**Facility:** R.E, Ginna Printed: 04/19/2006

Date Of Exam: 07/17/2006

| Tier | Group | RO K/A Category Points | | | | | | | | | | | | SRO-Only Points | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G* | Total | K | A | A2 | G* | Total |
| 1. Emergency & Abnormal Plant Evolutions | 1 | 3 | 3 | 3 | | | | 3 | 3 | | | 3 | 18 | 0 | 0 | 0 | 0 | 0 |
| | 2 | 1 | 2 | 1 | | | | 1 | 2 | | | 2 | 9 | 0 | 0 | 0 | 0 | 0 |
| | Tier Totals | 4 | 5 | 4 | | | | 4 | 5 | | | 5 | 27 | 0 | 0 | 0 | 0 | 0 |
| 2. Plant Systems | 1 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 28 | 0 | 0 | 0 | 0 | 0 |
| | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 0 | 0 | 0 | 0 | 0 |
| | Tier Totals | 3 | 2 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 4 | 38 | 0 | 0 | 0 | 0 | 0 |
| 3. Generic Knowledge And Abilities Categories | | 1 | | | 2 | | | 3 | | | 4 | | 10 | 1 | 2 | 3 | 4 | 0 |
| | | 2 | | | 3 | | | 2 | | | 3 | | | 0 | 0 | 0 | 0 | |

Note:

1. Ensure that at least two topics from every 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).
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.
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 the outline should be added. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.
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.
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.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
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.
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. Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topices 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.

# PWR RO Examination Outline

Printed: 04/19/2006

**Facility:** R.E, Ginna

**ES - 401** **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-2**

| E/APE # / Name / Safety Function | K1 | K2 | K3 | A1 | A2 | G | KA Topic | Imp. | Points |
|---|---|---|---|---|---|---|---|---|---|
| 000007 Reactor Trip - Stabilization - Recovery / 1 | X | | | | | | EK1.05 - Decay power as a function of time | 3.3 | 1 |
| 000009 Small Break LOCA / 3 | | X | | | | | EK2.03 - S/Gs | 3.0 | 1 |
| 000011 Large Break LOCA / 3 | X | | | | | | EK1.01 - Natural circulation and cooling, including reflux boiling | 4.1 | 1 |
| 000015/000017 RCP Malfunctions / 4 | | | | | X | | AA2.01 - Cause of RCP failure | 3.0 | 1 |
| 000022 Loss of Rx Coolant Makeup / 2 | | | | X | | | AA1.08 - VCT level | 3.4 | 1 |
| 000025 Loss of RHR System / 4 | | X | | | | | AK2.02 - LPI or Decay Heat Removal/RHR pumps | 3.2* | 1 |
| 000026 Loss of Component Cooling Water / 8 | | | X | | | | AK3.03 - Guidance actions contained in EOP for Loss of CCW | 4.0 | 1 |
| 000027 Pressurizer Pressure Control System Malfunction / 3 | | | | | | X | 2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation. | 3.9 | 1 |
| 000029 ATWS / 1 | | | | | X | | EA2.05 - System component valve position indications | 3.4* | 1 |
| 000054 Loss of Main Feedwater / 4 | | | X | | | | AK3.05 - HPI/PORV cycling upon total feedwater loss | 4.6 | 1 |
| 000055 Station Blackout / 6 | | | | | | X | 2.4.31 - Knowledge of annunciators alarms and indications, and use of the response instructions. | 3.3 | 1 |
| 000056 Loss of Off-site Power / 6 | | | | | | X | 2.4.6 - Knowledge symptom based EOP mitigation strategies. | 3.1 | 1 |
| 000058 Loss of DC Power / 6 | X | | | | | | AK1.01 - Battery charger equipment and instrumentation | 2.8 | 1 |
| 000062 Loss of Nuclear Svc Water / 4 | | | | X | | | AA1.07 - Flow rates to the components and systems that are serviced by the SWS; interactions among the components | 2.9 | 1 |
| 000065 Loss of Instrument Air / 8 | | | X | | | | AK3.03 - Knowing effects on plant operation of isolating certain equipment from instrument air | 2.9 | 1 |
| W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4 | | | | | X | | EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments | 3.7 | 1 |
| W/E11 Loss of Emergency Coolant Recirc. / 4 | | | | X | | | EA1.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features | 3.9 | 1 |

