

FACILITY NAME: Crystal River 3

Section 1

REPORT NUMBER: 05000302/2009-301

DRAFT ADMINISTRATIVE DOCUMENTS

CONTENTS:

- ☒ Draft Written Exam sample plan (ES-401-1/2)
- ☒ Draft Administrative Topics Outline (ES-301-1)
- ☒ Draft Control Room Systems & Facility Walk-Through Test Outline (ES-301-2)

Location of Electronic Files:

Submitted By: Gerard M. Lark

Verified By: 13/12

DRAFT

| Facility: | | Crystal River Unit #3 | | | | | | | | | | Date of Exam: | | September, 2009 | | | | | |
|---|----------------|------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|-----------------|-----------------|----|-------|---|---|---|
| Tier | Group | RO K/A Category Points | | | | | | | | | | | SRO-Only Points | | | | | | |
| | | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G * | TOTAL | A2 | G* | TOTAL | | | |
| 1. Emergency & Abnormal Plant Evolutions | 1 | 3 | 2 | 4 | N/A | | | 3 | 3 | N/A | | 3 | 18 | | | 6 | | | |
| | 2 | 2 | 1 | 1 | | | | 1 | 2 | | | 2 | 9 | | | 4 | | | |
| | Tier Totals | 5 | 3 | 5 | | | | 4 | 5 | | | 5 | 27 | | | 10 | | | |
| 2. Plant Systems | 1 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 28 | | | 5 | | | |
| | 2 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 10 | | | 3 | | | |
| | Tier Totals | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 4 | 2 | 3 | 4 | 38 | | | 8 | | | |
| 3. Generic Knowledge and Abilities Categories | | | | | 1 | | 2 | | 3 | | 4 | | 10 | | 1 | 2 | 3 | 4 | 7 |
| | | | | | 3 | | 2 | | 3 | | 2 | | | | | | | | |
| <p>Note: 1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).</p> <p>2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ± 1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.</p> <p>3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.</p> <p>4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.</p> <p>5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.</p> <p>6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.</p> <p>7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to section d.1.b of ES-401 for the applicable K/As.</p> <p>8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2. (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.</p> <p>9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.</p> | | | | | | | | | | | | | | | | | | | |

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| ES-401 | | PWR Examination Outline | | | | | | Form ES-401-2 | |
|--|-----|-------------------------|-----|-----|-----|---|---|---------------|---|
| Emergency and Abnormal Plant Evolutions – Tier 1 / Group 1 | | | | | | | | | |
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
| 007 (BW/E02 & E10) Reactor Trip – Stabilization – Recovery – 1 (changed from 007EA2.05) | | | | | X | | 007EA2.02 - Ability to determine or interpret the following as they apply to a reactor trip: Proper actions to be taken if the automatic safety functions have not taken place | 4.3 | 1 |
| 008 Pressurizer Vapor Space Accident / 3 | | | | | | X | 008AG2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation. | 4.3 | 1 |
| 009 Small Break LOCA / 3 | | X | | | | | 009EK2.03 - Knowledge of the interrelations between the small break LOCA and the S/Gs. | 3.0 | 1 |
| 011 Large Break LOCA / 3 (changed from 011EK3.04) | | | X | | | | 011EK3.07 – Knowledge of the reasons for the following responses as they apply to the Large Break LOCA: Stopping HPI bypass flow (recirc flow OK per GL) | 3.5 | 1 |
| 015/17 RCP Malfunctions /4 | X | | | | | | 015/017AK1.05 – Knowledge of the operational implications of the following concepts as they apply to RCP malfunction (Loss of RC Flow): Effects of unbalanced RCS flow on in-core average temperature, core imbalance, and quadrant power tilt. | 2.7 | 1 |
| 022 Loss of Rx Coolant Makeup / 2 (changed from 022AK1.02) | X | | | | | | 022AK1.03 - Knowledge of the operational implications of the following concepts as they apply to Loss of Reactor Coolant Makeup: Relationship between makeup flow and PZR level | 3.0 | 1 |
| 025 Loss of RHR System / 4 | | | | | X | | 025AA2.01 - Ability to determine and interpret the following as they apply to the Loss of Decay Heat Removal System: Proper amperage of running LPI/decay heat removal/RHR pump(s) | 2.7 | 1 |

ES-401

PWR Examination Outline

Form ES-401-2

Emergency and Abnormal Plant Evolutions – Tier 1 / Group 1

| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
|---|--------|--------|--------|--------|--------|---|---|-----|---|
| 026 Loss of Component Cooling Water / 8 | | | X | | | | 026AK3.02 - Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Services / Decay Heat Closed Cycle Cooling: The automatic actions (alignments) within the SWS / DCS resulting from the actuation of the ESFAS | 3.6 | 1 |
| 027 PZR Pressure Control System Malfunction / 3 | | | X | | | | 027AK3.04 - Knowledge of the reasons for the following responses as they apply to the PZR Pressure Control Malfunctions: Why, if PZR level is lost and then restored, that pressure recovers much more slowly. | 2.8 | 1 |
| 029 ATWS / 1 | | | | X | | | 029EA1.12 - Ability to operate and monitor the following as they apply to an ATWS: Reactor trip breakers | 4.1 | 1 |
| 038 Steam Generator Tube Rupture / 3 | | | | | | X | 038EG2.1.28 - Knowledge of the purpose and function of major system components and controls. | 4.1 | 1 |
| 040 (BW/E05) Steam Line Rupture – Excessive Heat Transfer / 4 | | | | | | | | | |
| 054 Loss of Main Feedwater / 4 | | | | X | | | 054AA1.01 - Ability to operate and / or monitor the following as they apply to the Loss of Main Feedwater (MFW): EFW controls, including the use of alternate EFW sources | 4.5 | 1 |
| 055 Station Blackout / 6 (changed from 055EK2.04) | | | X | | | | 055EK3.02 - Knowledge of the reasons for the following responses as they apply to the Station Blackout: Actions contained in EOP for loss of offsite and onsite power. | 4.3 | 1 |
| 056 Loss of Offsite Power / 6 (changed from 56AA1.28) | | | | X | | | 056AA1.05 - Ability to operate and / or monitor the following as they apply to the Loss of Offsite Power: Initiation (manual) of safety injection process | 3.8 | 1 |

