | | | 4 | | | | R | I | U |
| | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | | | | |
| | | S R O | A T C | B O P | S R O | A T C | B O P | S R O | A T C | B O P | S R O | A T C | B O P | | | | |
| Crew A | RX | | | 1 | | | | | | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | | | | | | | | 1 | | | 1 | 1 | 1 | 1 |
| | I/C | | | 4,5,7 | | | | | | | 2,3,4,5,7 | | | 8 | 4 | 4 | 2 |
| | MAJ | | | 6 | | | | | | | 6 | | | 2 | 2 | 2 | 1 |
| | TS | | | | | | | | | | 2,4 | | | 2 | 0 | 2 | 2 |
| Crew A | RX | 1 | | | | | | | | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | 0 | 1 | 1 | 1 |
| | I/C | 2,3,4,5,7 | | | | | | | | | | 2,4 | | 7 | 4 | 4 | 2 |
| | MAJ | 6 | | | | | | | | | | 6 | | 2 | 2 | 2 | 1 |
| | TS | 2,3 | | | | | | | | | | | | 2 | 0 | 2 | 2 |
| Crew A | RX | | 1 | | | | | | | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | 1 | 1 | 1 | 1 | 1 |
| | I/C | | 2,3 | | | | | | | | | | 3,5 | 4 | 4 | 4 | 2 |
| | MAJ | | 6 | | | | | | | | | | 6 | 2 | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | 0 | 0 | 2 | 2 |
| Crew A | RX | | | | | | | | | | | | | | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | | 1 | 1 | 1 |
| | I/C | | | | | | | | | | | | | | 4 | 4 | 2 |
| | MAJ | | | | | | | | | | | | | | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | | 0 | 2 | 2 |

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

FACILITY: SOUTH TEXAS PROJECT

DATE OF EXAM: 09/30/2013

OPERATING TEST NO.: LOT 19 NRC

| A P P L I C A N T | E V E N T T Y P E | Scenarios | | | | | | | | | | | | T O T A L | M I N I M U M (*) | | |
|---|---|---------------|-------------|-------------|---------------|-------------|-------------|---------------|-------------|-------------|---------------|-------------|-------------|-----------------------|--|---|---|
| | | 1 | | | 2 | | | 3 | | | 4 | | | | R | I | U |
| | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | | | | |
| | | S R O | A T C | B O P | S R O | A T C | B O P | S R O | A T C | B O P | S R O | A T C | B O P | | | | |
| Crew B | RX | | | | | | 5 | | | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | | | | | | | | 1 | | | 1 | 1 | 1 | 1 |
| | I/C | | | | | | 2,4,7 | | | | 2,3,4,5,7 | | | 8 | 4 | 4 | 2 |
| | MAJ | | | | | | 6 | | | | 6 | | | 2 | 2 | 2 | 1 |
| | TS | | | | | | | | | | 2,4 | | | 2 | 0 | 2 | 2 |
| Crew B | RX | | | | 5 | | | | | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | 0 | 1 | 1 | 1 |
| | I/C | | | | 1,2,3,4,7 | | | | | | | 2,4 | | 7 | 4 | 4 | 2 |
| | MAJ | | | | 6 | | | | | | | 6 | | 2 | 2 | 2 | 1 |
| | TS | | | | 1,2 | | | | | | | | | 2 | 0 | 2 | 2 |
| Crew B | RX | | | | | 5 | | | | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | 1 | | 1 | 1 | 1 | 1 |
| | I/C | | | | | 1,3 | | | | | | 3,5 | | 4 | 4 | 4 | 2 |
| | MAJ | | | | | 6 | | | | | | 6 | | 2 | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | 0 | 0 | 2 | 2 |
| Crew B | RX | | | | | | | | | | | | | | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | | 1 | 1 | 1 |
| | I/C | | | | | | | | | | | | | | 4 | 4 | 2 |
| | MAJ | | | | | | | | | | | | | | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | | 0 | 2 | 2 |

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

| A P P L I C A N T | E V E N T T Y P E | Scenarios | | | | | | | | | | | | T O T A L | M I N I M U M (*) | | |
|--|---|---------------|-------------|-------------|---------------|-------------|-------------|-----------------|-------------|-------------|---------------|-------------|-------------|-----------------------|--|---|---|
| | | 1 | | | 2 | | | 3 | | | 4 | | | | R | I | U |
| | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | | | | |
| | | S R O | A T C | B O P | S R O | A T C | B O P | S R O | A T C | B O P | S R O | A T C | B O P | | | | |
| Crew C RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/> | RX | 1 | | | | | | | | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | | | | | | 1 | | | | | 1 | 1 | 1 | 1 |
| | I/C | 2,3,4 5,7 | | | | | | | 2,4 | | | | | 7 | 4 | 4 | 2 |
| | MAJ | 6 | | | | | | | 6 | | | | | 2 | 2 | 2 | 1 |
| | TS | 2,3 | | | | | | | | | | | | 2 | 0 | 2 | 2 |
| RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/> | RX | | 1 | | | | | | | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | | | | | 1 | | | | | | 1 | 1 | 1 | 1 |
| | I/C | | 2,3 | | | | | 2,3,4, 5,7,8 | | | | | | 8 | 4 | 4 | 2 |
| | MAJ | | 6 | | | | | 6 | | | | | | 2 | 2 | 2 | 1 |
| | TS | | | | | | | 3,5 | | | | | | 2 | 0 | 2 | 2 |
| RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/> | RX | | | 1 | | | | | 4 | | | | | 2 | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | 0 | 1 | 1 | 1 |
| | I/C | | | 4,5,7 | | | | 3,5 | | | | | | 5 | 4 | 4 | 2 |
| | MAJ | | | 6 | | | | 6 | | | | | | 2 | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | 0 | 0 | 2 | 2 |
| RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/> | RX | | | | | | | | | | | | | | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | | 1 | 1 | 1 |
| | I/C | | | | | | | | | | | | | | 4 | 4 | 2 |
| | MAJ | | | | | | | | | | | | | | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | | 0 | 2 | 2 |