# PWR RO Examination Outline

Printed: 04/19/2006

**Facility:** R.E, Ginna

**ES - 401** **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-2**

| E/APE # / Name / Safety Function | K1 | K2 | K3 | A1 | A2 | G | KA Topic | Imp. | Points |
|---|---|---|---|---|---|---|---|---|---|
| W/E12 - Steam Line Rupture - Excessive Heat Transfer / 4 | | X | | | | | EK2.2 - Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility | 3.6 | 1 |
| **K/A Category Totals:** | **3** | **3** | **3** | **3** | **3** | **3** | **Group Point Total:** | | **18** |

# PWR RO Examination Outline

Printed: 04/19/2006

**Facility:** R.E, Ginna

**ES - 401** **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2** **Form ES-401-2**

| E/APE # / Name / Safety Function | K1 | K2 | K3 | A1 | A2 | G | KA Topic | Imp. | Points |
|---|---|---|---|---|---|---|---|---|---|
| 000001 Continuous Rod Withdrawal / 1 | | | | | X | | AA2.05 - Uncontrolled rod withdrawal, from available indications | 4.4 | 1 |
| 000003 Dropped Control Rod / 1 | | | | | | X | 2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation. | 3.9 | 1 |
| 000024 Emergency Boration / 1 | | | X | | | | AK3.02 - Actions contained in EOP for emergency boration | 4.2 | 1 |
| 000028 Pressurizer Level Malfunction / 2 | | X | | | | | AK2.02 - Sensors and detectors | 2.6 | 1 |
| 000036 Fuel Handling Accident / 8 | | | | | | X | 2.1.2 - Knowledge of operator responsibilities during all modes of plant operation. | 3.0 | 1 |
| 000060 Accidental Gaseous Radwaste Rel. / 9 | | X | | | | | AK2.01 - ARM system, including the normal radiation-level indications and the operability status | 2.6 | 1 |
| 000067 Plant Fire On-site / 9 | | | | | X | | AA2.04 - The fire's extent of potential operational damage to plant equipment | 3.1 | 1 |
| W/E06 Inad. Core Cooling / 4 | | | | X | | | EA1.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features | 3.8 | 1 |
| E09 Natural Circ. / 4 | X | | | | | | EK1.3 - Annunciators and conditions indicating signals, and remedial actions associated with the Natural Circulation Operations | 3.3 | 1 |
| **K/A Category Totals:** | 1 | 2 | 1 | 1 | 2 | 2 | **Group Point Total:** | | 9 |