| ES-401 | | PWR Examination Outline | | | | | | Form ES-401-2 | |
|---|-----|-------------------------|-----|-----|-----|---|---|---------------|---|
| Emergency and Abnormal Plant Evolutions – Tier 1 / Group 1 | | | | | | | | | |
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
| 057 Loss of Vital AC Instrument Bus / 6 | | | | | | | | | |
| 058 Loss of DC Power / 6 | X | | | | | | 058AK1.01 - Knowledge of the operational implications of the following concepts as they apply to Loss of DC Power: Battery charger equipment and instrumentation | 2.8 | 1 |
| 062 Loss of Nuclear Services Water / 4 | | | | | | | | | |
| 065 Loss of Instrument Air / 8 | | | | | | X | 065AG2.4.8 - Knowledge of how abnormal operating procedures are used in conjunction with EOPs. | 3.8 | 1 |
| BW/E04 Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4 | | | | | X | | BW/E04EA2.1 - Ability to determine and interpret the following as they apply to the (Inadequate Heat Transfer): Facility conditions and selection of appropriate procedures during abnormal and emergency operations. | 3.2 | 1 |
| 077 Generator Voltage and Electric Grid Disturbances / 6 | | X | | | | | 077AK2.03 – Knowledge of the interrelations between Generator Voltage and Electric Grid disturbances and the following: Sensors, detectors, indicators. | 3.0 | 1 |
| | | | | | | | | | |
| K/A Category Totals | 3 | 2 | 4 | 3 | 3 | 3 | Group Point Total | 18/6 | |

| ES-401 | | PWR Examination Outline | | | | | | Form ES-401-2 | |
|--|--------|-------------------------|--------|--------|--------|---|--|---------------|---|
| Emergency and Abnormal Plant Evolutions – Tier 1 / Group 2 | | | | | | | | | |
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
| 001 Continuous Rod Withdrawal / 1 (changed from 001AA2.02) | | | | | X | | 001AA2.05 - Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal: Uncontrolled rod withdrawal from available indications | 4.4 | 1 |
| 003 Dropped Control Rod / 1 | X | | | | | | 003AK1.10 - Knowledge of the operational implications of the following concepts as they apply to Dropped Control Rod: Definitions of core quadrant power tilt | 2.6 | 1 |
| 005 Inoperable/Stuck Rod / 1 | | | X | | | | 005AK3.05 - Knowledge of the reasons for the following responses as they apply to the Inoperable / Stuck Control Rod: Power limits on rod misalignment | 3.4 | 1 |
| 024 Emergency Boration / 1 | | | | | | | | | |
| 028 PZR Level Malfunction / 2 | | | | | | | | | |
| 032 Loss of Source Range NI / 7 | | | | | | | | | |
| 033 Loss of Intermediate Range NI / 7 | | | | | | | | | |
| 036 (BW/A08) Fuel Handling Accident / 8 | | | | | | | | | |
| 037 Steam Generator Tube Leak / 3 | | | | | | | | | |
| 051 Loss of Condenser Vacuum / 4 | | | | | | | | | |
| 059 Accidental Liquid RadWaste Rel. / 9 | | | | | | | | | |
| 060 Accidental Gaseous Radwaste Rel. / 9 | | | | | | | | | |

| ES-401 | | PWR Examination Outline | | | | | | Form ES-401-2 | |
|--|-----|-------------------------|-----|-----|-----|---|---|---------------|---|
| Emergency and Abnormal Plant Evolutions – Tier 1 / Group 2 | | | | | | | | | |
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
| 061 ARM System Alarms / 7 | | | | | | X | 061AG2.2.12 - Knowledge of surveillance procedures. | 3.7 | 1 |
| 067 Plant Fire On-site / 8 | | | | | | | | | |
| 068 (BW/A06) Control Room Evac. / 8 | X | | | | | | BW/A06AK1.3 - Knowledge of the operational implications of the following concepts as they apply to the (Shutdown Outside Control Room): Annunciators and conditions indicating signals, and remedial actions associated with the (Shutdown Outside Control Room). | 3.4 | 1 |
| 069 Loss of CTMT Integrity / 5 | | | | | | | | | |
| 074 Inad. Core Cooling / 4 | | | | | X | | 074EA2.03 - Ability to determine or interpret the following as they apply to a Inadequate Core Cooling: Availability of turbine bypass valves for cooldown | 3.8 | 1 |
| 076 High Reactor Coolant Activity / 9 | | | | | | | | | |
| BW/A01 Plant Runback / 1 | | | | | | | | | |
| BW/A02&A03 Loss of NNI-X/Y / 7 | | | | | | X | BW/A02AG2.2.12 - Knowledge of surveillance procedures. (Loss of NNI-X while performing an SP OK per GL) | 3.7 | 1 |
| BW/A04 Turbine Trip / 4 | | | | | | | | | |
| BW/A05 Emergency Diesel Actuation / 6 | | | | | | | | | |
| BW/A07 Flooding / 8 | | X | | | | | BW/A07AK2.1 - Knowledge of the interrelations between the (Flooding) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. | 3.7 | 1 |

