

Knowledge and Ability Record Form
 ref: NUREG - 1021 rev 8
BWR RO EXAM OUTLINE ES-401-2

COUNT MATRIX

Summarizing Counts by K/A Group
 for
 BWR - Reactor Operator

| | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | SG | Total |
|-------------------------|---|----|----|----|----|----|----|----|----|----|----|-------|
| E/APE # - T1 Gp 1 | 3 | 2 | 2 | | | | 3 | 2 | | | 1 | 13 |
| E/APE # - T1 Gp 2 | 3 | 4 | 3 | | | | 3 | 4 | | | 2 | 19 |
| E/APE # - T1 Gp 3 | 1 | 1 | 1 | | | | 1 | 0 | | | 0 | 4 |
| Tier Totals | 7 | 7 | 6 | | | | 7 | 6 | | | 3 | 36 |
| Plant Systems / T2 Gp 1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 1 | 28 |
| Plant Systems / T2 Gp 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 19 |
| Plant Systems / T2 Gp 3 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 4 |
| Tier Totals | 6 | 5 | 5 | 5 | 4 | 5 | 5 | 6 | 4 | 4 | 2 | 51 |
| Generic K/As / T3 | CAT 1 - 4 CAT 2 - 3 CAT 3 - 3 CAT 4 - 3 | | | | | | | | | | 13 | |
| Model Total | | | | | | | | | | | | 100 |

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EMERGENCY & ABNORMAL PLANT EVOLUTIONS - TIER 1 GROUP I

BWR - Reactor Operator

Target: 13%

Actual: 13%

| | E/APE # - NAME/SAFETY FUNCTION | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A TOPICS | IMP | POINTS |
|---|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|--|-----|--------|
| 1 | 295005 - Main Turbine Generator Trip - 3 | | X | | | | | | | | | | AK2.02 – Knowledge of the interrelations between MAIN TURBINE GENERATOR TRIP and the following: Feedwater Temperature | 2.9 | 1 |
| 2 | 295005 - Main Turbine Generator Trip - 3 | X | | | | | | | | | | | AK1.01 – Knowledge of the operational implications of the following concepts as they apply to MAIN TURBINE GENERATOR TRIP: Pressure effects on reactor power | 4.0 | 1 |
| 3 | 295006 - SCRAM - 1 | | | | | | | X | | | | | AA1.03 – Ability to operate and/or monitor the following as they apply to SCRAM: Reactor Turbine pressure regulating system | 3.7 | 1 |
| 4 | 295009 - Low Reactor Water Level - 2 | | X | | | | | | | | | | AK2.04 – Knowledge of the interrelations between LOW REACTOR WATER LEVEL and the following: Reactor Water Cleanup | 2.6 | 1 |
| 5 | 295009 - Low Reactor Water Level - 2 | | | | | | | | X | | | | AA2.02 – Ability to determine and/or interpret the following as they apply to LOW REACTOR WATER LEVEL: Steam flow/feedflow mismatch | 3.6 | 1 |
| 6 | 295015 - Incomplete SCRAM - 1 | X | | | | | | | | | | | AK1.03 – Knowledge of the operational implications of the following concepts as they apply to INCOMPLETE SCRAM: Reactivity effects | 3.8 | 1 |
| 7 | 295015 - Incomplete SCRAM - 1 | | | | | | | | X | | | | AA2.02 – Ability to determine and/or interpret the following as they apply to INCOMPLETE SCRAM: Control Rod Position | 4.1 | 1 |
| 8 | 295024 - High Drywell Pressure - 5 | X | | | | | | | | | | | EK1.01 – Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL PRESSURE: Drywell integrity: Plant specific | 4.1 | 1 |
| 9 | 295025 - High Reactor Pressure - 3 | | | X | | | | | | | | | EK3.02 – Knowledge of the reasons for the following responses as they apply to HIGH REACTOR PRESSURE: Recirculation pump trip: Plant Specific | 3.9 | 1 |