# PWR RO Examination Outline

Printed: 04/19/2006

**Facility:** R.E, Ginna

**ES - 401** **Plant Systems - Tier 2 / Group 1** **Form ES-401-2**

| Sys/Evol # / Name | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | KA Topic | Imp. | Points |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 003 Reactor Coolant Pump | X | | | | | | | | | | | K1.10 - RCS | 3.0 | 1 |
| 004 Chemical and Volume Control | | | | X | | | | | | | | K4.13 - Interlock between letdown isolation valve and flow control valve | 3.2* | 1 |
| 004 Chemical and Volume Control | | | | | | X | | | | | | K6.31 - Seal injection system and limits on flow range | 3.1 | 1 |
| 005 Residual Heat Removal | | | | | | X | | | | | | K6.03 - RHR heat exchanger | 2.5 | 1 |
| 005 Residual Heat Removal | | | | | | | | | | | X | 2.1.32 - Ability to explain and apply all system limits and precautions. | 3.4 | 1 |
| 006 Emergency Core Cooling | | | | X | | | | | | | | K4.17 - Safety Injection valve interlocks | 3.8 | 1 |
| 007 Pressurizer Relief/Quench Tank | | | | | X | | | | | | | K5.02 - Method of forming a steam bubble in the PZR | 3.1 | 1 |
| 008 Component Cooling Water | | | | | | | | X | | | | A2.02 - High/low surge tank level | 3.2 | 1 |
| 008 Component Cooling Water | | | | | | | | | | X | | A4.10 - Conditions that require the operation of two CCW coolers | 3.1* | 1 |
| 010 Pressurizer Pressure Control | | X | | | | | | | | | | K2.02 - Controller for PZR spray valve | 2.5 | 1 |
| 012 Reactor Protection | | | | | X | | | | | | | K5.02 - Power density | 3.1* | 1 |
| 012 Reactor Protection | | | | | | | | | | X | | A4.02 - Components for individual channels | 3.3 | 1 |
| 013 Engineered Safety Features Actuation | | | X | | | | | | | | | K3.01 - Fuel | 4.4 | 1 |
| 022 Containment Cooling | | | | | | | | | | | X | 2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation. | 3.9 | 1 |
| 022 Containment Cooling | | | | X | | | | | | | | K4.02 - Correlation of fan speed and flowpath changes with containment pressure | 3.1* | 1 |
| 026 Containment Spray | | | | | | | | X | | | | A2.07 - Loss of containment spray pump suction when in recirculation mode, possibly caused by clogged sump screen, pump inlet high temperature exceeded cavitation, voiding), or sump level below cutoff (interlock) limit | 3.6 | 1 |
| 039 Main and Reheat Steam | | | | | | | X | | | | | A1.05 - RCS T-ave | 3.2* | 1 |
| 059 Main Feedwater | | | X | | | | | | | | | K3.04 - RCS | 3.6 | 1 |
| 059 Main Feedwater | | | | | | | | | | X | | A4.12 - Initiation of | 3.4 | 1 |

# PWR RO Examination Outline

Printed: 04/19/2006

**Facility:** R.E, Ginna

**ES - 401** **Plant Systems - Tier 2 / Group 1** **Form ES-401-2**

| Sys/Evol # / Name | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | KA Topic<br>automatic feedwater isolation | Imp. | Points |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 061 Auxiliary/Emergency Feedwater | | | | | X | | | | | | | K5.05 - Feed line voiding and water hammer | 2.7 | 1 |
| 062 AC Electrical Distribution | | | | | | | | | X | | | A3.05 - Safety-related indicators and controls | 3.5 | 1 |
| 063 DC Electrical Distribution | | | | | | | | X | | | | A2.01 - Grounds | 2.5 | 1 |
| 064 Emergency Diesel Generator | X | | | | | | | | | | | K1.02 - ED/G cooling water system | 3.1 | 1 |
| 073 Process Radiation Monitoring | | | | | | | X | | | | | A1.01 - Radiation levels | 3.2 | 1 |
| 076 Service Water | | | | | | | | | X | | | A3.02 - Emergency heat loads | 3.7 | 1 |
| 078 Instrument Air | | X | | | | | | | | | | K2.01 - Instrument air compressor | 2.7 | 1 |
| 103 Containment | | | X | | | | | | | | | K3.02 - Loss of containment integrity under normal operations | 3.8 | 1 |
| 103 Containment | | | | | | | | | | | X | 2.1.14 - Knowledge of system status criteria which require the notification of plant personnel. | 2.5 | 1 |
| **K/A Category Totals:** | **2** | **2** | **3** | **3** | **3** | **2** | **2** | **3** | **2** | **3** | **3** | **Group Point Total:** | | **28** |