ES-401

PWR Examination Outline

Form ES-401-2

Emergency and Abnormal Plant Evolutions – Tier 1 / Group 2

| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
|--|--------|--------|--------|--------|--------|---|--|-----|-----|
| BW/E03 Inadequate Subcooling Margin / 4 | | | | | | | | | |
| BW/E08 LOCA Cooldown - Depress. / 4 | | | | X | | | BW/E08EA1.1 - Ability to operate and / or monitor the following as they apply to the (LOCA Cooldown): Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. | 4.0 | 1 |
| BW/E09 Natural Circ. / 4 | | | | | | | | | |
| BW/E13&E14 EOP Rules and Enclosures | | | | | | | | | |
| | | | | | | | | | |
| K/A Category Totals | 2 | 1 | 1 | 1 | 2 | 2 | Group Point Total | | 9/4 |

| ES-401 | | PWR Examination Outline Plant Systems – Tier 2 / Group 1 | | | | | | | | | | Form ES-401-2 | | |
|---|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|---|---|-----|---|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 003 Reactor Coolant Pump / 4 | | | | | | X | | | | | | 003K6.14 - Knowledge of the effect of a loss or malfunction on the following will have on the RCPs: Starting Requirements | 2.6 | 1 |
| 004 Chemical and Volume Control / 1 & 2 | | X | | | | | | | | | | 004K2.06 - Knowledge of bus power supplies to the CVCS control instrumentation. | 2.6 | 1 |
| 005 Residual Heat Removal / 4 | | X | | | | | | | | | | 005K2.01 - Knowledge of bus power supplies to the DH pumps. | 3.0 | 1 |
| | | | | | | X | | | | | | 005K6.03 - Knowledge of the effect of a loss or malfunction on the following will have on the Decay Heat System: DH heat exchanger | 2.5 | 1 |
| 006 Emergency Core Cooling / 2 & 3 (changed from 006K5.01) | | | | | X | | | | | | | 006K5.04 - Knowledge of the operational implications of the following concepts as they apply to ECCS: Brittle fracture, including causes and preventative actions | 2.9 | 1 |
| | | | | | | | | X | | | | 006A2.10 - Ability to (a) predict the impacts of a low boron concentration in the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of this malfunction. | 3.4 | 1 |
| 007 PZR Relief/Quench Tank / 5 | | | | | | | | | | X | | 007A4.09 - Ability to manually operate and/or monitor in the control room: relationships between PZR level and changing levels of the PRT and bleed holdup tank | 2.5 | 1 |
| 008 Component Cooling Water / 8 | | | | X | | | | | | | | 008K4.02 - Knowledge of SWS / DCS design feature(s) and/or interlock(s) which provide for operation of the surge tank, including the associated valves and controls. | 2.9 | 1 |

| ES-401 | | PWR Examination Outline Plant Systems – Tier 2 / Group 1 | | | | | | | | | | Form ES-401-2 | | |
|--|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|---|---|-----|---|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 008 Component Cooling Water / 8 | | | | | | | X | | | | | 008A1.03 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SWS / DCS controls including: CCW pressure. | 2.7 | 1 |
| 010 Pressurizer Pressure Control / 3 | | | | | X | | | | | | | 010K5.01 - Knowledge of the operational implications of the following concepts as they apply to the PZR PCS: Determination of condition of fluid in PZR, using steam tables | 3.5 | 1 |
| 012 Reactor Protection / 7 | | | | | | | | | | | X | 012G2.4.6 – Knowledge of EOP mitigation strategies. | 3.7 | 1 |
| | | | | | X | | | | | | | 012K5.01 - Knowledge of the operational implications of the following concepts as they apply to the RPS: DNB | 3.3 | 1 |
| 013 Engineered Safety Features Actuation / 2 | | X | | | | | | | | | | 013K2.01 - Knowledge of bus power supplies to the ESFAS / safeguards equipment control. | 3.6 | 1 |
| 022 Containment Cooling / 5 | | | | X | | | | | | | | 022K4.01 - Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following: Cooling of reactor building penetrations. | 2.5 | 1 |
| 026 Containment Spray / 5 | | | | | | | X | | | | | 026A1.01 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the BSS controls including: Reactor Building pressure | 3.9 | 1 |
| 039 Main and Reheat Steam / 4 | | | X | | | | | | | | | 039K3.05 - Knowledge of the effect that a loss or malfunction of the MRSS will have on the following: RCS | 3.6 | 1 |