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| | E/APE # - NAME/SAFETY FUNCTION | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A TOPICS | IMP | POINTS |
|------------------------|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|-----|--------|
| 10 | 295031 - Reactor Low Water Level - 2 | | | | | | | X | | | | | EA1.13 – Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL: Reactor Water level control | 4.3 | 1 |
| 11 | 295031 - Reactor Low Water Level - 2 | | | | | | | | | | | X | 2.4.10 – Knowledge of annunciator response procedures | 3.0 | 1 |
| 12 | 295037 - SCRAM Condition Present and reactor power above APRM downscale or unknown - 1 | | | | | | | X | | | | | EA1.02 – Ability to operate and/or monitor the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: RRCS: Plant Specific | 3.8 | 1 |
| 13 | 500000 - High Containment Hydrogen Concentration - 5 | | | X | | | | | | | | | EK3.02 – Knowledge of the reasons for the following responses as they apply to HIGH PRIMARY CONTAINMENT HYDROGEN CONCENTRATIONS: Operation of drywell recirculation fans | 2.8 | 1 |
| Category Point Totals: | | 3 | 2 | 2 | | | | 3 | 2 | | | 1 | Group Point Totals: 13 | | 13 |

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EMERGENCY & ABNORMAL PLANT EVOLUTIONS - TIER 1 GROUP II

BWR - Reactor Operator

Target: 19%

Actual: 19%

| | E/APE # - NAME/SAFETY FUNCTION | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A TOPICS | IMP | POINTS |
|---|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|--|-----|--------|
| 1 | 295001 - Partial or Complete Loss of Forced Core Flow Circulation - 1 | | | | | | | | X | | | | AA2.04 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: Individual Jet Pump Flows | 3.0 | 1 |
| 2 | 295003 - Partial or Complete Loss of A.C. Power - 6 | | | | | | | | | | | X | 2.4.48 – Ability to interpret control room indications to verify the status and operation of system, and understand how operator actions and directives affect plant sand system conditions. | 3.5 | 1 |
| 3 | 295008 - High Reactor Water Level - 2 | | X | | | | | | | | | | AK2.09 - Knowledge of the interrelations between HIGH REACTOR WATER LEVEL and the following: Reactor Water Cleanup System | 3.1 | 1 |
| 4 | 295012 - High Drywell Temperature - 5 | X | | | | | | | | | | | AK1.02 - Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL TEMPERATURE: Reactor Power Level Control | 3.1 | 1 |
| 5 | 295012 - High Drywell Temperature - 5 | | X | | | | | | | | | | AK2.02 - Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: Drywell Cooling | 3.6 | 1 |
| 6 | 295019 - Partial or Complete Loss of Instrument Air - 8 | | | | | | | | X | | | | AA2.02 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR: Status of safety related instrument air system loads | 3.6 | 1 |
| 7 | 295022 - Loss of CRD Pumps - 1 | | | | | | | X | | | | | AA1.04 – Ability to operate and or monitor the following as they apply to LOSS OF CRD PUMPS: Reactor water cleanup system | 2.5 | 1 |
| 8 | 295026 - Suppression Pool High Water Temperature - 5 | | | | | | | | X | | | | EA2.01 - Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Suppression Pool Water temperature | 4.1 | 1 |

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| | E/APE # - NAME/SAFETY FUNCTION | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A TOPICS | IMP | POINTS |
|----|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|--|-----|--------|
| 9 | 295028 - High Drywell Temperature - 5 | X | | | | | | | | | | | EK1.02 - Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL TEMPERATURE: Equipment environmental qualification | 2.9 | 1 |
| 10 | 295028 - High Drywell Temperature - 5 | | | | | | | X | | | | | EA1.02 - Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE: Drywell Ventilation system | 3.9 | 1 |
| 11 | 295029 - High Suppression Pool Water Level - 5 | | | X | | | | | | | | | EK3.02 - Knowledge of the reasons for the following responses as they apply to HIGH SUPPRESSION POOL WATER LEVEL: Lowering Suppression Pool level | 3.6 | 1 |
| 12 | 295030 - Low Suppression Pool Water Level - 5 | X | | | | | | | | | | | EK1.01 - Knowledge of the operational implications of the following concepts as they apply to LOW SUPPRESSION POOL WATER LEVEL: Steam Condensation | 3.8 | 1 |
| 13 | 295030 - Low Suppression Pool Water Level - 5 | | X | | | | | | | | | | EK2.08 - Knowledge of the interrelations between LOW SUPPRESSION POOL WATER LEVEL and the following: SRV discharge submergence | 3.5 | 1 |
| 14 | 295033 - High Secondary Containment Area Radiation Levels - 9 | | X | | | | | | | | | | EK2.03 - Knowledge of the interrelations between HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS and the following: Secondary Containment Ventilation | 3.7 | 1 |
| 15 | 295033 - High Secondary Containment Area Radiation Levels - 9 | | | | | | | | | | | X | 2.4.1 – Knowledge of EOP entry conditions and immediate action steps | 4.3 | 1 |
| 16 | 295034 - Secondary Containment Ventilation High Radiation - 9 | | | X | | | | | | | | | EK3.01 - Knowledge of the reasons for the following responses as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION: Isolating secondary containment ventilation | 3.8 | 1 |

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| | E/APE # - NAME/SAFETY FUNCTION | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A TOPICS | IMP | POINTS |
|------------------------|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|-----|--------|
| 17 | 295038 - High Off-Site Release Rate - 9 | | | | | | | X | | | | | EA1.01 - Ability to operate and/or monitor the following as they apply to HIGH OFF-SITE RELEASE RATE: Stack gas monitoring system | 3.9 | 1 |
| 18 | 600000 - Plant Fire On Site - 8 | | | X | | | | | | | | | AK3.04 - Knowledge of the reasons for the following responses as they apply to PLANT FIRE ON SITE: Actions contained in the abnormal procedure for plnat fire on site | 2.8 | 1 |
| 19 | 600000 - Plant Fire On Site - 8 | | | | | | | | X | | | | AA2.17 - Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: Systems that may be affected by the fire | 3.1 | 1 |
| Category Point Totals: | | 3 | 4 | 3 | | | | 3 | 4 | | | 2 | Group point totals: 19 | | 19 |

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PLANT SYSTEMS - TIER 1 GROUP III

BWR - Reactor Operator

Target: 4%

Actual: 4%

| | E/APE # - NAME/SAFETY FUNCTION | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A TOPICS | IMP | POINTS | |
|------------------------|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|--|-----------------------|--------|---|
| 1 | 295021 - Loss of Shutdown Cooling - 4 | | X | | | | | | | | | | AK2.05 - Knowledge of the interrelations between LOSS OF SHUTDOWN COOLING and the following: Fuel Pool Cooling and Cleanup system | 2.7 | 1 | |
| 2 | 295032 - High Secondary Containment Area Temperature - 5 | | | X | | | | | | | | | EK3.02 - Knowledge of the reasons for the following responses as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE: Reactor SCRAM | 3.6 | 1 | |
| 3 | 295035 - Secondary Containment High Differential Pressure - 5 | | | | | | | X | | | | | EA1.01 - Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: Secondary containment ventilation system | 3.6 | 1 | |
| 4 | 295035 - Secondary Containment High Differential Pressure - 5 | X | | | | | | | | | | | EK1.01 - Knowledge of the operational implications of the following concepts as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: Secondary containment integrity. | 3.9 | 1 | |
| Category Point Totals: | | 1 | 1 | 1 | | | | 1 | 0 | | | | 4 | Group Point Totals: 4 | | 4 |

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PLANT SYSTEMS - TIER 2 GROUP I

BWR - Reactor Operator

Target: 28%

Actual: 28%

| | 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 TOPICS | IMP | POINTS |
|---|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|-----|--------|
| 1 | 201001 - Control Rod Drive Hydraulic System | | X | | | | | | | | | | K2.04 - Knowledge of electrical power supplies to the following: Scram discharge volume vent and drain valve solenoids | 3.2 | 1 |
| 2 | 201001 - Control Rod Drive Hydraulic System | | | | | | X | | | | | | K6.03 - Knowledge of the effect that a loss or malfunction of the following will have on the CONTROL ROD DRIVE HYDRAULIC System: Plant air systems | 3.0 | 1 |
| 3 | 202002 - Recirculation Flow Control System | | | | | | X | | | | | | K6.04 - Knowledge of the effect that a loss or malfunction of the following will have on the RECIRCULATION FLOW CONTROL SYSTEM: Feedwater flow inputs | 3.5 | 1 |
| 4 | 202002 - Recirculation Flow Control System | | | | | | | | | X | | | A3.02 - Ability to monitor automatic operations of the RECIRCULATION FLOW CONTROL SYSTEM including: Lights and alarms | 3.4 | 1 |
| 5 | 209002 - High Pressure Core Spray System (HPCS) | | | | | | | | | | X | | A4.14 - Ability to manually operate and/or monitor in the control room: Test Return Valve3.0 | 3.0 | 1 |
| 6 | 211000 - Standby Liquid Control System | | | X | | | | | | | | | K3.01 - Knowledge of the effect that a loss or malfunction of the STANDBY LIQUID CONTROL SYSTEM will have on following: Ability to shutdown the reactor under certain conditions. | 4.3 | 1 |
| 7 | 212000 - Reactor Protection System | | | | | X | | | | | | | K5.02 - Knowledge of the operational implications of the following concepts as they apply to REACTOR PROTECTION SYSTEM: Specific logic arrangements. | 3.3 | 1 |

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| | 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 TOPICS | IMP | POINTS |
|----|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|--|-----|--------|
| 8 | 215003 - Intermediate Range Monitor (IRM) System | | | | | | | | X | | | | A2.06 - Ability to (a) predict the impacts of the following on the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Faulty Range Switch | 3.0 | 1 |
| 9 | 215003 - Intermediate Range Monitor (IRM) System | X | | | | | | | | | | | K1.04 - Knowledge of the physical connections and/or cause- effect relationships between INTERMEDIATE RANGE MONITOR (IRM) SYSTEM and the following: Process computer/ performance monitoring system (SPDS/ERIS/CRIDS/GDS): Plant-Specific | 2.5 | 1 |
| 10 | 215004 - Source Range Monitor (SRM) System | | | | | | | | X | | | | A2.02 - Ability to (a) predict the impacts of the following on the SOURCE RANGE MONITOR (SRM) SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: SRM Inop condition. | 3.4 | 1 |
| 11 | 215004 - Source Range Monitor (SRM) System | | X | | | | | | | | | | K2.01 - Knowledge of electrical power supplies to the following: SRM channels/detectors | 2.6 | 1 |
| 12 | 215005 - Average Power Range Monitor/Local Power Range Monitor System | X | | | | | | | | | | | K1.01 - Knowledge of the physical connections and/or cause- effect relationships between APRM/LPRM and the following: RPS | 4.0 | 1 |
| 13 | 215005 - Average Power Range Monitor/Local Power Range Monitor System | | | | | X | | | | | | | K5.06 - Knowledge of the operational implications of the following concepts as they apply to APRM/LPRM: Assignment of LPRM's to specific APRM channels | 2.5 | 1 |
| 14 | 216000 - Nuclear Boiler Instrumentation | | | | | | | | | X | | | A3.01 - Ability to monitor automatic operations of the NUCLEAR BOILER Instrumentation including: Relationship between meter/recorder readings and actual parameter values: Plant-Specific | 3.4 | 1 |
| | SYSTEM #/ NAME | K | K | K | K | K | K | A | A | A | A | G | K/A TOPICS | IMP | POINTS |

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| | | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | 4 | | | | |
|----|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|--|-----|--------|
| 15 | 217000 - Reactor Core Isolation Cooling System (RCIC) | X | | | | | | | | | | | K1.08 - Knowledge of the physical connections and/or cause- effect relationships between REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) and the following: Line fill pump: Plant-Specific | 3.3 | 1 |
| 16 | 217000 - Reactor Core Isolation Cooling System (RCIC) | | | | | | | X | | | | | A1.06 - Ability to predict and/or monitor changes in parameters associated with operating the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) controls including: Condensate Storage tank level | 3.2 | 1 |
| 17 | 218000 - Automatic Depressurization System | | | | X | | | | | | | | K4.02 - Knowledge of AUTOMATIC DEPRESSURIZATION SYSTEM design feature(s) and/or interlocks which provide for the following: Allows manual initiation of ADS logic. | 3.8 | 1 |
| 18 | 218000 - Automatic Depressurization System | | | | | | | | | | | X | A4.12 - Ability to manually operate and/or monitor in the control room: Reactor vessel water level. | 4.2 | 1 |
| 19 | 223001 - Primary Containment System and Auxiliaries | | X | | | | | | | | | | K2.08 - Knowledge of electrical power supplies to the following: Containment cooling air handling units: Plant-Specific | 2.7 | 1 |
| 20 | 223001 - Primary Containment System and Auxiliaries | | | | X | | | | | | | | K4.04 - Knowledge of PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES design feature(s) and/or interlocks which provide for the following: Prevents hydrogen from reaching an explosive mixture | 3.5 | 1 |
| 21 | 239002 - Relief/Safety Valves | | | | | | X | | | | | | K6.03 - Knowledge of the effect that a loss or malfunction of the following will have on the RELIEF/SAFETY VALVES: AC power. | 2.7 | 1 |
| 22 | 239002 - Relief/Safety Valves | | | | | | | | | | | X | A4.06 - Ability to manually operate and/or monitor in the control room: Reactor Water level. | 3.9 | 1 |
| 23 | 241000 - Reactor/Turbine Pressure Regulating System | | | X | | | | | | | | | K3.03 – Knowledge of the effect that a loss or malfunction of the REACTOR/TURBINE PRESSURE REGULATING SYSTEM will have on following: Reactor Water level | 3.7 | 1 |
| | 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 TOPICS | IMP | POINTS |
| 24 | 259002 - Reactor Water | | | | | | | X | | | | | A1.03 - Ability to predict and/or monitor changes in parameters associated with operating the REACTOR WATER LEVEL | 3.8 | 1 |

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| | | | | | | | | | | | | | | | |
|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|----|
| | Level Control System | | | | | | | | | | | | CONTROL SYSTEM controls including: Reactor Power | | |
| 25 | 259002 - Reactor Water Level Control System | | | | | | | | | | | X | 2.1.8 - Ability to coordinate personnel activities outside the control room. | 3.8 | 1 |
| 26 | 261000 - Standby Gas Treatment System | | | X | | | | | | | | | K3.06 - Knowledge of the physical connections and/or cause- effect relationships between STANDBY GAS TREATMENT SYSTEM and the following: Primary containment oxygen content: Mark-I&II | 3.0 | 1 |
| 27 | 261000 - Standby Gas Treatment System | | | | | | | | | | X | | A2.06 - 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: Valve closures. | 2.9 | 1 |
| 28 | 264000 - Emergency Generators (Diesel/Jet) | | | | | X | | | | | | | K5.06 - Knowledge of the operational implications of the following concepts as they apply to EMERGENCY GENERATORS (DIESEL/JET): Load sequencing | 3.4 | 1 |
| Category Point Totals: | | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 1 | Group Point Total: 28 | | 28 |

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PLANT SYSTEMS - TIER 2 GROUP II

BWR - Reactor Operator

Target: 19%

Actual: 19%

| | 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 TOPICS | IMP | POINTS |
|---|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|--|-----|--------|
| 1 | 201004 - Rod Sequence Control System (Plant Specific) | | | | X | | | | | | | | K4.06 - knowledge of ROD SEQUENCE CONTROL SYSTEM design feature(s) and/or interlocks which provide for the following: Group notch control | 3.3 | 1 |
| 2 | 201006 - Rod Worth Minimizer System (RWM) (Plant Specific) | | | | X | | | | | | | | K4.01 - Knowledge of ROD WORTH MINIMIZER SYSTEM (RWM) design feature(s) and/or interlocks which provide for the following: Insert blocks/errors: P-Spec | 3.4 | 1 |
| 3 | 205000 - Shutdown Cooling System (RHR Shutdown Cooling Mode) | X | | | | | | | | | | | K1.14 - Knowledge of the physical connections and/or cause- effect relationships between SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) and the following: Reactor temperatures (moderator, vessel, flange) | 3.6 | 1 |
| 4 | 205000 - Shutdown Cooling System (RHR Shutdown Cooling Mode) | | | | | | X | | | | | | K6.03 - Knowledge of the effect that a loss or malfunction of the following will have on the SHUTDOWN COOLING SYSTEM/MODE: Recirculation system | 3.1 | 1 |
| 5 | 215002 - Rod Block Monitor System | | X | | | | | | | | | | K2.03 - Knowledge of electrical power supplies to the following: APRM Channels | 2.8 | 1 |
| 6 | 219000 - RHR/LPCI: Torus/Suppression Pool Cooling Mode | X | | | | | | | | | | | K1.09 - Knowledge of the physical connections and/or cause- effect relationships between RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE and the following: Nuclear boiler instrumentation | 3.3 | 1 |
| 7 | 219000 - RHR/LPCI: Torus/Suppression Pool Cooling Mode | | X | | | | | | | | | | K2.02 - Knowledge of electrical power supplies to the following: Pumps | 3.1 | 1 |
| 8 | 230000 - RHR/LPCI: Torus/Suppression Pool Spray Mode | | | | | | | X | | | | | A1.06 - Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: TORUS/SUPPRESSION POOL SPRAY MODE controls including: Suppression pool level | 3.3 | 1 |

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| | SYSTEM #/ NAME | K | K | K | K | K | K | A | A | A | A | G | K/A TOPICS | IMP | POINTS |
|----|---|---|---|---|---|---|---|---|---|---|---|---|--|-----|--------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | 4 | | | | |
| 9 | 239001 - Main and Reheat Steam System | | | | | | | | X | | | | A2.09 - Ability to (a) predict the impacts of the following on the MAIN AND REHEAT STEAM SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Opening of head vent to drywell equipment sump with pressure in the reactor vessel | 3.4 | 1 |
| 10 | 245000 - Main Turbine Generator and Auxiliary Systems | | | X | | | | | | | | | K3.02 - Knowledge of the effect that a loss or malfunction of the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS will have on following: Reactor pressure | 3.9 | 1 |
| 11 | 262001 - A.C. Electrical Distribution | | | | | X | | | | | | | K5.01 - Knowledge of the operational implications of the following concepts as they apply to A.C. ELECTRICAL DISTRIBUTION: Principle involved with paralleling two A.C. sources | 3.1 | 1 |
| 12 | 262001 - A.C. Electrical Distribution | | | | | | | X | | | | | A1.04 - Ability to predict and/or monitor changes in parameters associated with operating the A.C. ELECTRICAL DISTRIBUTION controls including: Load currents | 2.7 | 1 |
| 13 | 262002 - Uninterruptable Power Supply (A.C./D.C.) | | | | | | | | | | X | | A4.01 - Ability to manually operate and/or monitor in the control room: Transfer from alternative source to preferred source | 2.8 | 1 |
| 14 | 286000 - Fire Protection System | | | X | | | | | | | | | K3.01 - Knowledge of the effect that a loss or malfunction of the FIRE PROTECTION SYSTEM will have on following: The ability to detect fires | 3.2 | 1 |
| 15 | 290001 - Secondary Containment | | | | | | | | X | | | | A2.05 - Ability to (a) predict the impacts of the following on the SECONDARY CONTAINMENT; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High area temperature | 3.1 | 1 |
| 16 | 290001 - Secondary Containment | | | | | | | | | | | X | 2.1.16 - Ability to operate plant phone, paging system, and two-way radio. | 2.9 | 1 |

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 ref: NUREG - 1021 rev 8
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| | 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 TOPICS | IMP | POINTS |
|------------------------|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|-----|--------|
| 17 | 290003 - Control Room HVAC | | | | | | | | | X | | | A3.01 - Ability to monitor automatic operations of the CONTROL ROOM HVAC including: Initiation/reconfiguration. | 3.3 | 1 |
| 18 | 300000 - Instrument Air System (IAS) | | | | | | X | | | | | | K6.12 - Knowledge of the effect that a loss or malfunction of the following will have on the INSTRUMENT AIR SYSTEM: Breakers, relays, and disconnects. | 2.9 | 1 |
| 19 | 400000 - Component Cooling Water System (CCWS) | | | | | | | | | X | | | A3.01 - Ability to monitor automatic operations of the CCWS including: Setpoints on instrument signal levels for normal operations, warnings, and trips that are applicable to the CCWS | 3.0 | 1 |
| Category Point Totals: | | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | Group point totals: 19 | | 19 |

Knowledge and Ability Record Form
 ref: NUREG - 1021 rev 8
BWR RO EXAM OUTLINE ES-401-2

PLANT SYSTEMS - TIER 2 GROUP III

BWR - Reactor Operator

Target: 4%

Actual: 4%

| | 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 TOPICS | IMP | POINTS |
|---|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|-----|--------|
| 1 | 215001 - Traversing In-Core Probe | | | | X | | | | | | | | K4.01 - Knowledge of TRAVERSING IN-CORE PROBE design feature(s) and/or interlocks which provide for the following: Primary containment isolation: Mark-I&II(Not-BWR1) | 3.4 | 1 |
| 2 | 268000 – Radwaste | | | | | | | X | | | | | A1.02 - Ability to predict and/or monitor changes in parameters associated with operating the RADWASTE controls including: Offsite release | 2.6 | 1 |
| 3 | 288000 - Plant Ventilation Systems | X | | | | | | | | | | | K1.03 - Knowledge of the physical connections and/or cause- effect relationships between PLANT VENTILATION SYSTEMS and the following: Standby gas treatment | 3.7 | 1 |
| 4 | 288000 - Plant Ventilation Systems | | | | | | | | X | | | | A2.03 - Ability to (a) predict the impacts of the following on the PLANT VENTILATION SYSTEMS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of coolant accident: Plant specific | 3.5 | 1 |
| | Category Point Totals: | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | Group point totals: 4 | | 4 |

Knowledge and Ability Record Form
 ref: NUREG - 1021 rev 8
BWR RO EXAM OUTLINE ES-401-2

PLANT-WIDE GENERIC RESPONSIBILITIES TIER 3

BWR - Reactor Operator

Target: 13%

Actual: 13%

| | Category | K/A | TOPICS | IMP | POINTS |
|----|-----------------------------|--------|---|-----|--------|
| 1 | Conduct of Operations | 2.1.25 | Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data. | 2.8 | 1 |
| 2 | | 2.1.17 | Ability to make accurate, clear and concise verbal reports. | 3.5 | 1 |
| 3 | | 2.1.14 | Knowledge of system status criteria which require the notification of plant personnel. | 2.5 | 1 |
| 4 | | 2.1.1 | Knowledge of conduct of operations requirements. | 3.7 | 1 |
| 5 | Equipment | 2.2.30 | Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area / communication with fuel storage facility / systems operated from the control room in support of fueling operations / and supporting instrumentation. | 3.5 | 1 |
| 6 | Control | 2.2.13 | Knowledge of tagging and clearance procedures. | 3.6 | 1 |
| 7 | | 2.2.22 | Knowledge of limiting conditions for operations and safety limits. | 3.4 | 1 |
| 8 | Radiation | 2.3.11 | Ability to control radiation releases | 2.7 | 1 |
| 9 | Control | 2.3.4 | Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. | 2.5 | 1 |
| 10 | | 2.3.1 | Knowledge of 10 CFR 20 and related facility radiation control requirements. | 2.6 | 1 |
| 11 | Emergency Proc. | 2.4.18 | Knowledge of the specific bases for EOPs. | 2.7 | 1 |
| 12 | Plan | 2.4.4 | Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. | 4.0 | 1 |
| 13 | | 2.4.24 | Knowledge of loss of cooling water procedures. | 3.3 | 1 |
| | | | Group point totals: 13 | | 13 |