# PWR RO Examination Outline

Printed: 04/19/2006

**Facility:** R.E, Ginna

**ES - 401** **Plant Systems - Tier 2 / Group 2** **Form ES-401-2**

| Sys/Evol # / Name | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | KA Topic | Imp. | Points |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 Control Rod Drive | | | | | | | | | X | | | A3.04 - Radial imbalance | 3.5 | 1 |
| 011 Pressurizer Level Control | X | | | | | | | | | | | K1.04 - RPS | 3.8 | 1 |
| 017 In-core Temperature Monitor | | | | | | | X | | | | | A1.01 - Core exit temperature | 3.7 | 1 |
| 034 Fuel Handling Equipment | | | | | | | | | | X | | A4.01 - Radiation levels | 3.3 | 1 |
| 041 Steam Dump/Turbine Bypass Control | | | | | X | | | | | | | K5.06 - Effect of power change on fuel cladding | 2.5 | 1 |
| 055 Condenser Air Removal | | | X | | | | | | | | | K3.01 - Main condenser | 2.5 | 1 |
| 068 Liquid Radwaste | | | | X | | | | | | | | K4.01 - Safety and environmental precautions for handling hot, acidic, and radioactive liquids | 3.4 | 1 |
| 072 Area Radiation Monitoring | | | | | | | | | | | X | 2.1.33 - Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. | 3.4 | 1 |
| 079 Station Air | | | | | | | | X | | | | A2.01 - Cross-connection with IAS | 2.9 | 1 |
| 086 Fire Protection | | | | | | X | | | | | | K6.04 - Fire, smoke, and heat detectors | 2.6 | 1 |
| **K/A Category Totals:** | **1** | **0** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **Group Point Total:** | | **10** |

## Generic Knowledge and Abilities Outline (Tier 3)

## PWR RO Examination Outline

Printed: 04/19/2006

Facility: R.E, Ginna

**Form ES-401-3**

| Generic Category | KA | KA Topic | Imp. | Points |
|---|---|---|---|---|
| Conduct of Operations | 2.1.3 | Knowledge of shift turnover practices. | 3.0 | 1 |
| | 2.1.28 | Knowledge of the purpose and function of major system components and controls. | 3.2 | 1 |
| | | **Category Total:** | | **2** |
| Equipment Control | 2.2.22 | Knowledge of limiting conditions for operations and safety limits. | 3.4 | 1 |
| | 2.2.27 | Knowledge of the refueling process. | 2.6 | 1 |
| | 2.2.34 | Knowledge of the process for determining the internal and external effects on core reactivity. | 2.8 | 1 |
| | | **Category Total:** | | **3** |
| Radiation Control | 2.3.9 | Knowledge of the process for performing a containment purge. | 2.5 | 1 |
| | 2.3.11 | Ability to control radiation releases. | 2.7 | 1 |
| | | **Category Total:** | | **2** |
| Emergency Procedures/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 |
| | 2.4.22 | Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations. | 3.0 | 1 |
| | 2.4.24 | Knowledge of loss of cooling water procedures. | 3.3 | 1 |
| | | **Category Total:** | | **3** |
| | | **Generic Total:** | | **10** |

| Tier / Group | Randomly Selected K/A | Reason for Rejection |
|---|---|---|
| 1 / 2 | 067 AA2.05 | Replaced 067 AA2.05 could not write appropriate written exam question from KA based on Ginna procedures. Selected replacement (AA2.04) from same category using poker chip method. Developed In-Plant JPM to evaluate 067 AA2.05. |
| 2 /2 | 011 K2.02 | Replaced 011 K2.02 since 010 K2.02 already selected which gives 2 power supply questions on PRZR control systems. Randomly selected replacement (K1.04) using poker chip method from K1 category since no K1 had been selected in this Tier/Group. |
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**Facility:** R.E, Ginna Printed: 08/03/2006

Date Of Exam: 07/17/2006

| Tier | Group | RO K/A Category Points | | | | | | | | | | | | SRO-Only Points | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G* | Total | K | A | A2 | G* | Total |
| 1. Emergency & Abnormal Plant Evolutions | 1 | 0 | 0 | 0 | | | | 0 | 0 | | | 0 | 0 | 0 | 0 | 3 | 3 | 6 |
| | 2 | 0 | 0 | 0 | | | | 0 | 0 | | | 0 | 0 | 0 | 0 | 2 | 2 | 4 |
| | Tier Totals | 0 | 0 | 0 | | | | 0 | 0 | | | 0 | 0 | 0 | 0 | 5 | 5 | 10 |
| 2. Plant Systems | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 5 |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 3 |
| | Tier Totals | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 3 | 8 |
| 3. Generic Knowledge And Abilities Categories | | 1 | | | 2 | | | 3 | | | 4 | | 0 | 1 | 2 | 3 | 4 | 7 |
| | | 0 | | | 0 | | | 0 | | | 0 | | | 1 | 2 | 2 | 2 | |

Note:

1. Ensure that at least two topics from every 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).
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.
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 the outline should be added. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.
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.
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.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
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.
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. Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topices 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.