| ES-401 | | PWR Examination Outline Plant Systems – Tier 2 / Group 1 | | | | | | | | | | Form ES-401-2 | | |
|--|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|---|---|-----|---|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 059 Main Feedwater / 4 | | | | | | | | | X | | | 059A3.04 - Ability to monitor automatic operation of the MFW, including: Turbine driven feed pump | 2.5 | 1 |
| | | | X | | | | | | | | | 059K3.02 - Knowledge of the effect that a loss or malfunction of the MFW will have on the following: EFW system | 3.6 | 1 |
| 061 Auxiliary / Emergency Feedwater / 4 | | | X | | | | | | | | | 061K3.02 - Knowledge of the effect that a loss or malfunction of the EFW will have on the following: S/G | 4.2 | 1 |
| 062 AC Electrical Distribution / 6 | | | | | | | | X | | | | 062A2.16 - Ability to (a) predict the impacts of the following malfunctions or operations on the AC distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Degraded system voltages | 2.5 | 1 |
| 063 DC Electrical Distribution / 6 | | | | | | | | | X | | | 063A3.01 - Ability to monitor automatic operation of the dc electrical system, including: Meters, annunciators, dials, recorders, and indicating lights | 2.7 | 1 |
| 064 Emergency Diesel Generator / 6 | | | | | | | | | | X | | 064G2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm. | 4.1 | 1 |
| | | | | X | | | | | | | | 064K4.01 - Knowledge of ED/G system design feature(s) and/or interlock(s) which provide for the following: Trips while loading the ED/G (frequency, voltage, speed) | 3.8 | 1 |
| 073 Process Radiation Monitoring / 7 | | | | | | | | | | X | | 073A4.03 - Ability to manually operate and/or monitor in the control room: Check source for operability demonstration | 3.1 | 1 |

| ES-401 | | PWR Examination Outline Plant Systems – Tier 2 / Group 1 | | | | | | | | | | Form ES-401-2 | | |
|---|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|---|--|-----|------|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 076 Service Water / 4 | | | | | | | | | | | X | 076G2.4.8 - Knowledge of how abnormal operating procedures are used in conjunction with EOPs. | 3.8 | 1 |
| 078 Instrument Air / 8 | X | | | | | | | | | | | 078K1.04 - Knowledge of the physical connections and/or cause-effect relationships between the IAS and the following systems: Cooling water to compressor | 2.6 | 1 |
| 103 Containment / 5 (changed from 103A2.05) | | | | | | | | X | | | | 103A2.03 - Ability to (a) predict the impacts of the following malfunctions or operations on the reactor building system and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Phase A and B isolation | 3.5 | 1 |
| | X | | | | | | | | | | | 103K1.01 - Knowledge of the physical connections and/or cause-effect relationships between the reactor building system and the following systems: CCS | 3.6 | 1 |
| | | | | | | | | | | | | | | |
| K/A Category Totals | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | Group Point Total | | 28/5 |

| ES-401 | | PWR Examination Outline Plant Systems – Tier 2 / Group 2 | | | | | | | | | | Form ES-401-2 | | |
|---|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|---|--|-----|---|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 001 Control Rod Drive / 1 | | | | | | | | | | | | | | |
| 002 Reactor Coolant / 2 & 4 | | | | | | | | | | | | | | |
| 011 Pressurizer Level Control / 2 | | | | | | | | | | | | | | |
| 014 Rod Position Indication / 1 | | | | | | | | | | | | | | |
| 015 Nuclear Instrumentation / 7 | | | X | | | | | | | | | 015K3.01 - Knowledge of the effect that a loss or malfunction of the NIS will have on the following: RPS | 3.9 | 1 |
| 016 Non-nuclear Instrumentation / 7 | | | | | | | | | | X | | 016A4.02 - Ability to manually operate and/or monitor in the control room: Recorders | 2.7 | 1 |
| 017 In-core Temperature Monitor / 7 | | | | | X | | | | | | | 017K5.02 - Knowledge of the operational implications of the following concepts as they apply to the ITM system: Saturation and subcooling of water | 3.7 | 1 |
| 027 Containment Iodine Removal / 5 | X | | | | | | | | | | | 027K1.01 - Knowledge of the physical connections and/or cause- effect relationships between the CIRS and the following systems: CSS | 3.4 | 1 |
| 028 Hydrogen Recombiner and Purge Control / 5 (changed from 028A2.03) | | | | | | | | X | | | | 028A2.02 - Ability to (a) predict the impacts of the following malfunctions or operations on the HRPS; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: LOCA condition and related concern over hydrogen | 3.5 | 1 |
| 029 Containment Purge / 8 | | | | | | | | | | | | | | |

| ES-401 | | PWR Examination Outline Plant Systems – Tier 2 / Group 2 | | | | | | | | | | Form ES-401-2 | | |
|---|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|---|---|-----|---|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 033 Spent Fuel Pool Cooling / 8 | | | | | | | X | | | | | 033A1.01 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating Spent Fuel Pool Cooling System controls including: Spent fuel pool water level. | 2.7 | 1 |
| 034 Fuel Handling Equipment / 8 | | | | | | | | | | | X | 034G2.2.40 – Ability to apply Technical Specifications for a system. | 3.4 | 1 |
| 035 Steam Generator / 4 | | | | | | | | | | | | | | |
| 041 Steam Dump/Turbine Bypass Control / 4 | | | | | | X | | | | | | 041K6.03 - Knowledge of the effect of a loss or malfunction on the following will have on the Turbine Bypass Valves: Controller and positioners, including ICS, S/G, CRDS | 2.7 | 1 |
| 045 Main Turbine Generator / 4 | | | | | | | | | | | | | | |
| 055 Condenser Air Removal / 4 | | | | | | | | | | | | | | |
| 056 Condensate / 4 | X | | | | | | | | | | | 056K1.03 - Knowledge of the physical connections and/or cause-effect relationships between the Condensate System and the following systems: MFW | 2.6 | 1 |
| 068 Liquid Radwaste / 9 | | | | X | | | | | | | | 068K4.01 - Knowledge of design feature(s) and/or interlock(s) which provide for the following: Safety and environmental precautions for handling hot, acidic, and radioactive liquids | 3.4 | 1 |
| 071 Waste Gas Disposal / 9 | | | | | | | | | | | | | | |
| 072 Area Radiation Monitoring / 7 | | | | | | | | | | | | | | |
| 075 Circulating Water / 8 | | | | | | | | | | | | | | |

| ES-401 | | PWR Examination Outline Plant Systems – Tier 2 / Group 2 | | | | | | | | | | Form ES-401-2 | | |
|-------------------------|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|---|-------------------|----|------|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 079 Station Air / 8 | | | | | | | | | | | | | | |
| 086 Fire Protection / 8 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| K/A Category Totals | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | Group Point Total | | 10/3 |