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

| A P P L I C A N T | E V E N T T Y P E | Scenarios | | | | | | | | | | | | T O T A L | M I N I M U M (*) | | |
|--|---|---------------|-------------|-------------|---------------|-------------|-------------|-----------------|-------------|-------------|---------------|-------------|-------------|-----------------------|--|---|---|
| | | 1 | | | 2 | | | 3 | | | 4 | | | | R | I | U |
| | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | | | | |
| | | S R O | A T C | B O P | S R O | A T C | B O P | S R O | A T C | B O P | S R O | A T C | B O P | | | | |
| Crew D RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/> | RX | 1 | | | 5 | | | | | | | | | 2 | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | 0 | 1 | 1 | 1 |
| | I/C | 2,3,4 5,7 | | | 1,2,3 ,4,7 | | | | | | | | | 10 | 4 | 4 | 2 |
| | MAJ | 6 | | | 6 | | | | | | | | | 2 | 2 | 2 | 1 |
| | TS | 2,3 | | | 1,2 | | | | | | | | | 4 | 0 | 2 | 2 |
| RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/> | RX | | 1 | | | | | | | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | | | | | 1 | | | | | | 1 | 1 | 1 | 1 |
| | I/C | | 2,3 | | | | | 2,3,4, 5,7,8 | | | | | | 8 | 4 | 4 | 2 |
| | MAJ | | 6 | | | | | 6 | | | | | | 2 | 2 | 2 | 1 |
| | TS | | | | | | | 3,5 | | | | | | 2 | 0 | 2 | 2 |
| RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/> | RX | | | 1 | | | | | 4 | | | | | 2 | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | 0 | 1 | 1 | 1 |
| | I/C | | | 4,5,7 | | | | 3,5 | | | | | | 5 | 4 | 4 | 2 |
| | MAJ | | | 6 | | | | 6 | | | | | | 2 | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | 0 | 0 | 2 | 2 |
| RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/> | RX | | | | | | | | | | | | | | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | | 1 | 1 | 1 |
| | I/C | | | | | | | | | | | | | | 4 | 4 | 2 |
| | MAJ | | | | | | | | | | | | | | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | | 0 | 2 | 2 |

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

FACILITY: SOUTH TEXAS PROJECT

DATE OF EXAM: 09/30/2013

OPERATING TEST NO.: LOT 19 NRC

| A P P L I C A N T | E V E N T T Y P E | Scenarios | | | | | | | | | | | | T O T A L | M I N I M U M(*) | | |
|---|---|---------------|-------------|-------------|---------------|-------------|-------------|--------------------|-------------|-------------|---------------|-------------|-------------|-----------------------|------------------------------------|---|---|
| | | 1 | | | 2 | | | 3 | | | 4 | | | | R | I | U |
| | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | | | | |
| | | S R O | A T C | B O P | S R O | A T C | B O P | S R O | A T C | B O P | S R O | A T C | B O P | | | | |
| Crew E | | | | | | | | | | | | | | | | | |
| RO <input type="checkbox"/> | RX | 1 | | | 5 | | | | | | | | | 2 | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | 0 | 1 | 1 | 1 |
| SRO-I <input type="checkbox"/> | I/C | 2,3,4 5,7 | | | 1,2,3 4,7 | | | | | | | | | 10 | 4 | 4 | 2 |
| SRO-U <input checked="" type="checkbox"/> | MAJ | 6 | | | 6 | | | | | | | | | 2 | 2 | 2 | 1 |
| | TS | 2,3 | | | 1,2 | | | | | | | | | 4 | 0 | 2 | 2 |
| RO <input type="checkbox"/> | RX | | | | | 5 | | | | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | | | | | 1 | | | | | | 1 | 1 | 1 | 1 |
| SRO-I <input checked="" type="checkbox"/> | I/C | | | | 1,3 | | | 2,3,4 5,7, 8 | | | | | | 8 | 4 | 4 | 2 |
| SRO-U <input type="checkbox"/> | MAJ | | | | 6 | | | 6 | | | | | | 2 | 2 | 2 | 1 |
| | TS | | | | | | | 3,5 | | | | | | 2 | 0 | 2 | 2 |
| RO <input checked="" type="checkbox"/> | RX | | | | | 5 | | | 4 | | | | | 2 | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | 0 | 1 | 1 | 1 |
| SRO-I <input type="checkbox"/> | I/C | | | | | 2,4,7 | | 3,5 | | | | | | 5 | 4 | 4 | 2 |
| SRO-U <input type="checkbox"/> | MAJ | | | | | 6 | | 6 | | | | | | 2 | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | 0 | 0 | 2 | 2 |
| RO <input type="checkbox"/> | RX | | | | | | | | | | | | | | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | | 1 | 1 | 1 |
| SRO-I <input type="checkbox"/> | I/C | | | | | | | | | | | | | | 4 | 4 | 2 |
| SRO-U <input type="checkbox"/> | MAJ | | | | | | | | | | | | | | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | | 0 | 2 | 2 |