# PWR SRO Examination Outline

Printed: 08/03/2006

**Facility:** R.E, Ginna

**ES - 401** **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-2**

| E/APE # / Name / Safety Function | K1 | K2 | K3 | A1 | A2 | G | KA Topic | Imp. | Points |
|---|---|---|---|---|---|---|---|---|---|
| 000007 Reactor Trip - Stabilization - Recovery / 1 | | | | | | X | 2.1.33 - Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. | 4.0 | 1 |
| 000022 Loss of Rx Coolant Makeup / 2 | | | | | X | | AA2.01 - Whether charging line leak exists | 3.8 | 1 |
| 000027 Pressurizer Pressure Control System Malfunction / 3 | | | | | X | | AA2.06 - Conditions requiring plant shutdown | 3.9 | 1 |
| 000038 Steam Gen. Tube Rupture / 3 | | | | | | X | 2.4.6 - Knowledge symptom based EOP mitigation strategies. | 4.0 | 1 |
| 000054 Loss of Main Feedwater / 4 | | | | | X | | AA2.05 - Status of MFW pumps, regulating and stop valves | 3.7 | 1 |
| 000057 Loss of Vital AC Inst. Bus / 6 | | | | | | X | 2.4.6 - Knowledge symptom based EOP mitigation strategies. | 4.0 | 1 |
| **K/A Category Totals:** | **0** | **0** | **0** | **0** | **3** | **3** | **Group Point Total:** | | **6** |

# PWR SRO Examination Outline

Printed: 08/03/2006

**Facility:** R.E, Ginna

**ES - 401** **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2** **Form ES-401-2**

| E/APE # / Name / Safety Function | K1 | K2 | K3 | A1 | A2 | G | KA Topic | Imp. | Points |
|---|---|---|---|---|---|---|---|---|---|
| 000024 Emergency Boration / 1 | | | | | X | | AA2.05 - Amount of boron to add to achieve required SDM | 3.9 | 1 |
| 000059 Accidental Liquid RadWaste Rel. / 9 | | | | | | X | 2.1.33 - Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. | 4.0 | 1 |
| W/E10 Natural Circ. / 4 | | | | | X | | EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments | 3.9 | 1 |
| W/E16 High Containment Radiation / 9 | | | | | | X | 2.4.30 - Knowledge of which events related to system operations/status should be reported to outside agencies. | 3.6 | 1 |
| **K/A Category Totals:** | **0** | **0** | **0** | **0** | **2** | **2** | **Group Point Total:** | | **4** |

# PWR SRO Examination Outline

Printed: 08/03/2006

**Facility:** R.E, Ginna

**ES - 401** — **Plant Systems - Tier 2 / Group 1** — **Form ES-401-2**

| Sys/Evol # / Name | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | KA Topic | Imp. | Points |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 005 Residual Heat Removal | | | | | | | | | | | X | 2.4.4 - Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. | 4.3 | 1 |
| 061 Auxiliary/Emergency Feedwater | | | | | | | | | | | X | 2.2.25 - Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. | 3.7 | 1 |
| 062 AC Electrical Distribution | | | | | | | | X | | | | A2.05 - Methods for energizing a dead bus | 3.3* | 1 |
| 064 Emergency Diesel Generator | | | | | | | | X | | | | A2.17 - Consequences of not shedding loads during nonoperability test | 2.6* | 1 |
| 076 Service Water | | | | | | | | X | | | | A2.02 - Service water header pressure | 3.1 | 1 |
| **K/A Category Totals:** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** | **0** | **0** | **2** | **Group Point Total:** | | **5** |

# PWR SRO Examination Outline

Printed: 08/03/2006

**Facility:** R.E, Ginna

**ES - 401** **Plant Systems - Tier 2 / Group 2** **Form ES-401-2**

| Sys/Evol # / Name | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | KA Topic | Imp. | Points |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 029 Containment Purge | | | | | | | | | | | X | 2.4.30 - Knowledge of which events related to system operations/status should be reported to outside agencies. | 3.6 | 1 |
| 034 Fuel Handling Equipment | | | | | | | | X | | | | A2.03 - Mispositioned fuel element | 4.0 | 1 |
| 086 Fire Protection | | | | | | | | X | | | | A2.04 - Failure to actuate the FPS when required, resulting in fire damage | 3.9 | 1 |
| **K/A Category Totals:** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | **Group Point Total:** | | 3 |

