BWR Examination Outline

| Facility: River Bend Station Date of Exam: 2016 | | | | | | | | | | | | | | | | | | |
|---|---|--|--|--|--|---|--|--|--|--|--|--|--|---|--|---|---|--|
| Tier | Group | | | | I | RO K | (/A (| Categ | jory l | Point | S | | | | SF | RO-01 | nly Po | ints |
| | | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G* | Total | А | 2 | Ģ | 6* | Total |
| 1. | 1 | 3 | 3 | 4 | | | | 4 | 3 | | | 3 | 20 | 4 | 4 | : | 3 | 7 |
| Emergency & Abnormal Plant | 2 | 1 | 1 | 2 | | N/A | | 1 | 1 | N | 'A | 1 | 7 | | 1 | : | 2 | 3 |
| Evolutions | Tier Totals | 4 | 4 | 6 | | | | 5 | 4 | | | 4 | 27 | | 5 | | 5 | 10 |
| 2 | 1 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 26 | 2 | 2 | : | 3 | 5 |
| Plant | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 12 | 0 | 1 | : | 2 | 3 |
| | Tier Totals | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 38 | 4 | 4 | 4 | 4 | 8 |
| 3. Generic | Knowledge and | Abili | ties | | | 1 | | 2 | 3 | 3 | | 4 | 10 | 1 | 2 | 3 | 4 | 7 |
| | Categories | | | | 3 | 3 | | 3 | 2 | 2 | | 2 | | 2 | 1 | 2 | 2 | |
| SR cat fro 2. The poi 3. Sys app tha 3. Sys app tha 4. Set 5. Ab 5. Ab 5. Ab 5. Ab 5. Ab 5. Ab 5. Ab 5. Ab 5. Con 6. Set 7. The rela 8. On (IR tier Ca doc 9. For poi | Coolly outlines agory shall not to m another Tier 3 e point total for e final RO exam stems/evolutions obly at the facility t are not include elimination of in ect topics from a ore selecting a s sent a plant-spece ected. Use the f lect SRO topics e generic (G) K// evant to the applicat totals for each of tegory A2 or G* es not apply). Us Tier 3, select to nt totals (#) on F | (i.e., obe less (i.e., | excess ss th egor grouu p an t tota in ea uld be the copria iers Tier ente copriori and so priori e eve ente from ES-4 | es from the set of the | d tien r may poin group eted ne sh (/A si eor an nly th ratin d 2 fir and 2 fin d 2 fir and 2 fin d 2 fir and 2 fin d 2 fir and 2 fin ages stion 3. Li | r in tli y dev ts ar o are with hould taten and e y sy nose gs fo som t s syst num and f le ab exam s for 2 of mit S | he pi viategoi e Tie he pi viate ha th ider justi l be svolu k/A the s the pi vove; i, end RO a the I SRO | ropos by ± sopos tificati adde s s s s s s s s s s s s s s s s s s | Tier Cada Sed control of the sed | outlin m th outlin m th hly e: the a oppera- coss tion. an in SRC stem from Sec descc s (#) ondlir he lef -only og, a l | the S Cont e mu at sp kam issociation ation to Se tion I riptic for e ng ecc t sidu exa ind ei K/As | samp ance y port ance y port d K/A tion 2 D.1.b on of e ach s juipme e of C ms. nter th that a | A is allow atch that s d in the ta total 25 p outline; s nportant, D.1.b of le every s rating (IR ions, resp categorie of the K/ of the K/ of the S-40 each topic system an ent is sar column A2 ne K/A nu are linked | we the ved if specif able booints syster site-s ES-4 syster (A Ca 1 for t c, the nd cate npled 2 for 7 imber I to 10 | "Tier the K/ fied in based ms or of pecific 01 for m or e 5 or h ely. talog, the ap topics egory. in a c Fier 2, s, des 0 CFR | Total A is ro the ta on NI evoluti guida voluti higher but th plicat ' impo Grou scriptio | able. ⁻ RC rev tions the ems/e ance re on in t - shall ble K/A ortance er the portance ory oth p 2 (N ons, IF 3. | Action of the second terms of te |
| G* Generic | C K/AS | | | | | | | | | | | | | | | | | |

2

| ES-401 Emergency | and | d Ab | B | WR mal | Exan Plant | ninati Evolu | on Outline Form utions - Tier 1/Group 1 (RO / SRO) | ES-40 | 1-1 |
|--|--------|--------|--------|-----------|---------------|-----------------|--|-------|-----|
| E/APE # / Name / Safety Function | K 1 | K 2 | К 3 | A 1 | A2 | G* | K/A Topic(s) | IR | # |
| 295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4 | | | x | | | | Knowledge of the reasons for the following responses as they apply to partial or complete loss of forced core flow circulation: (CFR: 41.5 / 45.6) AK3.02 Reactor power response | 3.7 | 14 |
| 295003 Partial or Complete Loss of AC / 6 | | | | x | | | Ability to operate and/or monitor the following as they apply to partial or complete loss of A.C. power: (CFR: 41.7 / 45.6) AA1.04 D.C. electrical distribution system | 3.6 | 4 |
| 295004 Partial or Total Loss of DC Pwr / 6 | | | | | х | | Ability to determine and/or interpret the following as they apply to partial or complete loss of D.C. power: (CFR: 41.10 / 43.5 / 45.13) AA2.01 Cause of partial or complete loss of D.C. power | 3.2 | 72 |
| 295005 Main Turbine Generator Trip / 3 | | | | | | х | 2.1.19 Ability to use plant computers to evaluate system or component status. (CFR: 41.10 / 45.12) | 3.9 | 9 |
| 295006 SCRAM / 1 | x | | | | | | Knowledge of the operational implications of the following concepts as they apply to SCRAM: (CFR: 41.8 to 41.10) AK1.01 Decay heat generation and removal | 3.7 | 26 |
| 295016 Control Room Abandonment / 7 | | х | | | | | Knowledge of the interrelations between control room abandonment and the following: (CFR: 41.7 / 45.8) AK2.02 Local control stations: Plant-Specific | 4.0 | 36 |
| 295018 Partial or Total Loss of CCW / 8 | | | x | | | | Knowledge of the reasons for the following responses as they apply to partial or complete loss of component cooling water: (CFR: 41.5 / 45.6) AK3.04 Starting standby pump | 3.3 | 16 |
| 295019 Partial or Total Loss of Inst. Air / 8 | | | | х | | | Ability to operate and/or monitor the following as they apply to partial or complete loss of instrument air: (CFR: 41.7 / 45.6) AA1.01 Backup air supply | 3.5 | 17 |
| 295021 Loss of Shutdown Cooling / 4 | | | | | | | | | |
| 295023 Refueling Acc / 8 | | | | | х | | Ability to determine and/or interpret the following as they apply to refueling accidents: (CFR: 41.10 / 43.5 / 45.13) AA2.02 Fuel Pool Level | 3.4 | 47 |
| 295024 High Drywell Pressure / 5 | | | | | | x | 2.2.44 Ability to interpret control room indications to verify status and operation of a system, and understand how operator actions and directives affect plant and system conditions. (CFR: 41.5 / 43.5 / 45.12) | 4.2 | 51 |
| 295025 High Reactor Pressure / 3 | x | | | | | | Knowledge of the operational implications of the following concepts as they apply to high reactor pressure: (CFR: 41.8 to 41.10) EK1.01 Pressure effects on reactor power | 3.9 | 65 |
| 295026 Suppression Pool High Water Temp. / 5 | | x | | | | | Knowledge of the interrelations between suppression pool high water temperature and the following: (CFR: 41.7 / 45.8) EK2.05 Containment pressure: Mark-III | 3.0 | 5 |
| 295027 High Containment Temperature / 5 | | | x | | | | Knowledge of the reasons for the following responses as they apply to high containment temperature (Mark III containment only): (CFR: 41.5 / 45.6) EK3.01 Emergency depressurization: Mark-III | 3.7 | 28 |
| 295028 High Drywell Temperature / 5 | | | | х | | | Ability to operate and/or monitor the following as they apply to high drywell temperature: (CFR: 41.7 / 45.6) EA1.02 Drywell ventilation system | 3.9 | 40 |