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

FACILITY: SOUTH TEXAS PROJECT

DATE OF EXAM: 09/30/2013

OPERATING TEST NO.: LOT 19 NRC

| A P P L I C A N T | E V E N T T Y P E | Scenarios | | | | | | | | | | | | T O T A L | M I N I M U M(*) | | |
|---|---|---------------|-------------|-------------|---------------|-------------|-------------|---------------------|-------------|-------------|---------------|-------------|-------------|-----------------------|------------------------------------|---|---|
| | | 1 | | | 2 | | | 3 | | | 4 | | | | R | I | U |
| | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | | | | |
| | | S R O | A T C | B O P | S R O | A T C | B O P | S R O | A T C | B O P | S R O | A T C | B O P | | | | |
| Crew F | | | | | | | | | | | | | | | | | |
| RO <input type="checkbox"/> | RX | | | | 5 | | | | | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | | | | | 1 | | | | | | 1 | 1 | 1 | 1 |
| SRO-I <input type="checkbox"/> | I/C | | | | 1,2,3 ,4,7 | | | 2,3,4 ,5,7, 8 | | | | | | 11 | 4 | 4 | 2 |
| SRO-U <input checked="" type="checkbox"/> | MAJ | | | | 6 | | | 6 | | | | | | 2 | 2 | 2 | 1 |
| | TS | | | | 1,2 | | | 3,5 | | | | | | 4 | 0 | 2 | 2 |
| RO <input checked="" type="checkbox"/> | RX | | | | | 5 | | | | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | | | | | | 1 | | | | | 1 | 1 | 1 | 1 |
| SRO-I <input type="checkbox"/> | I/C | | | | 1,3 | | | | 2,4 | | | | | 4 | 4 | 4 | 2 |
| SRO-U <input type="checkbox"/> | MAJ | | | | 6 | | | | 6 | | | | | 2 | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | 0 | 0 | 2 | 2 |
| RO <input checked="" type="checkbox"/> | RX | | | | | 5 | | 4 | | | | | | 2 | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | 0 | 1 | 1 | 1 |
| SRO-I <input type="checkbox"/> | I/C | | | | 2,4,7 | | | 3,5 | | | | | | 5 | 4 | 4 | 2 |
| SRO-U <input type="checkbox"/> | MAJ | | | | 6 | | | 6 | | | | | | 2 | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | 0 | 0 | 2 | 2 |
| RO <input type="checkbox"/> | RX | | | | | | | | | | | | | | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | | 1 | 1 | 1 |
| SRO-I <input type="checkbox"/> | I/C | | | | | | | | | | | | | | 4 | 4 | 2 |
| SRO-U <input type="checkbox"/> | MAJ | | | | | | | | | | | | | | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | | 0 | 2 | 2 |

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

FACILITY: SOUTH TEXAS PROJECT

DATE OF EXAM: 09/30/2013

OPERATING TEST NO.: LOT 19 NRC

| A P P L I C A N T | E V E N T T Y P E | Scenarios | | | | | | | | | | | | T O T A L | M I N I M U M(*) | | |
|---|---|---------------|-------------|-------------|---------------|-------------|-------------|---------------|-------------|-------------|---------------|-------------|-------------|-----------------------|------------------------------------|---|---|
| | | 1 | | | 2 | | | 3 | | | 4 | | | | R | I | U |
| | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | | | | |
| | | S R O | A T C | B O P | S R O | A T C | B O P | S R O | A T C | B O P | S R O | A T C | B O P | | | | |
| Crew G | | | | | | | | | | | | | | | | | |
| RO <input checked="" type="checkbox"/> | RX | | 1 | | | | 5 | | | | | | | 2 | 1 | 1 | 0 |
| | NOR | | | | | | | | 1 | | | | | 1 | 1 | 1 | 1 |
| | SRO-I <input type="checkbox"/> | I/C | | 2,3 | | | 2,4,7 | | | 2,4 | | | | 7 | 4 | 4 | 2 |
| | SRO-U <input type="checkbox"/> | MAJ | | 6 | | | 6 | | | 6 | | | | 3 | 2 | 2 | 1 |
| | | TS | | | | | | | | | | | | 0 | 0 | 2 | 2 |
| RO <input checked="" type="checkbox"/> | RX | | | 1 | | 5 | | | | | | | | 2 | 1 | 1 | 0 |
| | NOR | | | | | | | | 1 | | | | | 1 | 1 | 1 | 1 |
| | SRO-I <input type="checkbox"/> | I/C | | 4,5,7 | | 1,3 | | | 2,4 | | | | | 7 | 4 | 4 | 2 |
| | SRO-U <input type="checkbox"/> | MAJ | | 6 | | 6 | | | 6 | | | | | 3 | 2 | 2 | 1 |
| | | TS | | | | | | | | | | | | 0 | 0 | 2 | 2 |
| RO <input type="checkbox"/> | RX | | | | | | | | | | | | | | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | | 1 | 1 | 1 |
| | SRO-I <input type="checkbox"/> | I/C | | | | | | | | | | | | | 4 | 4 | 2 |
| | SRO-U <input type="checkbox"/> | MAJ | | | | | | | | | | | | | 2 | 2 | 1 |
| | | TS | | | | | | | | | | | | | 0 | 2 | 2 |
| RO <input type="checkbox"/> | RX | | | | | | | | | | | | | | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | | 1 | 1 | 1 |
| | SRO-I <input type="checkbox"/> | I/C | | | | | | | | | | | | | 4 | 4 | 2 |
| | SRO-U <input type="checkbox"/> | MAJ | | | | | | | | | | | | | 2 | 2 | 1 |
| | | TS | | | | | | | | | | | | | 0 | 2 | 2 |

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Facility: South Texas Project

Scenario No.: 1

Op-Test No.: LOT19 NRC

Examiners: _____Operators: __________

_____**Initial Conditions:**

- 100% Power and Stable.