## Generic Knowledge and Abilities Outline (Tier 3)

## PWR SRO Examination Outline

Printed: 08/03/2006

**Facility:** R.E, Ginna

**Form ES-401-3**

| Generic Category | KA | KA Topic | Imp. | Points |
|---|---|---|---|---|
| **Conduct of Operations** | 2.1.7 | Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. | 4.4 | 1 |
| | | **Category Total:** | | **1** |
| **Equipment Control** | 2.2.5 | Knowledge of the process for making changes in the facility as described in the safety analysis report. | 2.7 | 1 |
| | 2.2.25 | Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. | 3.7 | 1 |
| | | **Category Total:** | | **2** |
| **Radiation Control** | 2.3.4 | Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. | 3.1 | 1 |
| | 2.3.8 | Knowledge of the process for performing a planned gaseous radioactive release. | 3.2 | 1 |
| | | **Category Total:** | | **2** |
| **Emergency Procedures/Plan** | 2.4.1 | Knowledge of EOP entry conditions and immediate action steps. | 4.6 | 1 |
| | 2.4.46 | Ability to verify that the alarms are consistent with the plant conditions. | 3.6 | 1 |
| | | **Category Total:** | | **2** |
| | | **Generic Total:** | | 7 |

| Tier / Group | Randomly Selected K/A | Reason for Rejection |
|---|---|---|
| 2 / 2 | 034 A1.02 | Randomly selected 034 A2.03 using poker chip method due to inappropriate selection of an A1 KA on original outline |
| 1/1 | 038 G2.4.41 | Replaced with 038 G2.4.6 due to NRC concern with over sampling of Emergency Plan KAs in the origimal outline. |
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Facility: R.E. Ginna Date of Examination: 7/17/2006

Examination Level: RO ☒ SRO ☐ Operating Test Number: 06-1

| Administrative Topic (see Note) | Type Code* | Describe activity to be performed |
|---|---|---|
| Conduct of Operations | D, C | Perform a Plant Calorimetric<br>JR015.004 (2.1.7) |
| Conduct of Operations | M, S | O-6.13 Channel Checks<br>JR341.002 (2.1.31) |
| Equipment Control | M, R | Control of LCO's for Equipment Out of Service<br>JR343.005 (2.2.23) |
| Radiation Control | | |
| Emergency Plan | N, S | Complete Plant Status Report from EPIP 1-5 with the<br>PPCS Out of Service JC119.001 (2.4.39) |

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: R.E. Ginna | Date of Examination: 7/17/2006

Examination Level: RO ☐ SRO ☒ | Operating Test Number: 06-1

| Administrative Topic (see Note) | Type Code* | Describe activity to be performed |
|---|---|---|
| Conduct of Operations | N, S | Implement the Hazardous Spill Response Plan<br>JS345.001 (2.1.26) |
| Conduct of Operations | P, R | Loss of Safety Function Determination<br>JS343.006 (2.1.12) |
| Equipment Control | D, R | Verify Equipment Tagout Boundary<br>JS119.001 (2.2.13) |
| Radiation Control | D, R | Approve Liquid Release Form (CH-RETS-LIQ-REL, Figure V) JS069.001 (2.3.6) |
| Emergency Plan | N, S | Event Classification<br>JS341.021 (2.4.41) |

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: R. E. Ginna Date of Examination: 7/17/2006