3

| ES-401 BWR Examination Outline Form ES-401-1 Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO) | | | | | | | | | | |
|---|--------|--------|--------|--------|-----|-------------------|---|-----|--------------------|--|
| E/APE # / Name / Safety Function | К 1 | К 2 | К 3 | A 1 | A2 | G* | K/A Topic(s) | IR | # | |
| 295030 Low Suppression Pool Wtr Lvl / 5 | | | | | x | | Ability to determine and/or interpret the following as they apply to low suppression pool water level: (CFR: 41.10 / 43.5 / 45.13) EA2.03 Reactor pressure | 3.7 | 46 | |
| 295031 Reactor Low Water Level / 2 | | | | | | х | 2.2.37 Ability to determine operability and/or availability of safety related equipment. (CFR: 41.7 / 43.5 / 45.12) | 3.6 | 19 | |
| 295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1 | x | | | | | | Knowledge of the operational implications of the following concepts as they apply to SCRAM condition present and reactor power above APRM downscale or unknown: (CFR: 41.8 to 41.10) EK1.07 Shutdown margin | 3.4 | 12 | |
| 295038 High Off-site Release Rate / 9 | | x | | | | | Knowledge of the interrelations between high off-site release rate and the following: (CFR: 41.7 / 45.8) EK2.05 Site emergency plan | 3.7 | 75 | |
| 600000 Plant Fire On Site / 8 | | | x | | | | Knowledge of the reasons for the following responses as they apply to plant fire on site: (CFR 41.5,41.10 / 45.6 / 45.13) AK3.04 Actions contained in the abnormal procedure for plant fire on site | 2.8 | 62 | |
| 700000 Generator Voltage and Electric Grid Disturbances / 6 | | | | x | | | Ability to operate and/or monitor the following as they apply to generator voltage and electric grid disturbances: (CFR: 41.5 and 41.10 / 45.5, 45.7, and 45.8) AA1.02 Turbine/generator controls | 3.8 | 6 | |
| 295026 Suppression Pool High Water Temp / 5 | | | | | x | | Ability to determine and/or interpret the following as they apply to Suppression pool high water temp: (CFR:43.2) EA2.01 SP water temp | 4.2 | 92 | |
| 295004 Partial or Total Loss of DC Pwr / 6 | | | | | | x | 2.2.40 Ability to apply Technical Specifications for a system. (CFR:43.5) | 4.7 | 77 | |
| 295005 Main Turbine Generator Trip / 3 | | | | | x | | Ability to determine and/or interpret the following as they apply to main turbine generator trip: (CFR:43.5) AA2.05 Reactor Power | 3.9 | 83 | |
| 295016 Control Room Abandonment / 7 | | | | | | x | 2.4.11 Knowledge of abnormal condition procedures (43.5) | 4.2 | 84 | |
| 295021 Loss of Shutdown Cooling / 4 | | | | | x | | Ability to determine and/or interpret the following as they apply to loss of shutdown cooling: (CFR: 43.5) AA2.02 RHR/shutdown cooling system flow | 3.4 | 80 | |
| 295024 High Drywell Pressure / 5 | | | | | | × | 2.2.36 Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations. (CFR:43.2) | 4.2 | 78 | |
| 295028 High Drywell Temperature / 5 | | | | | x | | Ability to determine and/or interpret the following as they apply to high drywell temperature: (CFR:43.5) A2.01 Drywell temp | 4.1 | 90 | |
| K/A Category Totals: | 3 | 3 | 4 | 4 | 3/4 | 3/ <mark>3</mark> | Group Point Total: | | 20/ <mark>7</mark> | |

4

| ES-401 BWR Examination Outline Form ES-401-1 Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / SRO) | | | | | | | | | | |
|---|--------|--------|--------|--------|--------|-------------------|---|-----|-------------------|--|
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G* | K/A Topic(s) | IR | # | |
| 295002 Loss of Main Condenser Vac / 3 | | | x | | | | Knowledge of the reasons for the following responses as they apply to loss of main condenser vacuum: (CFR: 41.5 / 45.6) AK3.05 Main steam isolation valve: Plant-Specific | 3.4 | 24 | |
| 295007 High Reactor Pressure / 3 | | | | x | | | Ability to operate and/or monitor the following as they apply to high reactor pressure: (CFR: 41.7 / 45.6) AA1.04 Safety/relief valve operation: Plant-Specific | 3.9 | 73 | |
| 295008 High Reactor Water Level / 2 | | | | | | | | | | |
| 295009 Low Reactor Water Level / 2 | | | | | | _ | | | | |
| 295010 High Drywell Pressure / 5 | | | | | | | | | | |
| 295011 High Containment Temp / 5 | | | | | | | | | | |
| 295012 High Drywell Temperature / 5 | | | | | х | | Ability to determine and/or interpret the following as they apply to high drywell temperature: (CFR: 41.10 / 43.5 / 45.13) AA2.02 Drywell pressure | 3.9 | 13 | |
| 295013 High Suppression Pool Temp. / 5 | | | | | | | | | | |
| 295014 Inadvertent Reactivity Addition / 1 | | | | | | | | | | |
| 295015 Incomplete SCRAM / 1 | | | | | | х | 2.4.3 Ability to identify post-accident instrumentation. | 3.7 | 59 | |
| 295017 High Off-site Release Rate / 9 | x | | | | | | Knowledge of the operational implications of the following concepts as they apply to high off-site release rate: (CFR: 41.8) AK1.02 Protection of general public | 3.8 | 35 | |
| 295020 Inadvertent Cont. Isolation / 5 & 7 | | | | | | | | | | |
| 295022 Loss of CRD Pumps / 1 | | | | | | | | | | |
| 295029 High Suppression Pool Wtr Lvl / 5 | | x | | | | | Knowledge of the interrelations between high suppression pool water level and the following: (CFR: 41.7 / 45.8) EK2.08 Drywell/suppression chamber ventilation | 2.6 | 15 | |
| 295032 High Secondary Containment Area Temperature / 5 | | | x | | | | Knowledge of the reasons for the following responses as they apply to high secondary containment area temperature: (CFR: 41.5 / 45.6) EK3.03 Isolating affected systems | 3.8 | 2 | |
| 295033 High Secondary Containment Area Radiation Levels / 9 | | | | | | | | | | |
| 295034 Secondary Containment Ventilation High Radiation / 9 | | | | | | | | | | |
| 295035 Secondary Containment High Differential Pressure / 5 | | | | | | | | | | |
| 295036 Secondary Containment High Sump/Area Water Level / 5 | | | | | | | | | | |
| 500000 High CTMT Hydrogen Conc. / 5 | | | | | | | | 4.0 | 00 | |
| 295020 Inadvertent Cont. Isolation / 5 & 7 | | | | | | Х | steps. (CFR: 41.10 / 43.5 / 45.12) | 4.0 | 90 | |
| 295033 High Secondary Containment Area Radiation Levels / 9 | | | | | X | | Ability to determine and/or interpret the following as they apply to high secondary containment area radiation levels: (CFR: 41.10 / 43.5 / 45.13) EA2.03 Cause of high area radiation | 4.2 | 99 | |
| 500000 High CTMT Hydrogen Conc. / 5 | | | | | | Х | 2.4.6 Knowledge of EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13) | 4.7 | 93 | |
| K/A Category Point Totals: | 1 | 1 | 2 | 1 | 1/1 | 1/ <mark>2</mark> | Group Point Total: | | 7/ <mark>3</mark> | |

5

| ES-401 BWR Examination Outline Form ES-401-1 Plant Systems - Tier 2/Group 1 (RO / SRO) | | | | | | | | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|----|--------|--------|----|--|-----|----|
| System # / Name | K 1 | K 2 | K 3 | К 4 | K 5 | K 6 | A 1 | A2 | A 3 | A 4 | G* | K/A Topic(s) | IR | # |
| 203000 RHR/LPCI: Injection Mode | | x | | | | | | | | | | Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.01 Pumps | 3.5 | 67 |
| 203000 RHR/LPCI: Injection Mode | | | x | | | | | | | | | Knowledge of the effect that a loss or malfunction of the RHR/LPCI: injection mode (plant specific) will have on following: (CFR: 41.7 / 45.4) K3.04 Adequate core cooling | 4.6 | 44 |
| 205000 Shutdown Cooling | | | | x | | | | | | | | Knowledge of shutdown cooling system (RHR shutdown cooling mode) design feature(s) and/or interlocks which provide for the following: (CFR: 41.7) K4.04 Adequate pump NPSH | 2.6 | 64 |
| 209001 LPCS | | | | | x | | | | | | | K5. Knowledge of the operational implications of the following concepts as they apply to LOW PRESSURE CORE SPRAY SYSTEM: (CFR: 41.5 / 45.3) K5.04 Heat removal (transfer) mechanisms | 2.8 | 18 |
| 209002 HPCS | | | | | | x | | | | | | Knowledge of the effect that a loss or malfunction of the following will have on the HIGH PRESSURE CORE SPRAY SYSTEM (HPCS): (CFR: 41.7 / 45.7) K6.02 Condensate Storage Tank Level | 3.4 | 32 |
| 211000 SLC | | | | | | | x | | | | | Ability to predict and/or monitor changes in parameters associated with operating the STANDBY LIQUID CONTROL SYSTEM controls including: (CFR: 41.5 / 45.5) A1.09 SBLC system lineup | 4.0 | 29 |
| 212000 RPS | | | | | | | | x | | | | Ability to (a) predict the impacts of the following on the REACTOR PROTECTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.16 Changing mode switch position | 4.0 | 31 |
| 215003 IRM | | | | | | | | | x | | | Ability to monitor automatic operations of the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM including: (CFR: 41.7 / 45.7) A3.02 Annunciator and alarm signals | 3.3 | 20 |
| 215004 Source Range Monitor | | | | | | | | | | x | | Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.07 Verification of proper functioning/ operability | 3.4 | 8 |
| 215005 APRM / LPRM | | | | | | | | | | | 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 | 22 |
| 217000 RCIC | x | | | | | | | | | | | Knowledge of the physical connections and/or cause/effect relationships between REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.04 Main condenser | 2.6 | 60 |
| 218000 ADS | | | | x | | | | | | | | Knowledge of ADS design features and/or interlocks which provide for the following: (CFR: 41.7) K4.03:ADS logic control | 3.8 | 3 |

6

| ES-401 BWR Examination Outline Form ES-401-1 Plant Systems - Tier 2/Group 1 (RO / SRO) | | | | | | | | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|----|--------|--------|----|--|-----|----|
| System # / Name | К 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A2 | A 3 | A 4 | G* | K/A Topic(s) | IR | # |
| 223002 PCIS/Nuclear Steam Supply Shutoff | | | x | | | | - | | | | | Knowledge of the effect that a loss or malfunction of the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF will have on following: (CFR: 41.7 / 45.4) K3.06 Turbine building radiation | 2.8 | 30 |
| 239002 SRVs | | | | x | | | | | | | | Knowledge of RELIEF/SAFETY VALVES design feature(s) and/or interlocks which provide for the following: (CFR: 41.7) K4.01 Insures that only one or two safety/relief valves reopen following the initial portion of a reactor isolation event (LLS logic): Plant-Specific | 3.9 | 33 |
| 239002 SRVs | | | | | x | | | | | | | Knowledge of the operational implications of the following concepts as they apply to RELIEF/SAFETY VALVES: (CFR: 41.5 / 45.3) K5.05 Discharge line quencher operation | 2.6 | 39 |
| 259002 Reactor Water Level Control | | | | | | x | | | | | | Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR WATER LEVEL CONTROL SYSTEM: (CFR: 41.7 / 45.7) K6.02 A.C. power | 3.3 | 37 |
| 259002 Reactor Water Level Control | | | | | | | х | | | | | Ability to predict and/or monitor changes in parameters associated with operating the REACTOR WATER LEVEL CONTROL SYSTEM controls including: (CFR: 41.5 / 45.5) A1.03 Reactor power | 3.8 | 21 |
| 261000 SGTS | | | | | | | | х | | | | Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.01 Low system flow | 2.9 | 66 |
| 261000 SGTS | | | | | | | | | x | | | Ability to monitor automatic operations of the STANDBY GAS TREATMENT SYSTEM including: (CFR: 41.7 / 45.7) A3.04 System Temperature | 3.0 | 50 |
| 262001 AC Electrical Distribution | | | | | | | | | | x | | Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.03 Local operation of breakers | 3.2 | 68 |
| 262002 UPS (AC/DC) | | | | | | | | | | | х | 2.4.31 Knowledge of annunciator alarms, indications, or response procedures. (CFR: 41.10) | 4.2 | 10 |
| 263000 DC Electrical Distribution | x | | | | | | | | | | | Knowledge of the physical connections and/or cause/effect relationships between D.C. ELECTRICAL DISTRIBUTION and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.01 A.C. electrical distribution | 3.3 | 34 |
| 264000 EDGs | | | x | | | | | | | | | Knowledge of the effect that a loss or malfunction of the EMERGENCY GENERATORS (DIESEL/JET) will have on following: (CFR: 41.7 / 45.4) K3.01 Emergency core cooling systems | 4.2 | 45 |
| 300000 Instrument Air | | x | | | | | | | | | | Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.01 Instrument air compressor | 2.8 | 11 |

7

| ES-401 BWR Examination Outline Form ES-401-7 Plant Systems - Tier 2/Group 1 (RO / SRO) | | | | | | | | | | -401-1 | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|-------------------|--------|--------|-------------------|--|-----|--------------------|
| System # / Name | К 1 | K 2 | К 3 | K 4 | K 5 | K 6 | A 1 | A2 | A 3 | A 4 | G* | K/A Topic(s) | IR | # |
| 300000 Instrument Air | | | | | x | | | | | | | Knowledge of the operational implications of the following concepts as they apply to the INSTRUMENT AIR SYSTEM: (CFR: 41.5 / 45.3) K5.01 Air compressors | 2.5 | 58 |
| 400000 Component Cooling Water | | x | | | | | | | | | | Knowledge of electrical power supplies for the following: (CFR: 41.7) K2.01 CCW Pumps | 2.9 | 38 |
| 215005 APRM / LPRM | | | | | | | | x | | | | Ability to (a) predict the impacts of the following on the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.07 Recirculation flow channels flow mismatch | 3.4 | 96 |
| 239002 SRVs | | | | | | | | | | | x | 2.2.25 Knowledge of bases for Tech Specs for LCOs and safety limits (CFR: 43.2) | 4.2 | 95 |
| 262002 UPS (AC/DC) | | | | | | | | x | | | | Ability to (a) predict the impacts of the following on the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.02 Over voltage | 2.5 | 94 |
| 264000 EDGs | | | | | | | | | | | x | 2.4.20 Knowledge of the operational implications of EOP warnings, cautions, and notes. (CFR: 41.10 / 43.5 / 45.13) | 4.3 | 87 |
| 212000 RPS | | | | | | | | | | | X | 2.2.25 Knowledge of the bases in Tech Specs for LCOs and Safety limits | 4.2 | 88 |
| K/A Category Point Totals: | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2/ <mark>2</mark> | 2 | 2 | 2/ <mark>3</mark> | Group Point Total: | | 26/ <mark>5</mark> |

8

| ES-401 BWR Examination Outline | | | | | | | | | | Form ES- | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|------|--------|----------|--------|---|-----|----|
| 401-1 | | | | Plar | nt Sy | /ste | ms - | Tier | 2/G | irou | p 2 (R | 0 / SRO) | | - |
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A2 | A 3 | A 4 | G* | K/A Topic(s) | IR | # |
| 201001 CRD Hydraulic | | | | | | | | | | | х | 2.2.44 Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions. (CFR: 41.5 / 43.5 / 45.12) | 4.2 | 48 |
| 201002 RMCS | | | | | | | | | | | x | 2.2.42 Ability to recognize system parameters that are entry-level conditions for Technical Specifications. (CFR: 41.7 / 41.10 / 43.2 / 43.3 / 45.3) | 4.6 | 97 |
| 201003 Control Rod and Drive Mechanism | | | | | | | | | | | | | | |
| 201004 RSCS | | | | | | | | | | | | | | |
| 201005 RCIS | | | | | х | | | | | | | Knowledge of the operational implications of the following concepts as they apply to ROD CONTROL AND INFORMATION SYSTEM (RCIS): (CFR: 41.5 / 45.3) K5.09 High power setpoints BWR-6 | 3.5 | 53 |
| 201006 RWM | | | | | | | | | | | | | | |
| 202001 Recirculation | | | | | | | | | | | | | | |
| 202002 Recirculation Flow Control | | | x | | | | | | | | | Knowledge of the effect that a loss or malfunction of the RECIRCULATION FLOW CONTROL SYSTEM will have on following: (CFR: 41.7 / 45.4) K3.05 Recirculation pump speed: Plant-Specific | 3.2 | 71 |
| 204000 RWCU | | | | x | | | | | | | | Knowledge of REACTOR WATER CLEANUP SYSTEM design feature(s) and/or interlocks which provide for the following: (CFR: 41.7) K4.03 Over temperature protection for system components | 2.9 | 23 |
| 214000 RPIS | | | | | | | | | | | | | | |
| 215001 Traversing In-Core Probe | | | | | | | | | | | | | | |
| 215002 RBM | | | | | | | | | | | | | | |
| 216000 Nuclear Boiler Inst. | x | | | | | | | | | | | Knowledge of the physical connections and/or cause/effect relationships between NUCLEAR BOILER INSTRUMENTATION and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.06 Low pressure core spray | 3.9 | 27 |
| 219000 RHR/LPCI: Torus/Pool Cooling Mode | | х | | | | | | | | | | Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.01 Valves | 2.5 | 43 |
| 223001 Primary CTMT and Aux. | | | | | | х | | | | | | Knowledge of the effect that a loss or malfunction of the following will have on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES: (CFR: 41.7 / 45.7) K6.02 Containment cooling: Mark-III | 3.5 | 55 |
| 226001 RHR/LPCI: CTMT Spray Mode | | | | | | | | | | | | | | |
| 230000 RHR/LPCI: Torus/Pool Spray Mode | | | | | | | | | | | | | | |

9

| ES-401 BWR Examination Outline F 401-1 Plant Systems - Tier 2/Group 2 (RO / SRO) | | | | | | | | | | Form ES- | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|-----|--------|----------|-------------------|---|-----|--------------------|
| System # / Name | К 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A2 | A 3 | A 4 | G* | K/A Topic(s) | IR | # |
| 233000 Fuel Pool Cooling/Cleanup | | | | | | | | | | | | | | |
| 234000 Fuel Handling Equipment | | | | | | | | | | | | | | |
| 239001 Main and Reheat Steam | | | | | | | | | | | | | | |
| 239003 MSIV Leakage Control | | | | | | | | | | | | | | |
| 241000 Reactor/Turbine Pressure Regulator | | | | | | | | x | | | | Ability to (a) predict the impacts of the following on the REACTOR/TURBINE PRESSURE REGULATING SYSTEMSYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5) A2.02 High Reactor Pressure | 3.7 | 74 |
| 245000 Main Turbine Gen. / Aux. | | | | | | | | | | | | | | |
| 256000 Reactor Condensate | | | | | | | | | | | | | | |
| 259001 Reactor Feedwater | | | | | | | | | | | | | | |
| 268000 Radwaste | | | | | | | х | | | | | Ability to predict and/or monitor changes in parameters associated with operating the RADWASTE controls including: (CFR: 41.5 / 45.5) A1.01 Radiation level | 2.7 | 41 |
| 271000 Offgas | | | | | | | | | х | | | Ability to monitor automatic operations of the OFFGAS SYSTEM including: (CFR: 41.7 / 45.7) A3.07 Process radiation monitoring system indications | 3.4 | 1 |
| 272000 Radiation Monitoring | | | | | | | | | | | | | | |
| 286000 Fire Protection | | | | | | | | | | | | | | |
| 288000 Plant Ventilation | | | | | | | | | | | | | | |
| 290001 Secondary CTMT | | | | | | | | | | х | | Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.09 System status lights and alarms: Plant-Specific | 3.2 | 69 |
| 290003 Control Room HVAC | | | | | | | | | | | | | | |
| 290002 Reactor Vessel Internals | | | | | | | | | | | х | 2.1.32 Ability to explain and apply system limits and precautions. (CFR: 41.10 / 43.2 / 45.12) | 3.8 | 57 |
| 204000 RWCU | | | | | | | | | | | | | | |
| 234000 Fuel Handling Equipment | | | | | | | | X | | | | Ability to (a) predict the impacts of the following on the FUEL HANDLING EQUIPMENT; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.01 Interlock Failure | 3.7 | 91 |
| 290003 Control Room HVAC | | | | | | | | | | | Х | 2.2.22 Knowledge of limiting conditions for operations and safety limits | 4.7 | 89 |
| K/A Category Point Totals: | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1/1 | 1 | 1 | 2/ <mark>2</mark> | Group Point Total: | | 12/ <mark>3</mark> |

| Facility: River Ber | nd Station | Date of Exam: 2016 | | | | |
|---|------------|--|-----|----|-----|-------|
| Category | K/A # | Торіс | R | 0 | SRO | -Only |
| | | | IR | # | IR | # |
| | 2.1.3 | Knowledge of shift or short-term relief turnover practices. (CFR: 41.10 / 45.13) | 3.7 | 49 | | |
| | 2.1.39 | Knowledge of conservative decision making practices. (CFR: 41.10 / 43.5 / 45.12) | 3.6 | 70 | | |
| 1. Conduct of | 2.1.45 | Ability to identify and interpret diverse indications to validate the response of another indication. (CFR: 41.7 / 43.5 / 45.4) | 4.1 | 7 | | |
| Operations | 2.1.5 | Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc. (CFR: 41.10 / 43.5 / 45.12) | | | 3.9 | 76 |
| | 2.1.42 | Knowledge of new and spent fuel movement procedures. (CFR: 41.10 / 43.7 / 45.13) | | | 3.4 | 100 |
| | Subtotal | | | 3 | | 2 |
| | 2.2.2 | Ability to manipulate the controls as required to operate the facility between shutdown and power levels | 4.6 | 42 | | |
| 2. | 2.2.43 | Knowledge of the process used to track inoperable alarms. (CFR: 41.10 / 43.5) | 3.0 | 52 | | |
| Equipment Control | 2.2.14 | Knowledge of the process for controlling equipment configuration or status. (CFR: 41.10 / 43.3 / 45.13) | 3.9 | 25 | | |
| Control | 2.2.38 | Knowledge of conditions and limitations in the facility license. (CFR: 41.7 / 41.10 / 43.1 / 45.13) | | | 4.5 | 86 |
| | Subtotal | | | 3 | | 1 |
| | 2.3.4 | Knowledge of radiation exposure limits under normal or emergency conditions. (CFR: 41.12 / 43.4 / 45.10) | 3.2 | 61 | | |
| | 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. | 3.2 | 54 | | |
| 3. Radiation Control | 2.3.5 | Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc. (CFR: 41.11 / 41.12 / 43.4 / 45.9) | | | 2.9 | 79 |
| | 2.3.15 | Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc. (CFR: 41.12 / 43.4 / 45.9) | | | 3.1 | 81 |
| | Subtotal | | | 2 | | 2 |
| | 2.4.12 | Knowledge of general operating crew responsibilities during emergency operations | 4.0 | 63 | | |
| 4. Emergency Procedures / Plan | 2.4.21 | Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc. (CFR: 41.7 / 43.5 / 45.12) | 4.0 | 56 | | |
| | 2.4.32 | Knowledge of operator response to loss of all annunciators. (CFR: 41.10 / 43.5 / 45.13) | | | 4.0 | 82 |

11

| Facility: River Ber | nd Station | Date of Exam: 2016 | | | | |
|---------------------|------------|---|----|----|-----|-------|
| Category | K/A # | Торіс | R | 0 | SRO | -Only |
| | | | IR | # | IR | # |
| | 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 | 85 |
| | Subtotal | | | 2 | | 2 |
| Tier 3 Point Total | | | | 10 | | 7 |

| Tier / Group | Randomly Selected K/A | Reason for Rejection |
|-----------------|--------------------------|--|
| | | Rejected KAs were not tracked since this was NRC written and the majority of the exam required new questions to be written for the randomly selected KAs because they did not have previously written questions in the facility licensee's bank. |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| Facility: River Bend Nuclear Station Examination Level: RO 🛛 SRO 🗌 | | Date of Examination: <u>9/12/2016</u> Operating Test Number: <u>LOT-2016</u> | |
|---|---------------|---|--|
| Administrative Topic (see Note) | Type Code* | Describe activity to be performed | |
| Conduct of Operations | R – N | CRD pump clearance | |
| Conduct of Operations | R – N | Calculation for leakage | |
| Equipment Control | R – N | Electrical Print Reading (Determine effect of removing fuses in RPS system) | |
| Radiation Control | R – N | Determine emergency entry requirements for high dose | |
| Emergency Plan | | | |
| NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required. | | | |
| * Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1; randomly selected) | | | |

| Facility: <u>River Ben Nuclear Station</u> Examination Level: RO SRO 🛛 | | Date of Examination: <u>9/12/2016</u> Operating Test Number: <u>LOT-2016</u> | |
|--|---------------|---|--|
| Administrative Topic (see Note) | Type Code* | Describe activity to be performed | |
| Conduct of Operations | R - N | Print Reading (RPS fuse removal) | |
| Conduct of Operations | R - N | Leakage calculation and TS call associated with leakage. | |
| Equipment Control | R – N | Evaluate a CRD pump clearance | |
| Radiation Control | R - N | Emergency entry for high dose and who authorizes the entry. | |
| Emergency Plan | R - N | Emergency Classification | |
| NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required. | | | |
| * Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1; randomly selected) | | | |

| Facility: Exam L | Facility: RIVER BEND NUCLEAR STATION Date of Examination: 9/12/2016 Exam Level: RO SRO-I SRO-U Operating Test No.: LOT 2016 | | | | | |
|---------------------|---|-------------|---------------|--------------------|--|--|
| Control | Room Systems* 8 for RO; 7 for SRO-I; 2 or | 3 for SRO-U | | | | |
| | System / JPM Title | | Type Code* | Safety Function | | |
| S1. | Perform Rod Withdrawal Limiter Test with a inadvertent closure. | a MSIV | A - N - S - L | 1 | | |
| S2. | Align SU FRV and controller drifts open. | | A - N – S - L | 2 | | |
| S3. | Open MSIVs per SOP-011. | | M - S - L | 3 | | |
| S4. | S4. Align Division 3 DG to power ENS-SWGR1A (fault occurs requiring alignment to ENS-SWGR1B) EN - N - S 4 | | | | | |
| S5. | . SBGT fails to start with dampers fail to open. A - EN - N - S 9 | | | 9 | | |
| S6. | Swap electrical bus power supplies N - S 6 | | | 6 | | |
| S7. | Z. Drive In IRM/SRM Detectors Following a SCRAM D - S - L | | | 7 | | |
| S8. | . Start RHR in Suppression Pool Cooling Mode with high pump amps. (FIX PAPERWORK) A - D - EN - S - L 5 | | | 5 | | |
| In-Plant | In-Plant Systems [*] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U) | | | | | |
| P1. | P1. CRD filter swap with new filter clogged (CR-2016-1724) A - N - R 1 | | | 1 | | |
| P2. | 2. ATC actions to Man the RSP. AOP 31 Att 12 Section 1.1.4- 1.1.6 N - E - L 2 | | | 2 | | |
| P3. | Instrument Air Diesel Air compressor backup to safety D - E - P - R 8 | | | 8 | | |
| * | * All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all five SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room. | | | | | |
| | * Type Codes Criteria for RO / SRO-I / SRO-U | | | | | |

| (A)Iternate path | 4-6 / 4-6 / 2-3 |
|---|--|
| (D)irect from bank | ≤9/≤8/≤4 |
| (E)mergency or abnormal in-plant | ≥1/≥1/≥1 |
| (EN)gineered safety feature | ≥1 / ≥1 / ≥1 (control room system) |
| (L)ow-Power / Shutdown | ≥1/≥1/≥1 |
| N)ew or (M)odified from bank including 1(A) | ≥2/≥2/≥1 |
| (P)revious 2 exams | $\leq 3 / \leq 3 / \leq 2$ (randomly selected) |
| (R)CA | ≥1/≥1/≥1 |
| (S)imulator | |
| | |

S1 Need to snap an IC in the HLO Load with the appropriate power and a valid RMP Indicate the next rod to be pulled in the JPM Markup a copy of GOP-1 including SRM counts and calculations

- S2 Align Gabe's version and Dave's
- S3 Modified from Audit JPM: RJPM-AUD-D14-S1, Re-Open MSIVs Following Automatic Isolation Ready for Review

S4

| JPM IC Pairings | 5 ICs will be required: | | |
|-----------------|-------------------------|---------------------------|--|
| S1 – S6 | 680 - 601 | 100% | |
| S5 - S7 | 863 - 680 | post scram | |
| S2 – S8 | 680 - 601 | post scram | |
| S3 | 601 | same IC as S1 and S8 | |
| S4 | 601 | low power above critical, | |

| Appendix D | Scenario Outline | Form ES-D-1 |
|--|--|----------------------------------|
| | NRC 2016 Scenario 1 | Page 1 of 7 |
| Facility: <u>River Bend Nu</u> | clear Station Scenario No.: 1 | Op-Test No.: <u>NRC LOT 2016</u> |
| Examiners: | Operators: | |
| | | |
| | | |
| Initial Conditions: Operati | ing at 100% power. | |
| Inoperable Equipment: N | one | |
| <u>Turnover:</u> | | |
| Severe Thunderstorm war (Severe Weather Operation | rning in effect for West Feliciana in effect. on) are complete. | All required actions per AOP-29 |
| Scenario Notes: | | |
| This scenario is a NEW S | cenario. | |
| Validation Time: 60 minut | es | |
| | | |

Scenario Outline

Form ES-D-1

NRC 2016 Scenario 1

Page 2 of 7

| Event No. | Malf. No. | Event Type [†] | Event Description | |
|--------------|---|----------------------------|---|--|
| 1 | HPCS004 | C (BOP) TS (CRS) AOP | HPCS Inadvertent Initiation. AOP 6, Condensate/Feedwater Failures. TS 3.5.1 | |
| 2 | | C (ATC) AOP | Degraded Grid. Adjust MVARs per AOP 64, Degraded Grid. ARP 680-P808-86-H-1. | |
| 3 | MGEN005A | C (BOP) | Isophase Bus Duct Cooling Fan Trips. SOP 67, Isolated Phase Bus Duct Cooling System. ARP P870-54-B-1 | |
| 4 | AOFWS- A03-M | C (ATC) R (ATC) AOP | FWS Pump A motor failure (amps increasing/secure pump). AOP 6, Condensate/Feedwater Failures. AOP 24, Thermal Hydraulics Stability Controls. ARP P808-86-H-1, p680-3-C-1. | |
| 5 | P680-6A- IA_8 (1/2 scram signal) | TS (CRS) | SDV level instrument fails high 1 of 4 instruments. TS 3.3.1.1. ARP P680-5-B-10, P680-5-A-10, P680-6-A-8 | |
| 6 | ED002B | M (CREW) | NPS-B Fault/Trip. Complete loss of feedwater. RCIC trips due to malfunction. EOP 1 | |
| 7 | WCS006 | M (CREW) | RWCU line break in the steam tunnel 100 gpm ramp for 3 minutes after mode switch taken to shutdown. ARPs P601-21-A-1, P601-21-A-6, P601-21-B-1, P601-21-A-3, P601-21-B-3. EOP 3 | |
| 8 | WCS004 WCS005 | С | G33-MOV-1 and G33-MOV-4 fail to auto close | |
| 9 | MSS024D MSS025D | С | MSIVs (C-B21-AOVF022D and C-B21-AOVF028D) fail to auto close | |
| † | † (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (A)bnormal (TS) Tech Spec | | | |

| Quantitative Attributes Table | | | |
|---|---|---------------------------------|----|
| Normal Events | 2 | EOP Contingency Procedures Used | 1 |
| Total Malfunctions | 7 | Simulator Run Time | 60 |
| Malfunctions After EOP Entry | 2 | EOP Run Time | 30 |
| AOP Events | 3 | Critical Tasks | 4 |
| Major Transients | | Reactivity Manipulations | 1 |
| EOPs Used (Requiring measurable action) | 2 | | |

Scenario Outline

Form ES-D-1

Page 3 of 7

NRC 2016 Scenario 1

SCENARIO ACTIVITIES:

HPCS Inadvertent Initiation:

- A. After turnover and at the direction of the lead evaluator trigger *Event 1*.
- B. The Unit Operator will override HPCS off. This will prevent further automatic initiation.

Degraded Grid:

- A. After CRS enters TS 3.5.1 and/or at the direction of the lead evaluator trigger *Event* 2.
- B. CRS will enter AOP 64 and dispatcher will notify control room to adjust MVARs.
- C. MVARs will initially be 250 MVARs. ATC adjusts MVARs to 200 MVARs per AOP 64, Degraded Grid and ARP 680-P808-86-H-1.

Isophase Bus Duct Cooling Fan Trips:

- A. After ATC adjusts MVARs and/or at the direction of the lead evaluator trigger *Event 3.*
- B. The Unit Operator will restart Isophase Bus Duct Cooling Fan per SOP 67, Isolated Phase Bus Duct Cooling System and ARP P870-54-B-1.

FWS Pump A Motor Failure:

- A. After Unit Operator restarts Isophase Bus Duct Cooling Fan and/or at the direction of the lead evaluator trigger *Event 4.*
- B. The ATC will recognize the increasing FW motor amps and secure the FWS Pump A per AOP 6 (Condensate/Feedwater Failures), AOP 24 (Thermal Hydraulics Stability Controls), ARP P808-86-H-1, and ARP P680-3-C-1.
- C. An automatic flow control valve runback will occur when the pump is tripped.

SDV level instrument fails high:

A. After ATC trips the FWS Pump A and/or at the direction of the lead evaluator trigger *Event 5.*

NKC

NRC



NRC

NRC



| Appendix D | Scenario Outline | Form ES-D-1 |
|------------|---------------------|-------------|
| | NRC 2016 Scenario 1 | Page 4 of 7 |

B. 1 of 4 SDV level instruments fails high. CRS enters TS 3.3.1.1.

NPS-B Fault/Trip, Complete loss of feedwater, RCIC malfunction:

A. After CRS enters TS 3.3.1.1 and/or at the direction of the lead evaluator trigger *Event 6.*

NKC

- B. Crew will manually scram the reactor due to the complete loss of feedwater. The automatic RPS scram will occur at 9.7" reactor water level if manual action is not taken first.
- C. Crew will restore HPCS injection to maintain reactor water level in expanded level band.

RWCU line break in the steam tunnel:

- A. 3 minutes after automatic or manual scram, *Event* 7 will automatically trigger.
- B. Indications of high temperatures in the steam tunnel will cause isolation signals. G33-MOV-1 and G33-MOV-4 will fail to auto close and MSIVs (C-B21-AOVF022D and C-B21-AOVF028D) will fail to auto close.
- C. Crew will shut the failed isolation valves.

Scenario Outline

Form ES-D-1

NRC 2016 Scenario 1

Page 5 of 7

| | Critical Task | | | | |
|---|---|-------|--|--|--|
| Number | Description | Basis | | | |
| 1 | Close one RWCU isolation valve (G33- MOV-1 OR G33-MOV-4) after failure to close on group 15 isolation before completion of step 5.9 of AOP-3 | | | | |
| 2 | Restore HPCS injection prior to Emergency Depressurization. | | | | |
| * Critical Task (As defined in NUREG 1021 Appendix D) | | | | | |

Simulator Notes:

Prior to scenario, ensure GML Fan 1 is running

Prior to scenario, adjust MVAR to 250 MVARs

Event 4, get to 360 amps quicker and then ramp to 440 amps slower.

Event 8, need to delete leak once valve is closed.

Provide graphic for the SPI-REC102 to indicate values consistent with grid.

Screen C11NC036 needs to indicate one trip unit in TRIP.

When restoring HPCS during leak, if asked to fill and vent system, expedite the process.

| Appendix D | 8 | Scenario Outline | Form ES-D-1 |
|-------------------------------|-----------------------------------|------------------------------|----------------------------------|
| | NF | C 2016 Scenario 2 | Page 1 of 7 |
| Facility: R | liver Bend Nuclear Station | Scenario No.: 2 | Op-Test No.: <u>NRC LOT 2016</u> |
| Examiners: | | Operators: | |
| | | | |
| | | | ······ |
| Initial Conditi | ons: Operating at 100% po | wer. | |
| Inoperable E | <u>quipment:</u> None | | |
| <u>Turnover:</u> | | | |
| Severe Thun are complete | derstorm warning in effect f | or West Feliciana in effect. | All required actions per AOP-29 |
| Main Turbine previous shif | e experienced increased (ap t. | proximately 1 mil higher tha | n normal) turbine vibrations on |
| Scenario Not | tes: | | |
| This scenario | o is a NEW Scenario. | | |
| Validation Ti | me: 60 minutes | | |
| | | | |

Scenario Outline

Form ES-D-1

NRC 2016 Scenario 2

Page 2 of 7

| Event No. | Malf. No. | Event Type [†] | Event Description |
|--------------|---|---------------------------------------|---|
| 1 | MSS010 | C (BOP) | Gland Seal Steam Supply Failure. ARP P870-54-E-05 |
| 2 | RHSAOV64 | C (BOP) TS (CRS) AOP | RHS isolation failure. ARP P870-56A-H-03. AOP-3 (Automatic Isolations). TS 3.3.6.2 |
| 3 | RCS015B | C (ATC) R (ATC) TS (CRS) AOP | NJS-J malfunction. MFP A trip. FCV runback. B FCV fails to runback. Recirculation flow mismatch. AOP 6 (Condensate / Feedwater failures). AOP 14 (Loss of 125VDC). TS 3.4.1 |
| 4 | ED004J | M (ATC) | Main Turbine Vibrations increase to manual scram level. EOP 1A (RPV Control, ATWS). OSP-53. |
| 5 | CRD014 | M (CREW) | Hydraulic ATWS 65%. EOP 1A (RPV Control, ATWS). |
| 6 | SLC002A | С | SLC Pump Failure. |
| 7 | MSS005E | С | SRV (47B) stuck open. |
| † | † (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (A)bnormal (TS) Tech Spec | | |

| Quantitative Attributes Table | | | | |
|---|---|---------------------------------|----|--|
| Normal Events | 0 | EOP Contingency Procedures Used | 1 | |
| Total Malfunctions | 5 | Simulator Run Time | 60 | |
| Malfunctions After EOP Entry | 2 | EOP Run Time | 30 | |
| AOP Events | 2 | Critical Tasks | 2 | |
| Major Transients | 2 | Reactivity Manipulations | 1 | |
| EOPs Used (Requiring measurable action) | 1 | | | |

Scenario Outline

Form ES-D-1

NRC 2016 Scenario 2

Page 3 of 7

SCENARIO ACTIVITIES:

Gland Seal Steam Supply Failure:

- A. After turnover and at the direction of the lead evaluator trigger *Event 1*.
- B. The Unit Operator will throttle open TME-MOVS2 SSE PRESS REG BYP VLV to restore seal steam header pressure per ARP P870-54-E-05.

RHS isolation failure:

- A. After seal steam header pressure is restored and/or at the direction of the lead evaluator trigger *Event 2*.
- B. The Unit Operator will close RHS-AOV64, SPC Discharge Valve due to failure to isolate per ARP P870-56A-H-03 and AOP-3 (Automatic Isolations).
- C. The CRS will enter TS 3.3.6.2.

NJS-J malfunction:

- A. After RHS-AOV64 is closed, TS 3.3.6.2 entered, and/or at the direction of the lead evaluator trigger *Event 3*.
- B. FWP A will trip. An automatic FCV runback will occur. The B FCV fails to runback. A large Recirculation flow mismatch will result.
- C. The Unit Operator will manually runback the B FCV to eliminate the flow mismatch per AOP 6 (Condensate / Feedwater failures) and AOP 14 (Loss of 125VDC).
- D. The CRS will enter TS 3.4.1.

Main Turbine Vibrations:

- A. After the B FCV has been manually runback, TS 3.4.1 entered, and/or at the direction of the lead evaluator trigger *Event 4*.
- B. Vibrations continue to increase to 12 mils which require a manual scram and turbine trip per OSP-53.

ATWS:

- A. After the ATC manually scrams the reactor, a 65% Hydraulic ATWS will occur automatically.
- B. The crew will install EOP attachments and drive the control rods in.



NRC





| Ар | pen | ndix | D |
|----|-----|------|---|
|----|-----|------|---|

NRC 2016 Scenario 2

Page 4 of 7

SLC Pump Failure:

- A. The first SLC pump started will have an automatic malfunction resulting in a failure to inject.
- B. The second SLC pump will operate normally and inject boron as required.

SRV (47B) stuck open:

A. SRV (47B) will automatically open upon the reactor scram. The valve will shut when the hand switch is manually taken to close.

Scenario Outline

Form ES-D-1

NRC 2016 Scenario 2

Page 5 of 7

| Critical Task | | | | |
|---|---|-------|--|--|
| Number | Description | Basis | | |
| 1 | Terminate and prevent all injection sources except boron injection, CRD and RCIC prior to exceeding HCTL. | | | |
| 2 | Inject SLC prior to suppression pool temperature reaching 110F. | | | |
| * Critical Task (As defined in NUREG 1021 Appendix D) | | | | |

Simulator Notes: For the increased turbine vibrations: TMS003 2 on initiate TMS003 raise to 8.5 over 5 minutes Event 2 needs a trigger to remove RHS AOV 64 malfunction.

| Appendix D Scenario Outline | | Form ES-D-1 |
|--------------------------------------|---|----------------------------------|
| | NRC 2016 Scenario 3 | Page 1 of 7 |
| Facility: <u>River Bend N</u> | uclear Station Scenario No.: <u>3</u> | Op-Test No.: <u>NRC LOT 2016</u> |
| Examiners: | Operators: | |
| | | |
| Initial Conditions: Operat | ting at 100% power. | |
| | | |
| Inoperable Equipment: N | lone | |
| <u>Turnover:</u> | | |
| Severe Thunderstorm wa are complete. | rning in effect for West Feliciana in effect. | All required actions per AOP-29 |
| RPS B power supply is or | n alternate due to repairs to B RPS MG se | .t. |
| STP-203-6305 is in progr | ess commence on step 7.6.3. | |
| Scenario Notes: | | |
| This scenario is a NEW S | Scenario. | |
| Validation Time: 60 minut | tes | |
| | | |

Scenario Outline

Form ES-D-1

NRC 2016 Scenario 3

Page 2 of 7

| Event No. | Malf. No. | Event Type [†] | Event Description | | |
|---|--------------------|--------------------------------|--|--|--|
| 1 | HPCS001 | N (BOP) TS (CRS) | HPCS STP. HPCS pump trip. STP-203-6305. TS 3.5.1. ARP P601-16-B-3, P601-16-F-5, and P601-16-G-4. | | |
| 2 | ED003I | C (BOP/ATC) TS (CRS) AOP | ENS SWGR B lockout. Loss of alternate RPS power supply. Power supply switched back to normal and half scram reset. AOP 10 (Loss of RPS Bus). ARP P877-32-C-3, P877-32-E- 1, P877-32-E-2, P877-32-F-2, P877-32-G-1, P877-32-H-3, and P877-32-H-4. | | |
| 3 | RCS005A RCS002A | C (ATC) TS (CRS) AOP | Recirc pump seal leak, pump trip, (ATC reduces flow <33kgpm). ARP P680-4-E-5. GOP-4. AOP-24. | | |
| 4 | RCS001A | M (CREW) | Seal leak increases. THI increases and requires manual scram. ARP P680-6-C-1, P680-7-A-5, P680-7-A-6, P680-7-B-5, and P680-7-B-6. AOP-1. EOP-1. | | |
| 5 | | M (CREW) | Loss of offsite power. Loss of feedwater. RCIC trips on overspeed. Failure of Division 2 DG to energize ENS SWGR-1B. | | |
| 6 | | С | RHR 'A' pump fails to start | | |
| 7 | | С | LPCS injection valve fails to open | | |
| † (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (A)bnormal (TS) Tech Spec | | | | | |

| Quantitative Attributes Table | | | | |
|---|---|---------------------------------|----|--|
| Normal Events | 1 | EOP Contingency Procedures Used | 1 | |
| Total Malfunctions | 5 | Simulator Run Time | 60 | |
| Malfunctions After EOP Entry | 2 | EOP Run Time | 30 | |
| AOP Events | 2 | Critical Tasks | 3 | |
| Major Transients | 2 | Reactivity Manipulations | 1 | |
| EOPs Used (Requiring measurable action) | 1 | | | |

Form ES-D-1

NRC 2016 Scenario 3

Page 3 of 7

NRC

NRC

NKC

SCENARIO ACTIVITIES:

HPCS pump trip:

- A. After turnover the Unit Operator will perform STP-203-6305. During the performance of the STP the HPCS pump will *automatically trip (Event 1)*. The Unit operator should secure HPCS STP lineup per ARP P601-16-B-3, P601-16-F-5, and P601-16-G-4.
- B. CRS should enter TS 3.5.1.

ENS SWGR B lockout:

- A. After the Unit Operator secures HPCS, CRS enters TS 3.5.1, and/or at the direction of the lead evaluator trigger *Event 2*.
- B. The ENS SWGR B lockout will result in loss of alternate RPS power supply and a division 2 half scram.
- C. The Unit Operator will switch the power supply back to normal and the ATC will reset the half scram. AOP 10 (Loss of RPS Bus). ARP P877-32-C-3, P877-32-E-1, P877-32-E-2, P877-32-F-2, P877-32-G-1, P877-32-H-3, and P877-32-H-4.
- D. The CRS will enter TS 3.8.1.

Recirculation pump seal leak:

- A. After the Unit Operator swaps the RPS power supply and has completed AOP-10 through step 13 of Attachment 2, the ATC resets the Division 2 half scram, the CRS enters TS XXX, and/or at the direction of the lead evaluator trigger *Event 3*.
- B. The A Recirculation pump #1 seal will degrade.
- C. After the crew diagnosis of the seal failure and/or at the direction of the lead evaluator, trigger *Event 4* to trip the Recirculation Pump.
- D. The ATC will be required to reduce flow to < 33 kgpm and monitor for THI. ARP P680-4-E-5. GOP-4. AOP-24.
- E. The CRS will enter TS XXX.

| Appendix D | Scenario Outline | Form ES-D-1 |
|------------|---------------------|-------------|
| | NRC 2016 Scenario 3 | Page 4 of 7 |

Thermal Hydraulic Instability:

A. After the ATC reduces flow to < 33 kgpm, the CRS enters TS 3.5.1, and/or at the direction of the lead evaluator trigger *Event 5*.

NRC

B. THI power swings get bigger and requires manual scram. ARP P680-6-C-1, P680-7-A-5, P680-7-A-6, P680-7-B-5, and P680-7-B-6. AOP-1. AOP-24. EOP-1.

- A. After the manual scram, *Event 6 will automatically occur*.
- B. The loss of offsite power will result in a loss of all feedwater. RCIC will trip on overspeed. The Division 2 DG will fail to energize ENS SWGR-1B.
- C. Due to a loss of all high pressure injection sources, the crew will be forced to emergency depressurize and inject with low pressure ECCS systems.

RHR 'A' pump fails to start:

- A. The RHR A pump will fail to auto start after automatic initiation. *Automatic trigger Event 7.*
- B. The crew will manually start the RHR 'A' pump to assist restoring reactor water level. RHR alone will not be enough to restore reactor water level. LPCS will be required as well.

LPCS injection valve fails to open:

- A. The LPCS injection valve will fail to open after automatic initiation and emergency depressurization. *Automatic trigger Event 8.*
- B. The crew will manually open the LPCS injection valve to assist restoring reactor water level. LPCS alone will not be enough to restore reactor water level. RHR will be required as well.

Scenario Outline

Form ES-D-1

NRC 2016 Scenario 3

Page 5 of 7

| Critical Task | | | | |
|---------------|--|-----------|--|--|
| Number | Description | Basis | | |
| 1 | Mode switch to shutdown prior <mark>to 100%</mark> oscillations on an APRM channel. | | | |
| 2 | Emergency Depressurize prior to -185 inches compensated fuel zone. | | | |
| 3 | Manually start RHR A pump and open LPCS injection valve prior to transitioning to RPV flooding or entering SAPs. | | | |
| * C | ritical Task (As defined in NUREG 1021 App | pendix D) | | |

Simulator Notes:

RPS B in alternate using the key switch in the back. Set up the IC rod line to ensure when the recirc pump trips the crew is deep in the restricted region. Make the recirc loop rupture big enough not to be turned by RHR alone. Should not get the ventilation alarms.

| Appendix D | Scenario Outline | Form ES-D-1 |
|--|--|----------------------------------|
| | NRC 2016 Scenario 4 | Page 1 of 3 |
| Facility: <u>River Bend N</u> | uclear Station Scenario No.: 4 | Op-Test No.: <u>NRC LOT 2016</u> |
| Examiners: | Operators: | |
| | | |
| | | |
| Initial Conditions: Operat | ting at 4% power. | |
| Inoperable Equipment: N | lone | |
| <u>Turnover:</u> Continue withdrawing roc | ls to achieve mode 1. | |
| Severe Thunderstorm wa are complete. | arning in effect for West Feliciana in effect. A | All required actions per AOP-29 |
| Scenario Notes: | | |
| This scenario is a NEW S | Scenario. | |
| Validation Time: 60 minut | tes | |
| | | |

Scenario Outline

Form ES-D-1

NRC 2016 Scenario 4

Page 2 of 3

| Event No. | Malf. No. | Event Type [†] | Event Description | |
|---|-------------------------------------|----------------------------|--|--|
| 1 | CRDM2449 | C (ATC) TS (CRS) AOP | Rod 24-49 Drifts out. ARP P680-7-B-2 and P680-7-C-1. AOP-61 (Control Rod Mispositioned / Malfunction). TS 3.1.3 | |
| 2 | NMS006E | C (ATC) | IRM E fails upscale. Bypass IRM. ARP P680-6-C-10. | |
| 3 | | C (BOP) | CRD pump trip. BOP starts other CRD pump. ARP P601- 22-A-1, P601-22-B-1, P601-22-F-1, and P680-7-D-1 | |
| 4 | | C (BOP) AOP | CCS pump trip. Standby fails to auto start. AOP-12 (Loss of Turbine Plant Component Cooling Water) | |
| 5 | RMS005C | C (BOP) | Rad monitor fails. HVF-AOD-104, HVF-AOD-122 and HVF- AOD-102 fail to auto close. | |
| 6 | NMS007A | TS (CRS) | IRM A fails downscale. ARP P680-6-C-9. | |
| 7 | ED001 DG001B DG002C RCS007 | М | Station Blackout. Loss of offsite power. Loss of feed. Reactor scram. Division 2 and 3 DGs fail. EOP 1. Drywell leak 200 gpm | |
| 8 | DG006A | С | Division 1 DG voltage is low and needs to be raised in order to energize the bus. | |
| 9 | | С | RCIC manual initiation fails. RCIC must be manually aligned per hardcard. | |
| † (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (A)bnormal (TS) Tech Spec | | | | |

| Quantitative Attributes Table | | | | |
|---|---|---------------------------------|----|--|
| Normal Events | 0 | EOP Contingency Procedures Used | 1 | |
| Total Malfunctions | 8 | Simulator Run Time | 60 | |
| Malfunctions After EOP Entry | 2 | EOP Run Time | 30 | |
| AOP Events | 1 | Critical Tasks | 2 | |
| Major Transients | 1 | Reactivity Manipulations | 1 | |
| EOPs Used (Requiring measurable action) | 1 | | | |

Scenario Outline

Form ES-D-1

NRC 2016 Scenario 4

Page 3 of 3

NKC

NRC

NRC

SCENARIO ACTIVITIES:

Rod 24-49 Drifts out:

- A. After turnover the ATC will continue with the rod withdraw to transition to mode 1. The rods will be withdrawn one notch at a time. On the second notch withdraw, *Event 1 will automatically insert* a continuous rod withdraw for rod 24-49.
- B. The ATC will recognize the continuous withdraw and fully insert the rod until it is locally isolated to maintain fully inserted per ARP P680-7-B-2, P680-7-C-1, and AOP-61 (Control Rod Mispositioned/ Malfunction)
- C. CRS should enter TS 3.1.3.

IRM E fails upscale:

- A. After the rod is isolated, CRS enters TS 3.1.3, and/or at the direction of the lead evaluator trigger *Event 2*.
- B. The ATC will bypass IRM E per ARP P680-6-C-10.

CRD pump trip:

- A. After the IRM is bypassed and/or at the direction of the lead evaluator trigger *Event* 3.
- B. The running CRD pump will trip and the other CRD pump does not have a standby feature.
- C. The Unit Operator will manually start the other CRD pump per ARP P601-22-A-1, P601-22-B-1, P601-22-F-1, P680-7-D-1.

CCS pump trip:

- A. After the CRD pump is started and/or at the direction of the lead evaluator trigger *Event 4*.
- B. The running CCS pump will trip and the standby pump fails to start.
- C. The Unit Operator will manually start the standby CCS pump per AOP-12 (Loss of Turbine Plant Component Cooling Water).

| Appendix D | Scenario Outline | Form ES-D-1 |
|------------|---------------------|-------------|
| | NRC 2016 Scenario 4 | Page 4 of 3 |

Rad monitor fails:

A. After the CCS pump is started and/or at the direction of the lead evaluator trigger *Event 5.*

NRC

NRC.

NRC.

- B. The rad monitor fails and HVF-AOD-104, HVF-AOD-122 and HVF-AOD-102 fail to auto close. ARP-RMS-DSP230/4GE005
- C. The Unit Operator manually closes the three valves.

IRM A fails downscale:

- A. After the three HVF dampers are shut and/or at the direction of the lead evaluator, trigger *Event 6.*
- B. The CRS will enter TS 3.3.1.1.

Station Blackout:

- A. After the CRS enters TS 3.3.1.1 and/or at the direction of the lead evaluator trigger *Event 7.*
- B. A loss of offsite power will result in a complete loss of feed and an automatic reactor scram on low reactor water level. Division 2 and 3 Diesel Generators will malfunction and not start. A slow drywell leak will occur.

Division 1 Diesel Generator fails to energize ENS-SWGR1A:

- A. Upon the loss of offsite power, Event 8 will automatically trigger.
- B. The Division 1 Diesel Generator will fail to reach voltage required to automatically energize ENS-SWGR1A.
- C. The crew will manually raise diesel voltage and energize ENS-SWGR1A.

RCIC manual initiation fails:

- A. Manual initiation of RCIC using the manual pushbutton will not work, *Event 9 will automatically trigger*.
- B. The crew will manually align RCIC per the hardcard.

Scenario Outline

Form ES-D-1

NRC 2016 Scenario 4

Page 5 of 3

| Critical Task | | |
|---|---|-------|
| Number | Description | Basis |
| 1 | Adjust division 1 voltage to energize ENS SWGR A within 10 minutes or if shutdown, then once fill and vent of LP ECCS systems are complete, restart and power ENS SWGR A prior to auto trip on high temperature. | |
| 2 | Manually start RCIC prior to RPV level reaching -187 inches compensated fuel zone. | |
| * Critical Task (As defined in NUREG 1021 Appendix D) | | |

Simulator Notes:

Provide and mark up GOP 1 and reactivity plan.

Rod drift inserted on first rod of plan. The rod selected should be one that requires being at 48 inches. This will prevent an issue with the rod pattern controller. Insert the rod drift on the second notch withdraw.

CRD006 Reset CRDM high Temperature

ECCS003 LPCS pump breaker (control power fuses)

ECCS004 RHR A pump breaker (control power fuses)

Transient and Event Checklist

FACILITY: RBS

DATE OF EXAM: 09/12/2016 **OPERATING TEST NO.: NRC 301-1** Scenarios Е Α 1 2 3 (Spare) 4 М Т Ρ v Ρ Е Ο L L Ν Т Ν Т Т Α I С L Μ Α т U Υ Ν Т Ρ Wed Thurs Tues M(*) Е **CREW POSITION** CREW **CREW POSITION CREW** POSITION POSITION R L U S S S Α В Α В S Α В Α В R Т R Т R Т R 0 0 т 0 0 0 С Ρ 0 С Ρ 0 С Ρ 0 С Ρ 1 0 0 1 RX 1 1 1 0 R1 \boxtimes NOR 4 4 2 7 3,4,9 3,4, I/C 7,8 2 2 1 5,6 4 6,8 MAJ TS 2 2 0 0 1 1 0 1 3 RX 1 \boxtimes 1 1 R2 1 1 NOR 2 4 4 2 4.5 5 I/C 8,9 1 2 2 3 5,6 7 MAJ TS 0 2 2 0 1 1 0 2 1 RX \boxtimes R3 1 1 1 1 1 NOR 2 4 4 3,4, 3 5 I/C 7,8 2 1 2 5,6 7 3 MAJ TS 2 2 0 0 1 1 0 3 1 RX \boxtimes 11 1 1 1 1 1 NOR 2 4 4 1-4, 2 7 I/C 7,9 2 2 1 6,8 5,6 4 MAJ TS 0 2 2 1,5 2 Instructions:

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 SROs additionally serves in the BOP position, one I/C malfunction can be credited toward the two I/C 1. malfunctions required for the ATC position.

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 2.

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. 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. 3.

For licenses that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating controls. 4.

Transient and Event Checklist

Form ES-301-5

FACILITY: RBS

DATE OF EXAM: 09/12/2016 **OPERATING TEST NO.: NRC 301-1** Scenarios Е Α 2 1 3 (Spare) 4 Μ т Ρ ۷ Ρ Е 0 Т L Ν Т Ν I Т Α С L Μ Α т U Ν Υ т Ρ Wed Tues Thurs M(*) Е **CREW POSITION** CREW **CREW** CREW POSITION POSITION POSITION R L U S S S В Α В S Α В Α Α В R Т R т 0 R 0 R Т 0 0 Т Ρ 0 С Ρ Ο С Ρ 0 С Ο С Ρ 1 1 0 3 2 2 RX 1 1 1 2 12 \boxtimes 1 1 NOR 4 4 2 2 7 3-6 1-4. I/C 7,9 8,9 2 2 1 7 6.8 5.6 5 MAJ TS 2 2 0 4 1,5 2,6 1 1 0 1 3 RX U1 \boxtimes 1 1 1 1 1 NOR 2 1,2,7 2-4, 8 4 4 I/C 2 2 1 4 6,8 5,6 MAJ TS 2 2 0 2,4 2 1 1 0 3 1 RX U2 \boxtimes 1 1 1 1 1 NOR 2-4, 7.8 4 4 2 8 1.2.7 I/C 2 2 1 6.8 5.6 4 MAJ TS 2 2 2.4 2 0 1 1 0 RX 1 1 1 1 NOR 4 4 2 3,4, 2,3 1-4. I/C 8,9 8,9 2 2 1 <mark>6,7</mark> <mark>6,7</mark> <mark>6,7</mark> MAJ TS 2,3 2 0 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. 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 2. malfunctions on a 1-for-1 basis.

Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions 3. 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.

For licenses that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating controls. 4.