Turnover:

- Train 'A' Outage in progress: HHSI & LHSI Pumps 1A, SI-MOV-0016A and AFW Pump 11.
- Rod Control currently in Manual to perform 0PSP02-RC-0410, Delta T and T Average ACOT, on Channel III.
- Lower Reactor Power to 98% per 0POP03-ZG-0008, Power Operations, to allow performance of 0POP07-MS-0003, Main Turbine Steam Inlet Valve Test.

| Event No. | Malf. No. | Event Type* | Event Description |
|---------------|------------------|------------------------------|---|
| 1 (0 min) | N/A | RO (R) BOP (R) SRO (R) | Lower Reactor Power to 98%. |
| 2 (20 min) | 02-19-03 True | RO (I) SRO (I, TS) | Controlling Channel of PZR Pressure PT-0457 Fails High. |
| 3 (N/A) | 50-HV-01 True | RO (C) SRO (C, TS) | Pressurizer PORV 655A fails to close after opening. Occurs with Pressurizer PT-0457 malfunction. (CT) |
| 4 (35 min) | 08-15-02 True | BOP (I) SRO (I) | SG B Controlling Feed Flow Channel FT-0520 Fails Low. |
| 5 (45 min) | 06-15-01 .24 | BOP (C) SRO (C) | EHC Leak forces crew to manually trip Reactor, Main Turbine and SGFPTs |
| 6 (60 min) | 05-02-03 .5 | RO (M) BOP (M) SRO (M) | Major Steam Line Break inside Containment on SG 1C. |
| 7 (N/A) | 01-12-06 True | BOP (C) SRO (C) | MSL Isolation fails to Auto Actuate. (Integral to Scenario) (CT) |

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

| Target Quantitative Attributes (Per Scenario; See Section D.5.d) | Actual Attributes |
|--|-------------------|
| 1. Total malfunctions (5-8) | 5 |
| 2. Malfunctions after EOP entry (1-2) | 1 |
| 3. Abnormal events (2-4) | 4 |
| 4. Major transients (1-2) | 1 |
| 5. EOPs entered/requiring substantive actions (1-2) | 1 |
| 6. EOP contingencies requiring substantive actions (0-2) | 0 |
| 7. Critical tasks (2-3) | 2 |

STP LOT-19
NRC Scenario #1 Description

Initial Conditions: The plant is at 100% power. Train 'A' Outage in progress: HHSI & LHSI Pumps 1A, SI-MOV-0016A and AFW Pump 11. Rod Control currently in Manual to perform 0PSP02-RC-0410, Delta T and T Average ACOT, on Channel III. Lower Reactor Power to 98% per 0POP03-ZG-0008, Power Operations, to allow performance of 0POP07-MS-0003, Main Turbine Steam Inlet Valve Test.

Event 1: The crew will lower Reactor Power to 98% per 0POP03-ZG-0008, Power Operations.

Event 2/3: Controlling channel of PZR Pressure PT-0457 fails high. When the PZR Pressure Channel fails high, PZR PORV 655A will open and then fail to close. The crew will respond using POP04-RP-0001, Loss of Automatic Pressurizer Pressure Control. The crew will close the block valve for PZR PORV 655A. The SRO will address Tech Spec implications. **(Critical Task)**

Event 4: SG B Controlling Feed Flow Channel FT-0520 fails low. The crew will respond using 0POP04-FW-0001, Loss of SG Level Control.

Event 5: An EHC leak develops in the EHC system. The leak will be of sufficient size and at such a location that repairs will not be feasible prior to removing the Main Turbine and SGFPTs from service. The crew will respond using 0POP09-AN-07M3, Window E-2, D-2 and B-2 for a lowering EHC Reservoir level. Window B-2 for extreme low level will have the crew trip the Reactor, ensure the Main Turbine is tripped and trip all SGFPTs and then enter 0POP05-EO-EO00, Reactor Trip or Safety Injection. The crew will also secure the running EHC pumps.

Event 6: Once the crew has entered 0POP05-EO-ES01, Reactor Trip Response, and performed Step 4, Verified Control Rods Fully Inserted, a fault will occur on SG 1C Main Steam line inside containment. The crew will transition back to 0POP05-EO-EO00, Reactor Trip or Safety Injection.

Event 7: The automatic actuation of Main Steam Isolation will not occur. The crew will have to manually initiate closing of the Main Steam Isolation Valves. **(Critical Task)**

Termination: The scenario will terminate after the crew exits 0POP05-EO-EO20, Faulted Steam Generator Isolation and transitions to 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, or 0POP05-EO-ES11, SI Termination.

Critical Tasks:

- Manually close block valve for stuck open PZR PORV such that a manual or automatic Reactor Trip does not unintentionally occur.
- Manually initiate a Main Steam Isolation or manually close all Main Steam Isolation and Main Steam Isolation Bypass valves prior to an orange path on Subcriticality or Integrity CSF or before transition to 0POP05-EO-EC21, Uncontrolled Depressurization of all Steam Generators, which ever happens first.