Exam Level: RO ☒ SRO-I ☐ SRO-U ☐ Operating Test No.: 06-1

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

| | Type Code* | Safety Function |
|---|---|---|
| a. Rod Control / Realign a Missaligned Rod JR001.013 | N, S | 1 |
| b. Chemical and Volume Control / Burp the VCT for H2 Removal JR004.012 Option 2 | N, A, S | 2 |
| c. ECCS / Nitrogen Makeup to the Accumulators JR006.002 | D, S | 3 |
| d. Reactor Coolant Pump System / Start a RCP per Attachment RCP Start JR003.001 Option 3 | M,A, S, L | 4 |
| e. Containment System / Manually close Isolation Valves on a CI Failure JR103.007 Option2 | N, A, S, L | 5 |
| f. Emergency Diesel Generators / Start and Load the "A" DG per PT-12.1 JR 064.002 Option 2 | M, A, S | 6 |
| g. Reactor Protection System / Defeat a Failed Pressurizer Pressure Channel JR012.001 | D, S | 7 |
| h. Containment Purge System / Startup CNMT Mini-Purge System JR029.001 Option 2 | D, P, A, S | 8 |
| In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U) | | |
| i. Plant Fire System / Secure Ventilation Systems During a Fire JN086.002 | N, R, E | 8 |
| j. Steam Generator System / Perform Attachment Ruptured Steam Generator Part B JC035.006 | D, E, L | 4 |
| k. Waste Gas Disposal System / Release the A GDT per S-4.2.5 JN071.002 | N, R | 9 |

@ 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 |
| (L)ow-Power / Shutdown | ≥ 1 / ≥ 1 / ≥ 1 |
| (N)ew or (M)odified from bank including 1(A) | ≥ 2 / ≥ 2 / ≥ 1 |
| (P)revious 2 exams | ≤ 3 / ≤ 3 / ≤ 2 (randomly selected) |
| (R)CA | ≥ 1 / ≥ 1 / ≥ 1 |
| (S)imulator | |

Facility: R. E. Ginna Date of Examination: 7/17/2006

Exam Level: RO ☐ SRO-I ☐ SRO-U ☒ Operating Test No.: 06-1

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

| | Type Code* | Safety Function |
|---|---|---|
| a. Rod Control / Realign a Missaligned Rod JR001.012 | N, S | 1 |
| b. Containment System / Manually close Isolation Valves on a CI Failure JR103.007 Option 2 | N, A, S, L | 5 |
| c. Emergency Diesel Generators / Start and Load the "A" DG per PT-12.1 JR 064.002 Option 2 | M, A, S, ESF | 6 |
| d. | | |
| e. | | |
| f. | | |
| g. | | |
| h. | | |
| In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U) | | |
| i. Plant Fire System / Secure Ventilation Systems During a Fire JN086.002 | N, R, E | 8 |
| j. Steam Generator System / Perform Attachment Ruptured Steam Generator Part B JC035.006 | D, E, L | 4 |
| k. | | |

@ 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 |
| (L)ow-Power / Shutdown | ≥ 1 / ≥ 1 / ≥ 1 |
| (N)ew or (M)odified from bank including 1(A) | ≥ 2 / ≥ 2 / ≥ 1 |
| (P)revious 2 exams | ≤ 3 / ≤ 3 / ≤ 2 (randomly selected) |
| (R)CA | ≥ 1 / ≥ 1 / ≥ 1 |
| (S)imulator | |

Facility: R. E. Ginna Scenario No.: 1 Op-Test No.: 06-1

Examiners: T. Fish Operators: _____

G. Johnson _____

D. Silk _____

Initial Conditions: 3% Power during a Startup , MOL,
Auto SI Failure, "A" D/G Fails to Auto Start

Turnover:

3% Power during a startup. O-1.2 complete up to step 5.4.3.17. MFW Pump A is ready to start and MFW Pump A Attachment of O-1.2 has been completed through step 8. RCS Boron is 1335 ppm. No equipment is OOS. Start MFW Pump A, transistion to MFW and prepare to roll the turbine.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | ------- | BOP (N)<br>SRO (N) | Start "A" MFW Pump, Transition to MFW |
| 2 | ------- | RO (R)<br>SRO (N) | Increase Power in preparation to roll turbine |
| 3 | PZR-1A | RO (C)<br>SRO (C) | Spray Valve Control PCV-431A fails causing the spray valve to open |
| 4 | FDW-7A | BOP (C)<br>SRO (C) | "A" MFRV Fails open (Manual Control available) |
| 5 | EDS-4B | RO,SRO (C)<br>SRO (TS) | Bus 16 Normal Feed Trips (Bus Fault) |
| 6 | RCS-15C<br>RCS-15D | RO (C)<br>SRO(C,TS) | RCP High Vibration ("B" RCP) Rx Manual Trip required. |
| 7 | RCS-12B<br>RCS-13B<br>RCS-14B | ALL (M) | 300 gpm LOCA from the "B" RCP Seal Package |
| 8 | SIS-2 | RO (C)<br>SRO (C) | SI Fails to Actuate |
| 9 | EDS-6 | ALL (M) | Loss of Offsite Power after SI Reset. (manually restart SI equipment) |
| 10 | GEN-08 | BOP (C) | "A" Diesel Generator Auto Start Failure requiring Manual Start |
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* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: R. E. Ginna Scenario No.: 2 Op-Test No.: 06-1