RO

| Facility: | | Crystal River Unit #3 | Date of Exam: | | September, 2009 | |
|---|----------|---|---------------|----|-----------------|---|
| Category | K/A # | Topic | RO | | SRO-Only | |
| | | | IR | # | IR | # |
| 1. Conduct of Operations | 2.1.3 | Knowledge of shift or short-term relief turnover practices. | 3.7 | 1 | | |
| | 2.1.36 | Knowledge of procedures and limitations involved in core alterations. (changed from 2.1.35) | 3.0 | 1 | | |
| | 2.1.40 | Knowledge of refueling administrative requirements. | 2.8 | 1 | | |
| | | | | | | |
| | Subtotal | | | 3 | | |
| 2. Equipment Control | 2.2.20 | Knowledge of the process for managing troubleshooting activities. | 2.6 | 1 | | |
| | 2.2.38 | Knowledge of conditions and limitations in the facility license. | 3.6 | 1 | | |
| | | | | | | |
| | Subtotal | | | 2 | | |
| 3. Radiation Control | 2.3.11 | Ability to control radiation releases. | 3.8 | 1 | | |
| | 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 | 1 | | |
| | 2.3.14 | Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. | 3.4 | 1 | | |
| | | | | | | |
| | Subtotal | | | 3 | | |
| 4. Emergency Procedures / Plan | 2.4.8 | Knowledge of how abnormal operating procedures are used in conjunction with EOPs. | 3.8 | 1 | | |
| | 2.4.35 | Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects. | 3.8 | 1 | | |
| | | | | | | |
| | Subtotal | | | 2 | | |
| Tier 3 Point Total | | | | 10 | | 7 |

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

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| ES-401 | | PWR Examination Outline | | | | | | Form ES-401-2 | |
|--|--------|-------------------------|--------|--------|--------|---|--|---------------|---|
| Emergency and Abnormal Plant Evolutions – Tier 1 / Group 1 | | | | | | | | | |
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
| 007 (BW/E02 & E10) Reactor Trip – Stabilization – Recovery - 1 | | | | | | | | | |
| 008 Pressurizer Vapor Space Accident / 3 | | | | | | | | | |
| 009 Small Break LOCA / 3 | | | | | | | | | |
| 011 Large Break LOCA / 3 | | | | | | | | | |
| 015/17 RCP Malfunctions /4 | | | | | | | | | |
| 022 Loss of Rx Coolant Makeup / 2 | | | | | X | | 022AA2.01 - Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Pump Makeup: Whether makeup line leak exists | 3.8 | 1 |
| 025 Loss of RHR System / 4 | | | | | | | | | |
| 026 Loss of Component Cooling Water / 8 | | | | | | | | | |
| 027 PZR Pressure Control System Malfunction / 3 | | | | | | X | 027AG2.4.9 - Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of DH) mitigation strategies. | 4.2 | 1 |
| 029 ATWS / 1 | | | | | | | | | |
| 038 Steam Generator Tube Rupture / 3 | | | | | | | | | |
| 040 (BW/E05) Steam Line Rupture – Excessive Heat Transfer / 4 | | | | | | | | | |
| 054 Loss of Main Feedwater / 4 | | | | | | | | | |
| 055 Station Blackout / 6 | | | | | | | | | |

| ES-401 | | PWR Examination Outline | | | | | | Form ES-401-2 | |
|---|--------|-------------------------|--------|--------|--------|---|---|---------------|------|
| Emergency and Abnormal Plant Evolutions – Tier 1 / Group 1 | | | | | | | | | |
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
| 056 Loss of Offsite Power / 6 | | | | | | X | 056AG2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm. | 4.3 | 1 |
| 057 Loss of Vital AC Instrument Bus / 6 | | | | | X | | 057AA2.05 - Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: S/G pressure and level meters | 3.8 | 1 |
| 058 Loss of DC Power / 6 | | | | | | | | | |
| 062 Loss of Nuclear Services Water / 4 | | | | | | | | | |
| 065 Loss of Instrument Air / 8 | | | | | X | | 065AA2.04 - Ability to determine and interpret the following as they apply to the Loss of Instrument Air: Typical conditions which could cause a compressor trip (e.g., high temperature) | 2.7 | 1 |
| BW/E04 Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4 | | | | | | | | | |
| 077 Generator Voltage and Electric Grid Disturbances / 6 | | | | | | X | 077AG2.2.12 - Knowledge of surveillance procedures. | 4.1 | 1 |
| | | | | | | | | | |
| K/A Category Totals | | | | | 3 | 3 | Group Point Total | | 18/6 |

ES-401

PWR Examination Outline

Form ES-401-2

Emergency and Abnormal Plant Evolutions – Tier 1 / Group 2

| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
|---|--------|--------|--------|--------|--------|---|--|-----|---|
| 001 Continuous Rod Withdrawal / 1 | | | | | | | | | |
| 003 Dropped Control Rod / 1 | | | | | | | | | |
| 005 Inoperable/Stuck Rod / 1 | | | | | | | | | |
| 024 Emergency Boration / 1 | | | | | | | | | |
| 028 PZR Level Malfunction / 2 | | | | | | | | | |
| 032 Loss of Source Range NI / 7 | | | | | | | | | |
| 033 Loss of Intermediate Range NI / 7 | | | | | | | | | |
| 036 (BW/A08) Fuel Handling Accident / 8 | | | | | | | | | |
| 037 Steam Generator Tube Leak / 3 | | | | | | | | | |
| 051 Loss of Condenser Vacuum / 4 | | | | | | | | | |
| 059 Accidental Liquid RadWaste Rel. / 9 | | | | | | | | | |
| 060 Accidental Gaseous Radwaste Rel. / 9 | | | | | | | | | |
| 061 ARM System Alarms / 7 (changed from 061AA2.02) | | | | | X | | 061AA2.06 - Ability to determine and interpret the following as they apply to the Area Radiation Monitoring (ARM) System Alarms: Required actions if alarm channel is out of service | 4.1 | 1 |
| 067 Plant Fire On-site / 8 | | | | | | | | | |

| ES-401 | | PWR Examination Outline | | | | | | Form ES-401-2 | |
|--|-----|-------------------------|-----|-----|-----|---|--|---------------|-----|
| Emergency and Abnormal Plant Evolutions – Tier 1 / Group 2 | | | | | | | | | |
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
| 068 (BW/A06) Control Room Evac. / 8 | | | | | | | | | |
| 069 Loss of CTMT Integrity / 5 | | | | | | X | 069AG2.2.38 – Knowledge of conditions and limitations in the facility license. | 4.5 | 1 |
| 074 Inad. Core Cooling / 4 | | | | | | | | | |
| 076 High Reactor Coolant Activity / 9 | | | | | | | | | |
| BW/A01 Plant Runback / 1 | | | | | | | | | |
| BW/A02&A03 Loss of NNI-X/Y / 7 | | | | | | X | BW/A03AG2.4.6 - Knowledge of EOP mitigation strategies. | 4.7 | 1 |
| BW/A04 Turbine Trip / 4 | | | | | | | | | |
| BW/A05 Emergency Diesel Actuation / 6 | | | | | | | | | |
| BW/A07 Flooding / 8 | | | | | | | | | |
| BW/E03 Inadequate Subcooling Margin / 4 | | | | | | | | | |
| BW/E08 LOCA Cooldown - Depress. / 4 | | | | | | | | | |
| BW/E09 Natural Circ. / 4 | | | | | X | | BW/E09EA2.2 - Ability to determine and interpret the following as they apply to the (Natural Circulation Cooldown): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments. | 4.0 | 1 |
| K/A Category Totals | | | | | 2 | 2 | Group Point Total | | 9/4 |

| ES-401 | | PWR Examination Outline Plant Systems – Tier 2 / Group 1 | | | | | | | | | | Form ES-401-2 | | |
|--|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|---|--|-----|---|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 003 Reactor Coolant Pump / 4 | | | | | | | | | | | | | | |
| 004 Chemical and Volume Control / 1 & 2 | | | | | | | | | | | | | | |
| 005 Residual Heat Removal / 4 | | | | | | | | X | | | | 005A2.01 - Ability to (a) predict the impacts of the following malfunctions or operations on the Decay Heat System, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure modes for pressure, flow, pump motor amps, motor temperature, and tank level instrumentation | 2.9 | 1 |
| 006 Emergency Core Cooling / 2 & 3 | | | | | | | | | | | | | | |
| 007 PZR Relief/Quench Tank / 5 | | | | | | | | | | | | | | |
| 008 Component Cooling Water / 8 | | | | | | | | | | | | | | |
| 008 Component Cooling Water / 8 | | | | | | | | | | | | | | |
| 010 Pressurizer Pressure Control / 3 | | | | | | | | | | | | | | |
| 012 Reactor Protection / 7 | | | | | | | | | | | X | 012G2.2.12 – Knowledge of surveillance procedures. | 4.1 | 1 |
| 013 Engineered Safety Features Actuation / 2 | | | | | | | | | | | | | | |

| ES-401 | | PWR Examination Outline Plant Systems – Tier 2 / Group 1 | | | | | | | | | | Form ES-401-2 | | |
|---|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|---|--|-----|---|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 022 Containment Cooling / 5 | | | | | | | | | | | | | | |
| 026 Containment Spray / 5 | | | | | | | | | | | | | | |
| 039 Main and Reheat Steam / 4 | | | | | | | | | | | X | 039G2.4.20 – Knowledge of the operational implications of EOP warnings, cautions, and notes. | 4.3 | 1 |
| 059 Main Feedwater / 4 | | | | | | | | | | | | | | |
| 061 Auxiliary / Emergency Feedwater / 4 | | | | | | | | | | | | | | |
| 062 AC Electrical Distribution / 6 (changed from 062A2.14) | | | | | | | | X | | | | 062A2.01 - Ability to (a) predict the impacts of the following malfunctions or operations on the AC distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Types of loads that, if de-energized, would degrade or hinder plant operation | 3.9 | 1 |
| 063 DC Electrical Distribution / 6 | | | | | | | | | | | | | | |
| 064 Emergency Diesel Generator / 6 | | | | | | | | | | | | | | |
| 073 Process Radiation Monitoring / 7 | | | | | | | | | | | | | | |

| ES-401 | | PWR Examination Outline Plant Systems – Tier 2 / Group 1 | | | | | | | | | | Form ES-401-2 | | |
|------------------------|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|---|---|-----|------|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 076 Service Water / 4 | | | | | | | | X | | | | 076A2.01 - Ability to (a) predict the impacts of the following malfunctions or operations on the RWS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of RWS | 3.7 | 1 |
| 078 Instrument Air / 8 | | | | | | | | | | | | | | |
| 103 Containment / 5 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| K/A Category Totals | | | | | | | | 3 | | | 2 | Group Point Total | | 28/5 |

| ES-401 | | PWR Examination Outline Plant Systems – Tier 2 / Group 2 | | | | | | | | | | Form ES-401-2 | | |
|--|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|---|---|-----|---|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 001 Control Rod Drive / 1 | | | | | | | | | | | | | | |
| 002 Reactor Coolant / 2 & 4 (Changed from 028A2.01) | | | | | | | | X | | | | 002A2.02 - Ability to (a) predict the impacts of the following malfunctions or operations on the RCS; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Loss of coolant pressure | 4.4 | 1 |
| 011 Pressurizer Level Control / 2 | | | | | | | | | | | | | | |
| 014 Rod Position Indication / 1 | | | | | | | | | | | X | 014G2.1.27 - Knowledge of system purpose and / or function. | 4.0 | 1 |
| 015 Nuclear Instrumentation / 7 | | | | | | | | | | | | | | |
| 016 Non-nuclear Instrumentation / 7 | | | | | | | | | | | | | | |
| 017 In-core Temperature Monitor / 7 | | | | | | | | | | | | | | |
| 027 Containment Iodine Removal / 5 | | | | | | | | | | | | | | |
| 028 Hydrogen Recombiner and Purge Control / 5 | | | | | | | | | | | | | | |
| 029 Containment Purge / 8 | | | | | | | | | | | | | | |
| 033 Spent Fuel Pool Cooling / 8 | | | | | | | | | | | | | | |

| ES-401 | | PWR Examination Outline Plant Systems – Tier 2 / Group 2 | | | | | | | | | | Form ES-401-2 | | |
|--|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|---|--|-----|------|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 034 Fuel Handling Equipment / 8 (changed from 027A2.01) | | | | | | | | X | | | | 034A2.01 - Ability to (a) predict the impacts of the following malfunctions or operations on the Fuel Handling System; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Dropped fuel element | 4.4 | 1 |
| 035 Steam Generator / 4 | | | | | | | | | | | | | | |
| 041 Steam Dump/Turbine Bypass Control / 4 | | | | | | | | | | | | | | |
| 045 Main Turbine Generator / 4 | | | | | | | | | | | | | | |
| 055 Condenser Air Removal / 4 | | | | | | | | | | | | | | |
| 056 Condensate / 4 | | | | | | | | | | | | | | |
| 068 Liquid Radwaste / 9 | | | | | | | | | | | | | | |
| 071 Waste Gas Disposal / 9 | | | | | | | | | | | | | | |
| 072 Area Radiation Monitoring / 7 | | | | | | | | | | | | | | |
| 075 Circulating Water / 8 | | | | | | | | | | | | | | |
| 079 Station Air / 8 | | | | | | | | | | | | | | |
| 086 Fire Protection / 8 | | | | | | | | | | | | | | |
| K/A Category Totals | | | | | | | | 2 | | | 1 | Group Point Total | | 10/3 |

SRO

| Facility: | | Crystal River Unit #3 | Date of Exam: | | September, 2009 | |
|---|----------|---|---------------|----|-----------------|---|
| Category | K/A # | Topic | RO | | SRO-Only | |
| | | | IR | # | IR | # |
| 1. Conduct of Operations | 2.1.5 | Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc. | | | 3.9 | 1 |
| | 2.1.8 | Ability to coordinate personnel activities outside the control room. | | | 4.1 | 1 |
| | | | | | | |
| | Subtotal | | | | | 2 |
| 2. Equipment Control | 2.2.37 | Ability to determine operability and/or availability of safety related equipment. | | | 4.6 | 1 |
| | 2.2.43 | Knowledge of the process used to track inoperable alarms. | | | 3.3 | 1 |
| | | | | | | |
| | Subtotal | | | | | 2 |
| 3. Radiation Control | 2.3.15 | Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc. | | | 3.1 | 1 |
| | | | | | | |
| | Subtotal | | | | | 1 |
| 4. Emergency Procedures / Plan | 2.4.3 | Ability to identify post-accident instrumentation. | | | 3.9 | 1 |
| | 2.4.29 | Knowledge of the emergency plan. | | | 4.4 | 1 |
| | | | | | | |
| | Subtotal | | | | | 2 |
| Tier 3 Point Total | | | | 10 | | 7 |

SRO

| Tier/ Group | Randomly Selected K/A | Reason for Rejection |
|----------------|--------------------------|---|
| 1/2 | 061AA2.02 | Not possible to prepare a psychometrically sound question related to this KA. Chief Examiner randomly selected new KA #061AA2.06. |
| 2/1 | 062A2.14 | Not possible to prepare a psychometrically sound question related to this KA. Chief Examiner randomly selected new KA #062A2.01. |
| 2/2 | 027A2.01 | Not applicable to CR3. Containment iodine removal is accomplished via the RB Spray system. There are NO filters associated with this system. Chief Examiner randomly selected new KA #034A2.01. |
| 2/2 | 028A2.01 | Not applicable to CR3. No hydrogen recombiner or hydrogen recombining equipment at CR3. Chief Examiner randomly selected new KA #002A2.02. |
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Facility: Crystal River Unit #3 Date of Exam: 08/31/09 thru 09/18/09

Examination Level: RO ☒ SRO ☒ Operating Test Number: 1

| Administrative Topic (See Note) | Type Code* | Describe activity to be performed |
|------------------------------------|---------------|---|
| Conduct of Operations | D, R | <u>SRO Only</u> – (CO1) – Determine actions for primary to secondary leakage. <i>K/A – G2.1.25 SRO 4.2</i> CP-152 |
| Conduct of Operations | M, R | <u>RO & SRO</u> – (CO2) – Perform a time to boil / core uncover calculation. <i>K/A – G2.1.23 RO 4.3 SRO 4.4</i> OP-103H |
| Equipment Control | D, R | <u>RO & SRO</u> – (EC1) – Perform a monthly NI Imbalance Comparison. <i>K/A – G2.2.12 RO 3.7 SRO 4.1</i> <u>SRO Only</u> – After completing the Imbalance Comparison determine required ITS actions, if any. <i>K/A – G2.2.40 SRO 4.7</i> SP-312B |
| Radiation Control | D, M, P, R | <u>RO & SRO</u> – (RC1) – Calculate the maximum permissible stay time with an Emergency Event in progress. <i>K/A – G2.3.4 RO 3.2 SRO 3.7</i> EM-202 |
| Emergency Procedures / Plan | D, S | <u>RO & SRO</u> – (EP1) – Complete the State of Florida Notification Message form for Nuclear Power Plants and make required notifications. <i>K/A – 2.4.43 RO 3.2 SRO 3.8</i> EM-202 |

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: Crystal River Unit #3 | | Date of Exam: 08/31/09 thru 09/18/09 | |
|---|--|---|--|
| Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input checked="" type="checkbox"/> | | Operating Test Number: 1 | |
| <i>Control Room systems[@] (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)</i> | | | |
| System / JPM Title | Type Code* | Safety Function | |
| a. CA – Perform an RCS Boration K/A – 024AA2.04 RO 3.4 SRO 4.2 (EOP-2) [RO, SRO-I] | A, D, S | 1 | |
| b. CVCS – Restore PZR level during OTSG tube rupture K/A – 006A4.02 RO 4.0 SRO 3.8 (EOP-6) [RO, SRO-I] | A, D, P, S | 2 | |
| c. RCS – Respond to a stuck open PZR spray valve K/A – 002A4.01 RO 4.2 SRO 4.4 (AP-520) [SRO-U] [RO, SRO-I] | A, D, L, P, S | 3 | |
| d. S/GS – Establish EFW flow to raise OTSG level K/A – E03EA1.3 RO 3.6 SRO 3.8 (EOP-3) [RO, SRO-I] | D, S | 4 Primary | |
| e. MSS – Perform actions for a stuck open MSSV K/A – 039A2.04 RO 3.4 SRO 3.7 (EOP-2) [SRO-U] [RO, SRO-I] | D, P, S | 4 Secondary | |
| f. CCS – Ensure proper alignment of ES equipment K/A – 022A4.01 RO 3.6 SRO 3.6 (EOP-2) [SRO-U] [RO, SRO-I] | A, EN, N, S | 5 | |
| g. AC – Energize a dead bus K/A – 062A2.05 RO 2.9 SRO 3.3 (AP-770) [RO] | D, S | 6 | |
| h. ES – Respond to an invalid ES Actuation K/A – 008A3.08 RO 3.6 SRO 3.7 (AP-340) [RO, SRO-I] | A, D, EN, S | 8 | |
| SPARE MU – Restart a MUP following an RCS leak isolation K/A – 002A2.01 RO 4.3 SRO 4.4 (AP-520) | D, S | 2 | |
| <i>In-Plant Systems[@] (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)</i> | | | |
| i. PPCS – Depressurize the RCS using HP Aux. Spray K/A – E14EA1.1 RO 3.8 SRO 3.6 (EOP-14, Enc. 13) [SRO-U] [RO, SRO-I] | D, E, R | 3 | |
| j. DHR – Establish DHR from outside control room K/A – A06AA1.1 RO 4.3 SRO 4.2 (AP-990) [RO, SRO-I] | E, L, N, R | 4 Primary | |
| k. AC – Transfer vital bus to normal power supply K/A – 062A3.04 RO 2.7 SRO 2.9 (OP-703) [SRO-U] [RO, SRO-I] | D | 6 | |
| SPARE FS/OTSG – Transfer excess secondary inventory to FST K/A – 038EK3.06 RO 4.2 SRO 4.5 (EOP-14, Enc. 9) | D, E | 3, 8 | |
| @ | All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room. | | |
| * Type Codes | Criteria for RO / SRO-I / SRO-U | | |
| (A)lternate path | 4-6 / 4-6 / 2-3 | | |
| (C)ontrol room | | | |
| (D)irect from bank | ≤ 9 / ≤ 8 / ≤ 4 | | |
| (E)mergency or abnormal in-plant | ≥ 1 / ≥ 1 / ≥ 1 | | |
| (EN)gineered safety feature | - / - / ≥ 1 | | |
| (L)ow Power / Shutdown | ≥ 1 / ≥ 1 / ≥ 1 | | |
| (N)ew or (M)odified from bank including 1 (A) | ≥ 2 / ≥ 2 / ≥ 1 | | |
| (P)revious 2 exams | ≤ 3 / ≤ 3 / ≤ 2 | | |
| (R)CA | ≥ 1 / ≥ 1 / ≥ 1 | | |
| (S)imulator | | | |