Source: New

Facility: South Texas Project

Scenario No.: 2

Op-Test No.: LOT 19 NRC

Examiners: _____Operators: _____**Initial Conditions:**

- 75% power and stable. Maintaining power at 75% due to an offsite grid issue.

Turnover:

- Train B Outage in progress. CCW Pump 1B, RCFCs 11B and 12B and AFW Pump #12 are OOS.
- Start-up Feed Pump #14 is OOS for scheduled maintenance.

| Event No. | Malf. No. | Event Type* | Event Description |
|---------------|---|------------------------------|--|
| 1 (1 min) | 02-25-02 0 | RO (I) SRO (I, TS) | Loop 1A Cold Leg RTD T-0410B Fails Low. |
| 2 (10 min) | SA- PT545TV 0 | BOP (I) SRO (I, TS) | SG D Controlling Pressure Channel PT-0545 Fails Low. |
| 3 (20 min) | 03-05-01 True | RO (I) SRO (I) | VCT Level Transmitter LT-0112 fails high. |
| 4 (30 min) | Proteus- AIP- T6147ZM 1.119 | BOP (C) SRO (C) | Main Generator Stator Cooling DT Alarm due to high DT across Stator Bars 36B and 36T. |
| 5 (35 min) | 50-GG-01 True | RO (R) BOP (R) SRO (R) | The crew will receive a Generator Condition Monitor alarm with an associated GCM Verified Alarm, ICS Point BD-6023. The crew will perform a Fast Load Reduction at a rate 2% to 5% per minute. After the Fast Load Reduction begins the Main Generator will have a complete Fault that will cause a Reactor and Turbine Trip. (Integrated at 64% NI Power) |
| 6 (N/A) | 05-03-01 0.02 05-04-01 True 50-SA-10 0.1 | RO (M) BOP (M) SRO (M) | Faulted and Ruptured SG 1A (CT) (Integrated and Ramped in to Scenario) |
| 7 (N/A) | 50-AF-03 True AF-04 True 08-02-01 True | BOP (C) SRO (C) | AFW Pump #11 manual recirc valve was left open. AFW Pump #13 fails to auto start. AFW Pump Turbine #14 trips on overspeed. The crew will have to manually start AFW Pump #13 and/or close the manual recirc valve on AFW Pump #11 and cross connect to supply water to the intact SGs (CT) (Integral to Scenario) |

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

| Target Quantitative Attributes (Per Scenario; See Section D.5.d) | Actual Attributes |
|--|-------------------|
| 1. Total malfunctions (5–8) | 6 |
| 2. Malfunctions after EOP entry (1–2) | 1 |
| 3. Abnormal events (2–4) | 4 |
| 4. Major transients (1–2) | 1 |
| 5. EOPs entered/requiring substantive actions (1–2) | 2 |
| 6. EOP contingencies requiring substantive actions (0–2) | 1 |
| 7. Critical tasks (2–3) | 2 |

STP LOT-19
NRC Scenario #2 Description

Initial Conditions: 75% power and stable. Maintaining power at 75% due to an offsite grid issue. Train B Outage in progress: CCW Pump 1B, RCFCs 11B and 12B and AFW Pump #12 are OOS. Start-up Feed Pump #14 is OOS for scheduled maintenance.

Event 1: LOOP A Cold Leg RTD T-0410B fails low. The crew will respond using 0POP04-RP-0004, Failure of RCS Loop RTD Protection Channel. The SRO will address Tech Spec implications

Event 2: SG 1D controlling Pressure Channel PT-0545 fails low. The crew will respond using POP04-FW-0001, Loss of Steam Generator Level Control. The SRO will address Tech Spec implications.

Event 3: VCT Level Transmitter LT-0112 fails high. The crew will respond using 0POP09-AN-04M8, Window E-2, VCT LEVEL HI/LO.

Event 4: Main Generator Stator Bar 36T will begin to over heat and cause a high Stator Cooling Water DT between Stator Bar 36B and 36T. The crew will respond using 0POP09-AN-07M3, Window A-5, STATR COIL WTR DIFF TEMP HI/TEMP HI.

Event 5: Shortly after Main Generator Stator Bar 36T heats up the bar will begin to degrade and cause a GCM Verified Alarm, ICS Point BD-6023. The crew will respond using 0POP09-AN-07M3, Window A-4, GEN CONDITION MON ALARM. This will have the crew perform a fast load reduction at a rate of 2% to 5% per minute using 0POP04-TM-0005, Fast Load Reduction. Shortly after the crew begins lowering power the Main Generator will trip due to a Ground Fault. The crew will enter 0POP05-EO-EO00, Reactor Trip or SI, and then 0POP05-EO-ES01, Reactor Trip Response. (0POP05-EO-ES01 may not be entered due to the next event.)

Event 6: When the Reactor Trips, a Faulted and Ruptured SG 1A will be ramped in. The fault will be on the Main Steam line in the IVC. The crew will enter/reenter 0POP05-EO-EO00, Reactor Trip or Safety Injection, and then transition to 0POP05-EO-EO20, Faulted Steam Generator Isolation, to 0POP05-EO-EO30, SGTR, and finally to 0POP05-EO-EC31, SGTR with Loss of Reactor Coolant – Subcooled Recovery Desired. **(Critical Task)**

Event 7: When the AFW Actuation occurs after the Reactor Trip, AFW Pump #11 manual recirc valve has been left open, AFW Pump #13 will fail to auto start, and AFW Pump #14 will trip on overspeed. The crew will have to manually start AFW Pump #13 and/or close the manual recirc valve for AFW Pump #11 and cross connect to supply AFW to the intact SGs. **(Critical Task)**

Termination: The scenario will be terminated after the crew has initiated Boration of the RCS to meet Shutdown Margin requirements per 0POP05-EO-EC31, SGTR with Loss of Reactor Coolant – Subcooled Recovery Desired.

Critical Tasks:

- Initiate RCS Boration such that the Shutdown Margin will be met for cooling down the Unit per the Plant Curve Book, Figure 5.5, 68°F curve.
- Establish 576 gpm AFW flow to the SGs before transitioning out of 0POP05-EO-EO00, RX Trip or SI.

Source: New

Facility: South Texas Project

Scenario No.: 3

Op-Test No.: LOT19 NRC

Examiners: _____

Operators: _____

Initial Conditions:

- 100% Power and Stable.

Turnover:

- Train 'A' Outage in progress: HHSI & LHSI Pumps 1A, SI-MOV-0016A and AFW Pump 11.
- Rod Control currently in Manual to perform 0PSP02-RC-0410, Delta T and T Average ACOT, on Channel III.
- Maintenance has been trouble shooting an issue with pressure fluctuations in the EHC system. Maintenance has requested that Operations start EHC Pump #12 and secure EHC Pump #11.

| Event No. | Malf. No. | Event Type* | Event Description |
|---------------|--|------------------------------|---|
| 1 (0 min) | NA | BOP (N) SRO (N) | Start EHC Pump #12 and secure EHC Pump #11. |
| 2 (5 min) | OC_IAC66 M137643P ICKUPCA 0.005 | BOP (C) SRO (C) | CW Pump #13 trip and Discharge valve fails to close. |
| 3 (15 min) | 01-14-08 True | RO (I) SRO (I, TS) | DRPI indication for rod H6 fails (both channels). |
| 4 (25 min) | 06-04-01 0 | RO (R) BOP (C) SRO (C) | Loss of load. GV #1 fails closed. |
| 5 (35 min) | 02-03-04 0.08 | RO (C) SRO (C, TS) | 30 GPM RCS Leak. |
| 6 (45 min) | 02-03-04 1.0 | RO (M) BOP (M) SRO (M) | RCS Loop flow low on Loop D and SBLOCA (Integral to Scenario) |
| 7 (N/A) | | RO (C) SRO (C) | Auto Reactor Trip and Actuation Train C fail. Crew will have to manually trip the Reactor. (CT) (Integral to Scenario) |
| 8 (N/A) | | RO (C) SRO (C) | HHSI Pump 1B trip. Crew must manually start HHSI Pump 1C. (CT) (Integral to Scenario) |

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

| Target Quantitative Attributes (Per Scenario; See Section D.5.d) | Actual Attributes |
|--|-------------------|
| 1. Total malfunctions (5–8) | 6 |
| 2. Malfunctions after EOP entry (1–2) | 2 |
| 3. Abnormal events (2–4) | 4 |
| 4. Major transients (1–2) | 1 |
| 5. EOPs entered/requiring substantive actions (1–2) | 1 |
| 6. EOP contingencies requiring substantive actions (0–2) | 0 |
| 7. Critical tasks (2–3) | 2 |

STP LOT-19
NRC Scenario #3 Description

Initial Conditions: 100% Power and Stable. Train 'A' Outage in progress: HHSI & LHSI Pumps 1A, SI-MOV-0016A and AFW Pump 11. Rod Control currently in Manual to perform 0PSP02-RC-0410, Delta T and T Average ACOT, on Channel III. Maintenance has been trouble shooting an issue with pressure fluctuations in the EHC system. Maintenance has requested that Operations start EHC Pump #12 and secure EHC Pump #11.

Event 1: The crew will swap running EHC Pumps using 0POP02-EH-0001, Main Turbine Electro-Hydraulic Control System.

Event 2: Circ Water Pump #13 trips and Discharge Valve fails to auto close. The crew will respond using 0POP04-CW-0001, Loss of Circulating Water Flow.

Event 3: Both DRPI channels for rod K4 will fail. The crew will use 0POP09-AN-05M3, Window A-5, RPI TRBL, Window D-5, ROD SUPV MNTR ROD POSITION TRBL, and Window F-4, ROD BOTTOM to address the failures. The SRO will address Tech Spec implications.

Event 4: Main Turbine Governor Valve #1 fails closed. The crew will respond using 0POP04-TM-0001, Turbine Load Rejection. This event will also include a reactivity addition.

Event 5: 30 GPM leak from the RCS at the high pressure flow tap for Loop D. The crew will respond using 0POP04-RC-0003, Excessive RCS Leakage. The SRO will address Tech Spec implications.

Event 6/7: A SBLOCA will occur caused by the RCS Loop D high pressure flow tap completely failing. The crew will enter 0POP05-EO-EO00, Reactor Trip or Safety Injection, then 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant. The Reactor will immediately get a trip signal from RCS Loop D low flow when the SBLOCA occurs, however, the Reactor will not auto trip. The crew will have to manually trip the Reactor. **(Critical Task)**

Event 8: Actuation Train C will fail on the Reactor trip. When SI is actuated, HHSI Pump 1B will trip right after it starts on over current. With no HHSI pumps running, the crew will have to manually start HHSI Pump 1C to supply ECCS flow during the SBLOCA. **(Critical Task)**

Termination: The scenario will be terminated after SGs are depressurized to 1000 psig in 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant.

Critical Tasks:

- Manually trips the Reactor from the Control Room before completing Step 1 of 0POP05-EO-EO00.
- Establish flow from at least one HHSI Pump before transitioning out of 0POP05-EO-EO00 during a SBLOCA when RCS pressure remains between 400 psig and 1680 psig.

Source: New

Facility: South Texas Project

Scenario No.: 4

Op-Test No.: LOT19 NRC

Examiners: _____Operators: _____Initial Conditions:

- Unit 1 just completed a 30 day outage. A Plant Startup is in progress and Reactor Power is currently at 12% to 14% and stable.
- The Unit is at step 6.38 of 0POP03-ZG-0005, Plant Startup to 100%, ready to perform OPC Test on Main Turbine.

Turnover:

- Condensate Pump #13 and CL-ACW Pump #13 are OOS.

| Event No. | Malf. No. | Event Type* | Event Description |
|--|---|------------------------------|---|
| 1 (0 min) | (N/A) | BOP (N) SRO (N) | Perform OPC Test on Main Turbine and then continue with Plant Startup. |
| 2 (5 min) | 01-37-01 True | RO (I) SRO (I, TS) | Intermediate Range Channel NI 35 fails low. (Integral to Scenario) |
| 3 (10 min) | 05-14-01 0.845 | BOP (C) SRO (C) | Steam Header PT-0557 fails high. |
| 4 (20 min) | Q1L013_ TC_52_ BC047G TA_SWI T1 True | RO (C) SRO (C, TS) | E1C11 Battery Charger #1 failure with loss of 125VDC power to Train 'C' Class 1E 4.16KV Bus Control Power. |
| 5 (35 min) | 08-23-01 True | BOP (C) SRO (C) | Condensate Pump #11 Trips and Condensate Pump #12 will not start. |
| 6 (N/A) | 50-HH- 04 0.35 | RO (M) BOP (M) SRO (M) | LBLOCA. (Integral to Scenario) |
| 7 (N/A) | | RO (C) SRO (C) | LHSI Pumps 1A & 1B fail to Auto Start. (CT) (Integral to Scenario) |
| 8 (N/A) | | RO (C) SRO (C) | The auto swap over to cold leg recirculation will fail and the crew will have to manually align. (CT) (Integral to Scenario) |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS) Technical Specification | | | |

| Target Quantitative Attributes (Per Scenario; See Section D.5.d) | Actual Attributes |
|--|-------------------|
| 1. Total malfunctions (5–8) | 6 |
| 2. Malfunctions after EOP entry (1–2) | 2 |
| 3. Abnormal events (2–4) | 4 |
| 4. Major transients (1–2) | 1 |
| 5. EOPs entered/requiring substantive actions (1–2) | 2 |
| 6. EOP contingencies requiring substantive actions (0–2) | 0 |
| 7. Critical tasks (2–3) | 2 |

STP LOT-19
NRC Scenario #4 Description

Initial Conditions: Unit 1 just completed a 30 day outage. The Reactor is at 12% to 14% Power and Stable. Ready to perform OPC test on Main Turbine per OPOP03-ZG-0005, Plant Startup to 100%, Step 6.38, and then continue with Plant Startup. Condensate Pump #13 and CL-ACW Pump #13 are OOS.

Event 1: The crew will perform the OPC Test on the Main Turbine. OPOP03-ZG-0005, Plant Startup to 100%, Step 6.38 and then continue with Plant Startup.

Event 2: After the crew trips the Main Turbine, Intermediate Range Channel 35 fails low. The crew will respond using OPOP04-NI-0001, Nuclear Instrument Malfunction. The SRO will address Tech Spec implications.

Event 3: After addressing the failed IR Channel, Steam Header Pressure Transmitter PT-0557 will fail high. The crew will respond using OPOP04-MS-0001, Excessive Steam Demand. The crew will have to take manual control of the Steam Dumps to control RCS temperature.

Event 4: After addressing the failure of PT-0557, E1C11 Battery Charger #1 will fail with a loss of 125VDC Control Power to Train 'C' Class 1E 4.16KV ESF Bus. The crew will respond using IPOP09-AN-03M2, Window D-1, 125V DC SYSTEM E1C11 TRBL. The SRO will address Tech Spec implications.

Event 5: After the crew has placed E1C11 Battery Charger #2 in service, Condensate Pump #12 will trip and Condensate Pump #11 will not start. The crew will respond using OPOP04-CD-0001, Loss of Condensate Flow. The CIP will direct the crew to trip the Reactor, SGFPs, S/U SGFP and FWBPs.

Event 6: When the Reactor Trips, a LBLOCA will occur. The crew will enter OPOP05-EO-EO00, Reactor Trip or Safety Injection, and then OPOP05-EO-EO10, Loss of Reactor or Secondary Coolant.

Event 7: When the LBLOCA occurs, LHSI Pumps 1A & 1B will fail to auto start and LHSI Pump 1C will not start due to loss of Control Power. The crew will have to manually start a LHSI Pump. **(Critical Task)**

Event 8: When the Refueling Water Storage Tank (RWST) lowers to 75,000 gallons, auto swap over to Emergency Recirculation will fail to occur. The crew will have to manually swap over to Emergency Recirculation per OPOP05-EO-ES13, Transfer to Cold Leg Recirculation. **(Critical Task)**

Termination: The scenario will be terminated when the crew verifies ECCS recirculation flow in OPOP05-EO-ES13, Transfer to Cold Leg Recirculation.

Critical tasks:

- Manually start at least one LHSI Pump before transitioning out of OPOP05-EO-EO00, Reactor Trip or Safety Injection, during a LBLOCA when RCS pressure is less than 400 psig.
- Transfer to Cold Leg Recirculation and establish ECCS recirculation flow prior to RWST level lowering to 32,500 gallons (6% - "RWST EMPTY" alarm) or if RWST level lowers to 32,500 gallons, then stop all pumps taking suction from the RWST, manually align for Cold Leg Recirculation and re-establish ECCS recirculation flow.

Source: New

Facility: South Texas Project Scenario No.: #5 BU Op-Test No.: LOT19 NRC

Examiners: _____ **Operators:** _____

Initial Conditions:

- 100% Power and Stable.

Turnover:

- Train 'A' Outage in progress: HHSI & LHSI Pumps 1A, SI-MOV-0016A and AFW Pump 11.
- Rod Control currently in Manual to perform 0PSP02-RC-0410, Delta T and T Average ACOT, on Channel III.

| Event No. | Malf. No. | Event Type* | Event Description |
|---------------|-------------------------------------|------------------------------|---|
| 1 (0 min) | 05-12-02A 1 | BOP (I) SRO (I, TS) | SG B Controlling Level Channel LT-0572 Fails High. (CT) |
| 2 (10 min) | H1A028_FT 429TVSP 0 | RO (I) SRO (I, TS) | RCS Loop 2 FT-0429 Fails Low. |
| 3 (15 min) | 08-28-03 True | BOP (C) SRO (C) | LPHDP #13 Trips |
| 4 (25 min) | LA10M1- B_2 2 | RO (R) BOP (C) SRO (C) | Main Transformer 1B Trouble, winding temperature and oil temperature rising. |
| 5 (40 min) | 02-01-02 0.6 10-08-01 True | RO (M) BOP (M) SRO (M) | Main Transformer 1B Fault cascades to a complete loss of offsite power and a subsequent LBLOCA. |
| 6 (N/A) | 04-09-11 True | RO (C) SRO (C) | ESF DG #12 Output Breaker fails to close. (Integral to Scenario) |
| 7 (N/A) | 10-12-02 True | RO (C) SRO (C) | Loss of Containment Emergency Recirculation capability. (CT) (Integral to Scenario) |

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

| Target Quantitative Attributes (Per Scenario; See Section D.5.d) | Actual Attributes |
|--|-------------------|
| 1. Total malfunctions (5–8) | 6 |
| 2. Malfunctions after EOP entry (1–2) | 2 |
| 3. Abnormal events (2–4) | 4 |
| 4. Major transients (1–2) | 1 |
| 5. EOPs entered/requiring substantive actions (1–2) | 2 |
| 6. EOP contingencies requiring substantive actions (0–2) | 1 |
| 7. Critical tasks (2–3) | 2 |

STP LOT-19
NRC Scenario #5 BU Description

Initial Conditions: 100% Power and Stable. Train 'A' Outage in progress: HHSI & LHSI Pumps 1A, SI-MOV-0016A and AFW Pump 11. Rod Control currently in Manual to perform 0PSP02-RC-0410, Delta T and T Average ACOT, on Channel III.

Event 1: SG B Controlling Level Channel LT0572 fails high. The crew will respond using 0POP04-FW-0001, Loss of SG Level Control. The SRO will address Tech Spec implications.
(Critical Task)

Event 2: RCS Loop 2 FT-0429 fails low. The crew will respond using 0POP04-RP-0003, Failure of RCS Loop Flow Transmitter. The SRO will address Tech Spec implications.

Event 3: LPHDP #13 trips. The crew will respond using 0POP04-CD-0001, Loss of Condensate Flow.

Event 4: Main Transformer 1B Trouble. The crew will respond using 0POP09-AN-10M1, Window B-2, MAIN XFMR 1B TRBL. Transformer winding temperature and oil temperature will be rising and the crew will begin a load reduction using 0POP04-TM-0005, Fast Load Reduction.

Event 5: After the crew starts to reduce power, the Main Transformer 1B will experience a major fault which will cascade to a complete loss of offsite power. The Unit trip is accompanied with a LBLOCA. The crew will respond using 0POP05-EO-EO00, Reactor Trip or Safety Injection, and then 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant.

Event 6: On the LOOP, ESF DG #12 Output Breaker will fail to close. The crew will secure Diesel Generator #12.

Event 7: While performing 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, Class 1E 480V MCC E1C2 will lose power. Due to the initial conditions and previous events, a loss of Emergency Recirculation capability will occur because the crew will not be able to open any of the 3 Containment Emergency Sump Suction Valves. The crew will respond using Step 20 or the CIP of 0POP05-EO-EO10 and transition to 0POP05-EO-EC11, Loss of Emergency Coolant Recirculation. **(Critical Task)**

Termination: The scenario will terminate after the crew reduces running Containment Spray Pumps per 0POP05-EO-EC11, Loss of Emergency Coolant Recirculation.

Critical Tasks:

- Manually control level in SG 1B such that a manual or automatic Reactor Trip does not unintentionally occur.
- Reduce CS Pumps to minimum such that RWST level is conserved during a loss of Emergency Coolant Recirculation.

Source: New