Examiners: T. Fish Operators: _____

G. Johnson _____

D. Silk _____

Initial Conditions: 70% Power, MOL, RCS Boron 900 ppm, "B" MDAFW pump is OOS for motor work. "B" SW Pump OOS for motor replacement.

Turnover:

70% Power, MOL, RCS Boron 900 ppm, 11,000 ppm in BASTs. "B" MFW Pump retruned to service 4 hours ago following repairs. Holding power at 70 % for secondary chemistry. Control Rods are in Manual. "B" MDAFW pump is OOS for motor work. The AFW System valves are not held. The "B" SW Pump is OOS for motor replacement. A52-4 submitted for both.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | CND-4C OVR CND-08F | BOP (C) SRO (C) | Condensate Pump Trips, Standby Pump fails to Auto Start |
| 2 | ------- | RO (R) SRO,BOP (N) | Plant power redution to 50% due to report of MFW Pump "B" problems |
| 3 | RCS-16 | RO,SRO (C) SRO (TS) | Fuel Cladding Failure |
| 4 | CVC-2 | RO (C) SRO (C) | Letdown Line 30 gpm Leak (Leak isolation is a Critical Task) |
| 5 | SGN-3D STM-2B | SRO (TS) | Steam Leak on PT-479 causing low failure |
| 6 | SGN-4B | ALL (M) | 300 gpm SGTR in "B" S/G (Ruptured - Faulted S/G) |
| 7 | RPS-5A/B | RO (C) SRO (C) | Reactor Fails to Auto Trip (Manual Trip Available) |
| 8 | RPS-7K LOA FDW 30 | BOP (C) SRO (C) | Loss of AFW (MDAFW Pump "A" Fails to Auto Start, TDAFW Pump Trips on start. Manual start "A" MDAFW Pump available) |
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* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: R. E. Ginna Scenario No.: 3 - (SPARE) Op-Test No.: 06-1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 100% Power, MOL, RCS Boron 845 ppm, "B" SIP fails to Auto Start. "A" SIP OOS for motor work. "B" Charging Pump OOS for Belt Replacement "B" SW Pump OOS for motor work

Turnover:

100% Power, MOL, RCS Boron 845 ppm, Xenon equilibrium, "A" SIP OOS for motor work. "B" Charging Pump OOS for Belt Replacement. "B" SW Pump OOS for motor work

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | RCS-11J | RO (I)<br>SRO (I,TS) | Loop B Thot fails high. Rods Step Out, manual rod control. Defeat channel per ER-INST.1 |
| 2 | CLG-06 | RO (C)<br>SRO (C) | CCW Seal Return cooler leak (20 gpm) |
| 3 | ANN-OVR<br>EDS-11 | BOP (N)<br>RO (R)<br>SRO (N) | Main Generator Isophase Bus Duct coolers fail requiring a rapid load reduction to 70% power |
| 4 | ROD-3 | RO (C)<br>SRO (C,TS) | Rod Lift Coil fails causing the rod not to move when called for during power reduction |
| 5 | CLG-1D | BOP (C)<br>SRO (C,TS) | "D" SW Pump trip requiring manual start of "C" SW Pump - Entry into SW T.S, "C" SW Pump fails to start. Enter AP-SW.2, Loss of SW. |
| 6 | SIS-1A<br>RCS-19D | ALL (M) | Inadvertant SI with 853B check valve failure resulting a LOCA Outside CNMT |
| 7 | RPS-7B | RO (C) | "B" SIP fails to Auto Start |
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* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor