

February 20, 2002

Mr. Alan Blamey
USNRC Chief Examiner
USNRC Region 1
475 Allendale Road
King of Prussia, PA 19406-1415



Susquehanna Learning Center
Examination Outline
PLA 005447 File A14-13D

Dear Alan:

Enclosed are the Written and Operating Examination Outlines for the Susquehanna Steam Electric Station operator examination currently scheduled for August 2002. This information is being provided in accordance with NUREG 1021 Operating Examination Standards for Power Reactors, Rev 8, Supplement 1.

Included are the following completed Examiner Standard forms:

- ES-201-2 Examination Outline Quality Checklist
- ES-301-1 Administrative Topics Outline (SRO and RO)
- ES-301-2 Control Room Systems and Facility Walk-Through Test Outline (SRO and RO)
- ES-401-1 BWR SRO Examination Outline
- ES-401-2 BWR RO Examination Outline
- ES-401-5 Generic Knowledge and Abilities Outline (Tier 3)
- ES-D-1 Scenario Outline
- ES-301-5 Transient and Event Checklist
- ES-301-6 Competencies Checklist
- ES-401-10 Record of Rejected K/As

Susquehanna Steam Electric Station requests that the enclosed materials be withheld from public disclosure until after the August 2002 examination process is complete.

If you have any questions, please feel free to contact me at 570-542-3619.

Sincerely,

Walter W. Hunt
SSES Training Manager

Response: No

Enclosures: Written and Operating Examination Outlines

cc: J. M. Helsel
Ops Letter File
Nuc Records-Site

jmexamoutlines

JM/WWH/vah

May 23, 2002



Mr. Alan Blamey
USNRC Chief Examiner
USNRC Region 1
475 Allendale Road
King of Prussia, PA 19406-1415

Susquehanna Learning Center
Examination Outline
PLA 005485 PLI A14-13D

Dear Alan:

Enclosed are the revised portions of the Written and Operating Examination Outlines for the Susquehanna Steam Electric Station operator examination scheduled for August 2002. As per your request, only those forms that were modified from the original 'draft' submittal dated February 20, 2002 are included. Please remove the applicable forms, and replace with those provided in this transmittal. This information is being provided in accordance with NUREG 1021 Operating Examination Standards for Power Reactors, Rev 8, Supplement 1.

Included are the following completed Examiner Standard Forms:

- ES-201-2 Examination Outline Quality Checklist
- ES-301-1 Administrative Topics Outline (SRO and RO)
- ES-301-2 Control Room Systems and Facility Walk-Through Test Outline (SRO and RO)
- ES-301-5 Transient and Event Checklist
- ES-301-6 Competencies Checklist
- ES-D-1 Scenario Outline

Susquehanna Steam Electric Station requests that the enclosed materials be withheld from public disclosure until after the August 2002 examination process is complete.

If you have any questions, please feel free to contact me at 570-542-3619.

Sincerely,

Walter W. Hunt
Manager - Nuclear Training

Response: No

Enclosures

cc: J. M. Helsel
Ops Letter File
Nuc Records-Site

jmnrceexamoutlineletter2
JDM/WWH/vah

| Facility: SSES | | Date of Exam: 08/12/02 | | Exam Level: SRO | | | | | | | | | |
|--|-------------|------------------------|-----|-----------------|-----|-------|-------|-------|-------|-----|-----|-----|-------------|
| Tier | Group | K/A Category Points | | | | | | | | | | | Point Total |
| | | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G * | |
| 1. Emergency & Abnormal Plant Evolutions | 1 | 4 | 4 | 5 | | | | 4 | 5 | | | 4 | 26 |
| | 2 | 3 | 3 | 2 | | | | 3 | 3 | | | 3 | 17 |
| | Tier Totals | 7 | 7 | 7 | | | | 7 | 8 | | | 7 | 43 |
| | | | | | | | | | | | | | |
| 2. Plant Systems | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 23 |
| | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 13 |
| | 3 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 4 |
| | Tier Totals | 3 | 3 | 5 | 3 | 4 | 4 | 3 | 4 | 3 | 2 | 6 | 40 |
| 3. Generic Knowledge and Abilities | | | | | | Cat 1 | Cat 2 | Cat 3 | Cat 4 | 17 | | | |
| | | | | | | 4 | 4 | 4 | 5 | | | | |
| <p>Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., 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 exam must total 100 points.</p> <p>3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>6.* The generic 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.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p> | | | | | | | | | | | | | |

ES-401 BWR SRO Examination OutlineForm ES-401-1 (R8, S1)
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) | Imp. | Point s |
|--|----------|----------|----------|----------|----------|----------|---|------------|------------|
| 295003 Partial or Complete Loss of AC Pwr / 6 | | X | | | | X | AK2.01 Station batteries 2.1.33 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications | 3.3 4.0 | 2 |
| 295006 SCRAM / 1 | X | | | X | | | AK1.03 Reactivity control AA1.04 Recirculation system | 4.0 3.2 | 2 |
| 295007 High Reactor Pressure / 3 | | X | X | | | | AK2.02 Reactor power AK3.06 Reactor/turbine pressure regulating system operation | 3.8 3.8 | 2 |
| 295009 Low Reactor Water Level / 2 | | | | | X | | AA2.03 Reactor water cleanup blowdown rate | 2.9 | 1 |
| 295010 High Drywell Pressure / 5 | | X | | X | | | AK2.01 Suppression pool level AA1.02 Drywell floor and equipment drain sumps | 3.3 3.6 | 2 |
| 295013 High Suppression Pool Temp. / 5 | | | | | X | X | AA2.02 Localized heating/stratification 2.4.31 Knowledge of annunciators alarms and indications, and use of the response instructions | 3.6 3.4 | 2 |
| 295014 Inadvertent Reactivity Addition / 1 | | | X | | | | AK3.02 Control rod blocks | 3.7 | 1 |
| 295016 Incomplete SCRAM / 1 | | | | | | | | | |
| 295016 Control Room Abandonment / 7 | | | | | X | X | AA2.04 Suppression pool temperature 2.1.14 Knowledge of system status criteria which require the notification of plant personnel | 4.1 3.3 | 2 |
| 295017 High Off-site Release Rate / 9 | X | | | | | X | AK1.02 Protection of the general public 2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies | 4.3 3.6 | 2 |
| 295023 Refueling Accidents Cooling Mode / 8 | | | | | | | | | |
| 295024 High Drywell Pressure / 5 | X | | X | | | | EK1.01 Drywell integrity: Plant-Specific EK3.09 Auxiliary building isolation: Plant-Specific | 4.2 3.6 | 2 |
| 295026 High Reactor Pressure / 3 | | | | | | | | | |
| 295026 Suppression Pool High Water Temp. / 5 | | | X | | X | | EK3.03 Suppression pool spray: Plant-Specific EA2.02 Suppression pool level | 3.8 3.9 | 2 |
| 295030 Low Suppression Pool Water Level / 5 | | | | X | | | EA1.02 RCIC: Plant-Specific | 3.6 | 1 |
| 295031 Reactor Low Water Level / 2 | X | | | | X | | EK1.01 Adequate core cooling EA2.02 Reactor power | 4.7 4.2 | 2 |
| 295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1 | | | | | | | | | |
| 295038 High Off-site Release Rate / 9 | | | X | | | | EK3.02 System isolations | 4.2 | 1 |
| 500000 High Containment Hydrogen Conc. / 5 | | X | | X | | | EK2.06 Wetwell spray system EA1.01 Primary containment hydrogen instrumentation | 3.4 3.3 | 2 |
| K/A Category Totals: | 4 | 4 | 5 | 4 | 5 | 4 | Group Point Total: | | 26 |

ES-401 BWR SRO Examination OutlineForm ES-401-1 (R8, S1)
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) | Imp. | Points |
|---|--------|--------|--------|--------|--------|---|---|------------|--------|
| 295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4 | | | X | | | | AK3.02 Reactor power response | 3.8 | 1 |
| 295002 Loss of Main Condenser Vacuum / 3 | | | | | | | | | |
| 295004 Partial or Total Loss of DC Pwr / 6 | X | | | | | | AK1.06 Loss of breaker protection | 3.4 | 1 |
| 295006 Main Turbine Generator Trip / 3 | | | | X | | | AA1.01 Recirculation system: Plant-Specific | 3.3 | 1 |
| 295008 High Reactor Water Level / 2 | | | | | | | | | |
| 295012 High Drywell Temperature / 5 | | | | | X | | AA2.01 Drywell temperature | 3.9 | 1 |
| 295018 Partial or Total Loss of CCW / 8 | | X | X | | | | AK2.01 System loads AK3.06 Increasing cooling water flow to heat exchangers | 3.4 3.3 | 2 |
| 295019 Partial or Total Loss of Inst. Air / 8 | | | | X | | X | AA1.02 Instrument air system valves: Plant-Specific 2.4.6 Knowledge of symptom based EOP mitigation strategies | 3.1 4.0 | 2 |
| 295020 Inadvertent Cont. Isolation / 5 & 7 | X | X | | | | | AK1.04 Bottom head thermal stratification AK2.06 HPCI: Plant-Specific | 2.8 3.8 | 2 |
| 295021 Loss of Shutdown Cooling / 4 | | | | | | X | 2.1.32 Ability to explain and apply system limits and precautions | 3.8 | 1 |
| 295022 Loss of CRD Pumps / 1 | | | | | | | | | |
| 295028 High Drywell Temperature / 5 | | X | | | | | EK2.02 Components internal to the drywell | 3.3 | 1 |
| 295029 High Suppression Pool Water Level / 5 | | | | | | X | 2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits | 3.7 | 1 |
| 295032 High Secondary Containment Area Temperature / 5 | | | | | | | | | |
| 295033 High Secondary Containment Area Radiation Levels / 9 | | | | | | | | | |
| 295034 Secondary Containment Ventilation High Radiation / 9 | | | | | X | | EA2.02 Cause of high radiation levels | 4.2 | 1 |
| 295035 Secondary Containment High Differential Pressure / 5 | X | | | X | | | EK1.01 Secondary containment integrity EA1.02 SBTG/FRVS | 4.2 3.8 | 2 |
| 295036 Secondary Containment High Sump/Area Water Level / 5 | | | | | X | | EA2.01 Operability of components in the area | 3.2 | 1 |
| 600000 Plant Fire On Site / 8 | | | | | | | | | |
| K/A Category Point Totals: | 3 | 3 | 2 | 3 | 3 | 3 | Group Point Total: | | 17 |

Plant Systems - Tier 2/Group 1

[illegible]

| | | | | | | | | | | | | | | |
|----------------------------|---|---|---|---|---|---|---|---|---|---|---|---|------------|----|
| 290001 Secondary CTMT | X | | | | | X | | | | | | K1.07 Turbine building ventilation (steam tunnel): Plant-Specific K6.01 Reactor building ventilation: Plant-Specific | 3.1 3.6 | 2 |
| K/A Category Point Totals: | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | Group Point Total: | | 23 |

ES-401BWR SRO Examination Outline Form ES-401-1 (R8, S1)

Plant Systems - Tier 2/Group 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) | Imp. | Points |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|------------|--------|
| 201001 CRD Hydraulic | | | | | | | | | | | | | | |
| 201002 RMCS | | | | | | | | | | | | | | |
| 201004 RSCS | | | | | | X | | | | | | K6.02 Rod direction information | 3.2 | 1 |
| 201006 RWM | | | | | | | | | | | | | | |
| 202001 Recirculation | | | | | | | | | X | | | A3.07 Pump trips: Plant-Specific | 3.3 | 1 |
| 204000 RWCU | | | | | | | | | | | | | | |
| 205000 Shutdown Cooling | | | | | | | | | | | | | | |
| 214000 RPIS | | | | | | | | | | | | | | |
| 215002 RBM | | | X | | | | | | | | | K3.01 Reactor manual control system | 3.5 | 1 |
| 215003 IRM | | | | | | | | | | | | | | |
| 219000 RHR/LPCI: Torus/Pool Cooling Mode | | | | | | | | | | | | | | |
| 230000 RHR/LPCI: Torus/Pool Spray Mode | | | | X | | | | | | | | K4.07 Prevention of water hammer | 3.2 | 1 |
| 234000 Fuel Handling Equipment | | | | | | | X | | | | | A1.03 Core reactivity level | 3.9 | 1 |
| 245000 Main Turbine Gen. and Auxiliaries | | | | | | X | | | | | | K6.01 Gland seal | 2.9 | 1 |
| 269001 Reactor Feedwater | | | | | | | | | | | | | | |
| 262002 UPS (AC/DC) | | | | | | | | | | X | | A4.01 Transfer from alternate source to preferred source | 3.1 | 1 |
| 263000 DC Electrical Distribution | | | | | | | | X | | | | A2.01 Grounds | 3.2 | 1 |
| 271000 Offgas | X | | | | | | | | | | X | K1.02 Process radiation monitoring 2.4.6 Knowledge symptom based EOP mitigation strategies | 3.3 4.0 | 2 |
| 272000 Radiation Monitoring | | | | | | | | | | | X | 2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies | 3.6 | 1 |
| 286000 Fire Protection | | | | | | | | | | | | | | |
| 290003 Control Room HVAC | | | | | X | | | | | | | K5.01 Airborne contamination (eg. Radiological, toxic gas, smoke) control | 3.5 | 1 |
| 300000 Instrument Air | | | | | | | | | | | | | | |
| 400000 Component Cooling Water | | X | | | | | | | | | | K2.02 CCW valves | 2.9 | 1 |
| K/A Category Point Totals: | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | Group Point Total: | | 13 |

ES-401BWR SRO Examination OutlineForm ES-401-1 (R8, S1)

Plant Systems - Tier 2/Group 3

| System # / Name | K 1 | K 2 | K 3 | K 4 | K 6 | K6 | A1 | A2 | A3 | A4 | G | K/A Topic(s) | Imp. | Points |
|--|--------|--------|--------|--------|--------|----|----|----|----|----|---|---|------------|--------|
| 201003 Control Rod and Drive Mechanism | | | | | | | | | | | | | | |
| 215001 Traversing In-core Probe | | | | | | | | | | | X | 2.4.49 Ability to perform without reference to procedure those actions that require immediate operation of system components and controls | 4.0 | 1 |
| 233000 Fuel Pool Cooling and Cleanup | | | X | | | | | | | | | K3.06 Fuel pool water fission product concentration | 2.8 | 1 |
| 239001 Main and Reheat Steam | | | | | | | | | | | | | | |
| 256000 Reactor Condensate | | | | | X | | | X | | | | K6.03 Heat exchanger level operation A2.09 Low feedwater heater level | 2.7 2.8 | 2 |
| 268000 Radwaste | | | | | | | | | | | | | | |
| 288000 Plant Ventilation | | | | | | | | | | | | | | |
| 290002 Reactor Vessel Internals | | | | | | | | | | | | | | |
| K/A Category Point Totals: | | | | | | | | | | | | Group Point Total: | | 4 |

Plant-Specific Priorities

| System / Topic | Recommended Replacement for... | Reason | Points |
|--|--------------------------------|--------------------------|--------|
| 217000 Reactor Core Isolation Cooling System-A2.04 AC power loss | | SBO high on PRA for SSES | 1 |
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| Plant-Specific Priority Total (limit 10): | | | 1 |

| Facility: SSES | | Date of Exam: 08/12/02 | | | | | | Exam Level: RO | | | | | |
|--|-------------|------------------------|-----|-----|-----|-----|-------|----------------|-------|-------|-----|-----|-------------|
| Tier | Group | K/A Category Points | | | | | | | | | | | Point Total |
| | | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G * | |
| 1. Emergency & Abnormal Plant Evolutions | 1 | 3 | 3 | 3 | | | | 4 | 0 | | | 0 | 13 |
| | 2 | 3 | 4 | 4 | | | | 3 | 3 | | | 2 | 19 |
| | 3 | 1 | 1 | 0 | | | | 1 | 1 | | | 0 | 4 |
| | Tier Totals | 7 | 8 | 7 | | | | 8 | 4 | | | 2 | 36 |
| 2. Plant Systems | 1 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 28 |
| | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 0 | 2 | 1 | 2 | 0 | 19 |
| | 3 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 4 |
| | Tier Totals | 6 | 5 | 6 | 4 | 5 | 5 | 4 | 5 | 4 | 5 | 2 | 51 |
| 3. Generic Knowledge and Abilities | | | | | | | Cat 1 | Cat 2 | Cat 3 | Cat 4 | 13 | | |
| | | | | | | | 3 | 3 | 3 | 4 | | | |
| <p>Note:</p> <ol style="list-style-type: none"> Ensure that at least two topics from every K/A category are sampled within each tier (i.e., 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 exam must total 100 points. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities. Systems/evolutions within each group are identified on the associated outline. The shaded areas are not applicable to the category/tier. * The generic 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. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above. | | | | | | | | | | | | | |

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)
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) | Imp. | Points |
|--|----------|----------|----------|----------|----------|----------|---|------|-----------|
| 295005 Main Turbine Generator Trip / 3 | | | | X | | | AA1.01 Recirculation system: Plant-Specific | 3.1 | 1 |
| 295006 SCRAM / 1 | X | | | X | | | AK1.03 Reactivity control | 3.7 | 2 |
| | | | | | | | AA1.04 Recirculation system | 3.1 | |
| 295007 High Reactor Pressure / 3 | | X | X | | | | AK2.02 Reactor power | 3.8 | 2 |
| | | | | | | | AK3.06 Reactor/turbine pressure regulating system operation | 3.7 | |
| 295009 Low Reactor Water Level / 2 | | | | | | | | | |
| 295010 High Drywell Pressure / 5 | | X | | X | | | AK2.01 Suppression pool level | 3.2 | 2 |
| | | | | | | | AA1.02 Drywell floor and equipment drain sumps | 3.6 | |
| 295014 Inadvertent Reactivity Addition / 1 | | | X | | | | AK3.02 Control rod blocks | 3.7 | 1 |
| 295015 Incomplete SCRAM / 1 | | | | | | | | | |
| 295024 High Drywell Pressure / 5 | X | | X | | | | EK1.01 Drywell integrity: Plant-Specific | 4.1 | 2 |
| | | | | | | | EK3.09 Auxiliary Building isolation: Plant-Specific | 3.1 | |
| 295025 High Reactor Pressure / 3 | | | | | | | | | |
| 295031 Reactor Low Water Level / 2 | X | | | | | | EK1.01 Adequate core cooling | 4.6 | 1 |
| 295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1 | | | | | | | | | |
| 500000 High Containment Hydrogen Conc. / 5 | | X | | X | | | EK2.06 Wetwell spray system | 3.0 | 2 |
| | | | | | | | EA1.01 Primary containment hydrogen instrumentation | 3.4 | |
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| | | | | | | | | | |
| K/A Category Totals: | 3 | 3 | 3 | 4 | 0 | 0 | Group Point Total: | | 13 |

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)
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) | Imp. | Points |
|---|--------|--------|--------|--------|--------|---|--|------------|--------|
| 295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4 | | | X | | | | AK3.02 Reactor power response | 3.7 | 1 |
| 295002 Loss of Main Condenser Vacuum / 3 | | | | | | | | | |
| 295003 Partial or Complete Loss of AC Pwr / 6 | | X | | | | | AK2.01 Station batteries | 3.2 | 1 |
| 295004 Partial or Complete Loss of DC Pwr / 6 | X | | | | | | AK1.05 Loss of breaker protection | 3.3 | 1 |
| 295008 High Reactor Water Level / 2 | | | | | | | | | |
| 295012 High Drywell Temperature / 5 | | | | | | | | | |
| 295013 High Suppression Pool Temp. / 5 | | | | | | X | 2.4.31 Knowledge of annunciators alarms and indications, and use of the response instructions | 3.3 | 1 |
| 295016 Control Room Abandonment / 7 | | | | | X | X | AA2.04 Suppression pool temperature 2.4.6 Knowledge symptom based EOP mitigation strategies | 3.9 3.1 | 2 |
| 295017 High Off-site Release Rate / 9 | X | | | X | | | AK1.02 Protection of the general public AA1.10 RPS | 3.8 3.6 | 2 |
| 295018 Partial or Complete Loss of CCW / 8 | | X | X | | | | AK2.01 System loads AK3.06 Increasing cooling water flow to heat exchangers | 3.3 3.3 | 2 |
| 295019 Part. or Comp. Loss of Inst. Air / 8 | | | | X | | | AA1.02 Instrument air system valves: Plant-Specific | 3.3 | 1 |
| 295020 Inadvertent Cont. Isolation / 5 & 7 | X | X | | | | | AK1.04 Bottom head thermal stratification AK2.06 HPCI: Plant-Specific | 2.5 3.8 | 2 |
| 295022 Loss of CRD Pumps / 1 | | | | | | | | | |
| 295026 High Suppression Pool Water Temp. / 5 | | | X | | X | | EK3.03 Suppression pool spray: Plant-Specific EA2.02 Suppression pool level | 3.5 3.8 | 2 |
| 295028 High Drywell Temperature / 5 | | X | | | X | | EK2.02 Components internal to the drywell EA2.05 Torus/suppression chamber pressure: Plant-Specific | 3.2 3.6 | 2 |
| 295029 High Suppression Pool Water Level / 5 | | | | | | | | | |
| 295030 Low Suppression Pool Water Level / 5 | | | | X | | | EA1.02 RCIC: Plant-Specific | 3.4 | 1 |
| 295033 High Sec. Cont. Area Rad. Levels / 9 | | | | | | | | | |
| 295034 Sec. Cont. Ventilation High Rad. / 9 | | | | | | | | | |
| 295038 High Off-site Release Rate / 9 | | | X | | | | EK3.02 System isolations | 3.9 | 1 |
| 600000 Plant Fire On Site / 8 | | | | | | | | | |
| K/A Category Point Totals: | 3 | 4 | 4 | 3 | 3 | 2 | Group Point Total: | | 19 |

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | Imp. | Points |
|---|----------|----------|----------|----------|----------|----------|--|------------|----------|
| 295021 Loss of Shutdown Cooling / 4 | | X | | | | | AK2.07 Reactor recirculation | 3.1 | 1 |
| 295023 Refueling Accidents / 8 | | | | | X | | AA2.01 Area radiation levels | 3.6 | 1 |
| 295032 High Secondary Containment Area Temperature / 5 | | | | | | | | | |
| 295035 Secondary Containment High Differential Pressure / 5 | X | | | X | | | EK1.01 Secondary containment integrity EA1.02 SBTG/FRVS | 3.9 3.6 | 2 |
| 295036 Secondary Containment High Sump/Area Water Level / 5 | | | | | | | | | |
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| K/A Category Point Totals: | 1 | 1 | 0 | 1 | 1 | 0 | Group Point Total: | | 4 |

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)

Plant Systems - Tier 2/Group 1

| System # / Name | K 1 | K 2 | K 3 | K 4 | K 6 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | Imp. | Points |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|--|------------|--------|
| 201001 CRD Hydraulic | | | | | | | | | | | | | | |
| 201002 RMCS | | | | | | | | | | X | | A4.05 Rod select matrix | 3.1 | 1 |
| 202002 Recirculation Flow Control | | | | | | | | | X | | | A3.03 Scoop tube operation | 3.1 | 1 |
| 203000 RHR/LPCI: Injection Mode | | | | | | X | X | | | | | K6.06 Suppression pool A1.09 Component cooling water system | 3.8 2.9 | 2 |
| 206000 HPCI | | | | | | | | | X | | | A3.01 Turbine speed | 3.6 | 1 |
| 209001 LPCS | X | | | | | | | | | X | | K1.14 Reactor vessel A4.05 Manual initiation controls | 3.7 3.8 | 2 |
| 211000 SLC | | | | | | | | | | | X | 2.1.33 Ability to recognize indications and system operating parameters which are entry-level conditions for technical specifications | 3.4 | 1 |
| 212000 RPS | | | | | | | | | | | X | 2.4.4 Ability to recognize abnormal for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures | 4.0 | 1 |
| 215003 IRM | X | | | | | | | | | X | | K1.05 Display control system: Plant-Specific A4.04 IRM back panel switches, meters and indicating lights | 3.3 3.1 | 2 |
| 215004 SRM | | | | | | | | | | | | | | |
| 215005 APRM / LPRM | | | | | | | | X | | | | A2.03 Inoperative trip (all causes) | 3.6 | 1 |
| 216000 Nuclear Boiler Instrumentation | | | | | X | | | | | | | K5.10 Indicated level versus actual during vessel heatups or cooldowns | 3.1 | 1 |
| 217000 RCIC | | X | X | | | | | | | | | K2.04 Gland seal compressor (vacuum pump) K3.03 Decay heat removal | 2.6 3.5 | 2 |
| 218000 ADS | | | X | | | | X | | | | | K3.02 Ability to rapidly depressurize the reactor A1.04 Reactor pressure | 4.5 4.1 | 2 |
| 223001 Primary CTMT and Auxiliaries | | X | | X | | | | | | | | K2.09 Drywell cooling fans: Plant-Specific K4.03 Containment/drywell isolation | 2.7 3.7 | 2 |
| 223002 PCIS/Nuclear Steam Supply Shutoff | | | X | X | | | | | | | | K3.14 Recirculation system: Plant-Specific K4.03 Manual initiation capability: Plant-Specific | 3.0 3.5 | 2 |
| 239002 SRVs | X | | | | | | | X | | | | K1.06 Drywell instrument air/drywell pneumatics: Plant-Specific A2.02 Leaky SRV | 3.4 3.1 | 2 |
| 241000 Reactor/Turbine Pressure Regulator | | | | | X | X | | | | | | K5.03 Reactor power vs. reactor pressure K6.02 DC electrical power | 3.5 2.6 | 2 |

| | | | | | | | | | | | | | | | |
|------------------------------------|---|---|---|---|---|---|---|---|---|---|---|--------------------|---|------------|----|
| 259001 Reactor Feedwater | | | | | | | | | | | | | | | |
| 259002 Reactor Water Level Control | | | | | X | | X | | | | | | K5.03 Water level measurement A1.02 Reactor feedwater flow | 3.1 3.6 | 2 |
| 261000 SGTS | | | | | | | | X | | | | | A2.13 High secondary exhaust radiation | 3.4 | 1 |
| 264000 EDGs | | | | | | | | | | | | | | | |
| K/A Category Point Totals: | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | Group Point Total: | | | 28 |

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)
Plant Systems - Tier 2/Group 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) | Imp. | Points |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|------------|--------|
| 201003 Control Rod and Drive Mechanism | | | | | | | | | | | | | | |
| 201004 RSCS | | | | | | X | | | | | | K6.02 Rod direction information | 3.1 | 1 |
| 201006 RWM | | | | | | | | | | | | | | |
| 202001 Recirculation | | | | | | | | | X | | | A3.07 Pump trips: Plant-Specific | 3.3 | 1 |
| 204000 RWCU | | | | | | | | | | | | | | |
| 205000 Shutdown Cooling | | | | | | | | | | | | | | |
| 214000 RPIS | | | | | | | | | | | | | | |
| 215002 RBM | | | X | | | | | | | | | K3.01 Reactor manual control system | 3.3 | 1 |
| 219000 RHR/LPCI: Torus/Pool Cooling Mode | | | | | | | | | | | | | | |
| 226001 RHR/LPCI: CTMT Spray Mode | | | | | | | | | | X | | A4.09 Pump discharge pressure | 2.8 | 1 |
| 230000 RHR/LPCI: Torus/Pool Spray Mode | | X | | X | | | | | | | | K2.02 Pumps K4.07 Prevention of water hammer | 2.8 3.1 | 2 |
| 239001 Main and Reheat Steam | | | | | | | | | | | | | | |
| 245000 Main Turbine Gen. and Auxiliaries | | | | | | X | | | | | | K6.01 Gland seal | 2.8 | 1 |
| 256000 Reactor Condensate | | | | | X | | | X | | | | K5.03 Heat exchanger level operation A2.09 Low feedwater heater level | 2.6 2.8 | 2 |
| 262001 AC Electrical Distribution | X | | X | | | | | | | | | K1.01 Emergency generators K3.02 Emergency generators | 3.8 3.8 | 2 |
| 262002 UPS (AC/DC) | | | | | | | | | | X | | A4.01 Transfer from alternate source to preferred source | 2.8 | 1 |
| 263000 DC Electrical Distribution | | | | | | | | X | | | | A2.01 Grounds | 2.8 | 1 |
| 271000 Offgas | X | | | | | | | | | | | K1.02 Process radiation monitoring | 3.1 | 1 |
| 272000 Radiation Monitoring | | | | | | | | | | | | | | |
| 286000 Fire Protection | | | | | | | | | | | | | | |
| 290001 Secondary CTMT | X | | | | | X | | | | | | K1.07 Turbine building ventilation (steam tunnel): Plant-Specific K6.01 Reactor building ventilation: Plant-Specific | 3.0 3.5 | 2 |
| 290003 Control Room HVAC | | | | | X | | | | | | | K5.01 Airborne contamination (e.g. radiological, toxic gas, smoke) control | 3.2 | 1 |
| 300000 Instrument Air | | | | | | | | | | | | | | |
| 400000 Component Cooling Water | | X | | X | | | | | | | | K2.02 CCW valves K4.01 Automatic start of standby pump | 2.9 3.4 | 2 |
| K/A Category Point Totals: | 3 | 2 | 2 | 2 | 2 | 3 | 0 | 2 | 1 | 2 | 0 | Group Point Total: | | 19 |

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)

Plant Systems - Tier 2/Group 3

| 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) | Imp. | Points |
|--------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|--|------------|--------|
| 215001 Traversing In-core Probe | | | | | | | | | X | | | A3.03 Valve operation | 2.5 | 1 |
| 233000 Fuel Pool Cooling and Cleanup | | X | X | | | | | | | | | K2.02 RHR pumps K3.05 Fuel pool water fission product concentration | 2.8 2.6 | 2 |
| 234000 Fuel Handling Equipment | | | | | | | X | | | | | A1.03 Core reactivity level | 3.4 | 1 |
| 239003 MSIV Leakage Control | | | | | | | | | | | | | | |
| 268000 Radwaste | | | | | | | | | | | | | | |
| 288000 Plant Ventilation | | | | | | | | | | | | | | |
| 290002 Reactor Vessel Internals | | | | | | | | | | | | | | |
| K/A Category Point Totals: | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | Group Point Total: | | 4 |

Plant-Specific Priorities

| System / Topic | Recommended Replacement for... | Reason | Points |
|--|-----------------------------------|--------------------------|--------|
| 217000 Reactor Core Isolation Cooling System-A2.04 AC power loss | | SBO high on PRA for SSES | 1 |
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| | | | |
| Plant-Specific Priority Total: (limit 10) | | | 1 |

| Facility: SSES | | Date of Exam: 08/12/02 | | Exam Level: SRO | |
|-----------------------|--------|--|------|-----------------|---|
| Category | K/A # | Topic | Imp. | Points | |
| Conduct of Operations | 2.1.11 | Knowledge of less than one hour technical specification action statements for systems | 3.8 | 1 | |
| | 2.1.13 | Knowledge of facility requirements for controlling vital/controlled access | 2.9 | 1 | |
| | 2.1.28 | Knowledge of the purpose and function of major system components and controls | 3.3 | 1 | |
| | 2.1.23 | Ability to perform specific system and integrated plant procedures during different modes of plant operation | 4.0 | 1 | |
| | Total | | | | 4 |
| Equipment Control | 2.2.3 | (multi-unit) Knowledge of the design/procedural/and operational; differences between units | 3.3 | 1 | |
| | 2.2.19 | Knowledge of maintenance work order requirements | 3.1 | 1 | |
| | 2.2.24 | Ability to analyze the affect of maintenance on LCO status | 3.8 | 1 | |
| | 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 | 3.3 | 1 | |
| | Total | | | | 4 |
| Radiation Control | 2.3.3 | Knowledge of SRO responsibilities for auxiliary systems that are outside the control room (eg. Waste disposal and handling systems) | 2.9 | 1 | |
| | 2.3.1 | Knowledge of 10CFR: 20 and related facility radiation control requirements | 3.0 | 1 | |
| | 2.3.11 | Ability to control radiation releases | 3.2 | 1 | |
| | 2.3.9 | Knowledge of the process for performing a containment purge | 3.4 | 1 | |
| | Total | | | | 4 |

| | | | | |
|-------------------------------|--------|---|-----|-------|
| Emergency Procedures/ Plan | 2.4.1 | Knowledge of EOP entry conditions and immediate action steps | 4.6 | 1 |
| | 2.4.16 | Knowledge of EOP implementation hierarchy and coordination with other support procedures | 4.0 | 1 |
| | 2.4.21 | Knowledge of the parameters and logic used to assess the status of safety functions including: | 4.3 | 1 |
| | 2.4.47 | Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material | 3.7 | 1 |
| | 2.4.27 | Knowledge of fire in the plant procedures | 3.5 | 1 |
| | Total | | | 5 |
| Tier 3 Point Total (RO/SRO) | | | | 13/17 |

| Facility: SSES | | Date of Exam: 08/12/02 | Exam Level: RO | |
|-----------------------------|--------|--|----------------|--------|
| Category | K/A # | Topic | Imp. | Points |
| Conduct of Operations | 2.1.28 | Knowledge of the purpose and function of major system components and controls | 3.2 | 1 |
| | 2.1.23 | Ability to perform specific system and integrated plant procedures during different modes of plant operation | 3.9 | 1 |
| | 2.1.16 | Ability to operate plant phone/paging system/and two-way radio | 2.9 | 1 |
| | Total | | | 3 |
| Equipment Control | 2.2.24 | Ability to analyze the affect of maintenance on LCO status | 2.6 | 1 |
| | 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 |
| | 2.2.22 | Knowledge of limiting conditions for operations and safety limits | 3.4 | 1 |
| | Total | | | 3 |
| Radiation Control | 2.3.11 | Ability to control radiation releases | 2.7 | 1 |
| | 2.3.9 | Knowledge of the process for performing a containment purge | 2.5 | 1 |
| | 2.3.2 | Knowledge of facility ALARA program | 2.5 | 1 |
| | Total | | | 3 |
| Emergency Procedures/ Plan | 2.4.16 | Knowledge of EOP implementation hierarchy and coordination with other support procedures | 3.0 | 1 |
| | 2.4.21 | Knowledge of the parameters and logic used to assess the status of safety functions including: | 3.7 | 1 |
| | 2.4.47 | Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material | 3.4 | 1 |
| | 2.4.27 | Knowledge of fire in the plant procedures | 2.9 | 1 |
| | Total | | | 4 |
| Tier 3 Point Total (RO/SRO) | | | | 13/17 |

Facility: SSESDate of Examination: 08/12/02Examination Level (circle one): RO **SRO**Operating Test Number: A-SRO

| Administrative Topic/Subject Description | | Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions |
|--|-------------------|--|
| A.1 | CONDUCT OF OPS | Requirements to maintain license-2.1.1 (3.8) |
| | | Discovery of mispositioned control rod-2.1.20 (4.2) |
| | | Action when less than required staffing at shift turnover-2.1.4 (3.4) |
| | | Working hour restrictions-2.1.1 (3.8) |
| A.2 | EQUIPMENT CONTROL | JPM – Review failed surveillance test and determine action-2.2.24 (3.8) |
| | | — |
| A.3 | RADIATION CONTROL | Authorizing exceeding station/NRC limits-2.3.4 (3.1) |
| | | Actions for Locked High Rad door found open on tour-2.3.10 (3.3) |
| A.4 | EMERGENCY PLAN | JPM – Fill out classification paperwork-2.4.40 (4.0) |
| | | — |

| | | |
|---|-------------------|--|
| Facility: <u>SSES</u> | | Date of Examination: <u>08/12/02</u> |
| Examination Level (circle one): <u>RO</u> SRO | | Operating Test Number: <u>A-RO</u> |
| Administrative Topic/Subject Description | | Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions |
| A.1 | CONDUCT OF OPS | Requirements to maintain license-2.1.1 (3.7) |
| | | Discovery of mispositioned control rod-2.1.20 (4.3) |
| | | Requirements for temporary relief-2.1.3 (3.0) |
| | | Requirements for temp mod of procedure-2.1.21 (3.1) |
| A.2 | EQUIPMENT CONTROL | JPM – Review failed surveillance test and determine action-2.2.24 (2.6) |
| | | — |
| A.3 | RADIATION CONTROL | Stay time limits-2.3.1 (2.6) |
| | | Requirements for High Rad entry-2.3.10 (2.9) |
| A.4 | EMERGENCY PLAN | Action if an ALERT is announced while in RB performing a task-2.4.39 (3.3) |
| | | Notification Requirements for an ALERT Declaration-2.4.43 (2.8) |

and Facility Walk-Through Test Outline

| Facility: <u>SSES</u> | | Date of Examination: <u>08/12/02</u> |
|---|------------|--------------------------------------|
| Exam Level (circle one): RO <u>SRO(I)</u> SRO(U) | | Operating Test No.: <u>B-SRO-I</u> |
| B.1 Control Room Systems | | |
| System / JPM Title | Type Code* | Safety Function |
| a. 239001 - Equalize and Reopen MSIVs ON-184-001 | N,S | 3 |
| b. 259002 - Respond to a Failure of "A" RFPT SPD/CTL/DEMAND Signal ON-145-001 | M,S,A | 2 |
| c. 215004 - Respond to an SRM Failure Alarm Response | N,S,L | 7 |
| d. 209001 - Manually Initiate Core Spray with Initiation Logic Failure OP-151-001 | M,S,A | 2 |
| e. 223002 - Bypass MSIV/CIG interlocks with CIG Isolation Occurring OP-184-001 | M,S,A | 8 |
| f. 211000 - Initiate Standby Liquid Control with RWCU Valve Failure to Isolate OP-153-001 | D,S,A | 1 |
| g. 206000 - HPCI Recovery from Isolation Valve Closure with Initiation Signal Present and a Steam Leak Developing OP-152-001 | D,S,A | 2 |
| B.2 Facility Walk-Through | | |
| a. 230000 - Line up Unit 2 Suppression Chamber Spray using Fire Protection Water without Electrical Power Available ES-013-001 | M,R | 5 |
| b. 262002 - Place Vital AC UPS in Service OP-157-001 | D | 6 |
| c. 223001 - Start a Unit 2 Hydrogen Recombiner OP-273-001 | M | 5 |
| * Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA | | |

ES-301

Control Room Systems
and Facility Walk-Through Test Outline

Form ES-301-2 (R8, S1)

| Facility: <u>SSES</u> | | Date of Examination: <u>08/12/02</u> |
|---|------------|--------------------------------------|
| Exam Level (circle one): RO / SRO(I) SRO(U) | | Operating Test No.: <u>B-SRO-U</u> |
| B.1 Control Room Systems | | |
| System / JPM Title | Type Code* | Safety Function |
| a. 239001 - Equalize and Reopen MSIVs ON-184-001 | N,S | 3 |
| b. | | |
| c. | | |
| d. 209001 - Manually Initiate Core Spray with Initiation Logic Failure OP-151-001 | M,S,A | 2 |
| e. | | |
| f. 211000 - Initiate Standby Liquid Control with RWCU Valve Failure to Isolate OP-153-001 | D,S,A | 1 |
| g. | | |
| B.2 Facility Walk-Through | | |
| a. 230000 - Line up Unit 2 Suppression Chamber Spray using Fire Protection Water without Electrical Power Available ES-013-001 | M,R | 5 |
| b. 262002 - Place Vital AC UPS in Service OP-157-001 | D | 6 |
| c. | | |
| * Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA | | |

and Facility Walk-Through Test Outline

| Facility: <u>SSES</u> | | Date of Examination: <u>08/12/02</u> |
|---|------------|--------------------------------------|
| Exam Level (circle one) RO SRO(I) / SRO(U) | | Operating Test No.: <u>B-RO</u> |
| B.1 Control Room Systems | | |
| System / JPM Title | Type Code* | Safety Function |
| a. 239001 - Equalize and Reopen MSIVs ON-184-001 | N,S | 3 |
| b. 259002 - Respond to a Failure of "A" RFPT SPD/CTL/DEMAND Signal ON-145-001 | M,S,A | 2 |
| c. 215004 - Respond to an SRM Failure Alarm Response | N,S,L | 7 |
| d. 209001 - Manually Initiate Core Spray with Initiation Logic Failure OP-151-001 | M,S,A | 2 |
| e. 223002 - Bypass MSIV/CIG interlocks with CIG Isolation Occurring OP-184-001 | M,S,A | 8 |
| f. 211000 - Initiate Standby Liquid Control with RWC Valve Failure to Isolate OP-153-001 | D,S,A | 1 |
| g. 206000 - HPCI Recovery from Isolation Valve Closure with Initiation Signal Present and a Steam Leak Developing OP-152-001 | D,S,A | 2 |
| B.2 Facility Walk-Through | | |
| a. 230000 - Line up Unit 2 Suppression Chamber Spray using Fire Protection Water without Electrical Power Available ES-013-001 | M,R | 5 |
| b. 262002 - Place Vital AC UPS in Service OP-157-001 | D | 6 |
| c. 223001 - Start a Unit 2 Hydrogen Recombiner OP-273-001 | M | 5 |
| * Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA | | |

Facility: SSES Scenario No.: 1 Op-Test No.: C1

Examiners: _____ Operators: US - #2/ #4/ #6
 _____ PCOM - #1/ #3/ #5
 _____ PCOP - #9/#10/#11

Initial Conditions: 100% Rated Power

B Emergency Diesel Generator was started and synchronized to the bus for
surveillance testing 4 hours ago, RCIC Out Of Service due to oil system
contamination.

Turnover: Shutdown the B Emergency Diesel Generator
Continue normal operations

| Event No. | Malfunction No. | Event Type* | Event Description |
|-----------|-----------------|-------------|---|
| 1 | | N | Unload and secure B EDG |
| 2 | BR03 | I | EDG B output breaker trips on overcurrent |
| 3 | RP158008A | C | Trip of RPS A MG Set motor |
| 4 | RD155008 | C | Control rod scrams when RPS A de-energizes (fuse) |
| 5 | RD155006 | C | Control rod sticks at position 10 |
| 6 | | R | 20% Power reduction due stuck rod |
| 7 | RR164010 | | Small Leak in Drywell |
| 8 | | C | HPCI auto Start Failure |
| 9 | MS183007 | M | A MSL leak inside drywell |
| 10 | MV07 | C | DW Spray Valve F021 Fail to Open |

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

Facility: SSES Scenario No.: 2 Op-Test No.: C1

Examiners: _____ Operators: US - #1/ #3/ #5
 _____ PCOM - #7/ #10/ #11
 _____ PCOP - #2/ #4/ #6

Initial Conditions: 100% Rated Power
High Pressure Coolant Injection is Inoperable due to a failed governor valve

Turnover: Swap operating CRD pumps

| Event No. | Malfunction No. | Event Type* | Event Description |
|-----------|------------------|-------------|---|
| 1 | | N | Secure A CRD pump and Start B CRD pump |
| 2 | | R | Power Control requests power drop of 100 MWe |
| 3 | FW145009A | C | Trip of RFPT A |
| 4 | NM178012D | I | Recirc flow Unit failure downscale |
| 5 | PM03 RD155019 | C | Loss of CRD Flow / INOP Accumulator |
| 6 | RP158003 | M | Failure to scram-RPS relays fail to de-energize |
| 7 | PM03 | C | SLC System Failure |
| 8 | TC193001 | C | Main turbine trip |
| 9 | RC150002 | I | RCIC Speed Controller Failure |
| 10 | BR05 | C | Loss of Aux bus 11A/B |
| | | | |
| | | | |
| | | | |
| | | | |

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

Facility: SSES Scenario No.: 3 Op-Test No.: C1

Examiners: _____ Operators: : US - #7/ #X/ #8
 _____ PCOM - #9/ #4/ #6
 _____ PCOP - #1/ #3/ #5

Initial Conditions: 50% Rated Power

Standby Liquid pump 1B is Inoperable while Maintenance investigates a high motor vibration

Turnover: Transfer SUB 10 to SUT 10 then continue power ascension

| Event No. | Malf. No. | Event Type* | Event Description |
|-----------|---------------------|-------------|--|
| 1 | | N | Transfer SUB 10 to SUT 10 |
| 2 | | R | Continue power ascension to raise power |
| 3 | TR02 | I | B Feedwater Flow Transmitter Fails Low |
| 4 | TH02 | I | Inadvertent HPCI Isolation Due to Failed Room Temperature Instrument |
| 5 | IA118002 | C | Loss of Instrument Air |
| 6 | RR164011A 0-40% | M | Recirc loop B suction Rupture DBA |
| 7 | RL01 | C | AUTO ADS Logic Failure |
| 8 | MV06:HV15 1F015B | C | Loop B RHR Injection Valve Fails to Open |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

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

Facility: SSES Scenario No.: 4 Op-Test No.: C1

Examiners: _____ Operators: : US - #8
 _____ PCOM - #2
 _____ PCOP - #7

Initial Conditions: 90% Rated Power
B EHC pump is OOS for breaker maintenance
RHR Loop A has just been secured from Suppression Pool Cooling and RHRSW pump
1A is running for vibration data

Turnover: Secure RHRSW pump 1A once data has been taken

| Event No. | Malf. No. | Event Type* | Event Description |
|-----------|--------------|-------------|--|
| 1 | | N | Secure RHRSW Pump 1A |
| 2 | TR02 | I | RHRSW Radiation Monitor Fails Upscale |
| 3 | PM03 | C | Loss of Isolate Bus Duct Cooling |
| 4 | | R | Power reduction to lower generator current to <19,000 amps |
| 5 | EG198004 | C | Generator Lockout/Turbine Trip |
| 6 | RP158007 B | M | RPS B Failure to Trip - ATWS |
| 7 | SL153001 A/B | C | SLC Squibb Valves Fail |
| 8 | PM03 | C | B EHC Pump Trip |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

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

Facility: SSES Scenario No.: 5 (SPARE) Op-Test No.: C1

Examiners: _____ Operators: SRO-I /SRO-U
 _____ SRO-I
 _____ RO

Initial Conditions: 100% Rated Power

B CRD pump is OOS for breaker maintenance

1B Condensate pump has possible ground

Turnover: Reduce power and shutdown 1B Condensate pump

| Event No. | Malf. No. | Event Type* | Event Description |
|-----------|---------------|-------------|---|
| 1 | | R | Reduce reactor power for pump removal |
| 2 | | N | Secure 1B Condensate pump |
| 3 | | I | "A" Narrow Range level instrument fails upscale |
| 4 | RR179003 | C | Fuel clad failure ramped |
| 5 | RP158007 A | I | Failure of a RPS to trip – Half scram failure |
| 6 | MS183008 | M | MSL leak Inside Turbine Building |
| 7 | | C | "D" MSL failure to isolate – stem binding |
| | | | |
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| | | | |
| | | | |
| | | | |

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

February 4, 2002

Mr. Alan Blamey
USNRC Chief Examiner
US NRC Region 1
475 Allendale Road
King of Prussia, PA 19406-1415



Susquehanna Learning Center
Bases for Suppression of K/As
For the SSES NRC Examination
PLA 005439 PLI A14-13

Dear Alan:

Per our discussion on January 28, 2002, SSES has reviewed your comments regarding suppression of K/As in NUREG 1123, Rev. 2, and in documentation on Form ES-401-10, Record of Rejected K/As. As you are aware, this discussion was a follow-up to letter PLA005433/PLI A14-13 from Jeff Helsel (PPL) dated January 17, 2002. That letter provided a markup of NUREG-1123 indicating all K/A's that SSES proposed to suppress for future NRC examinations. Our discussion on January 28, 2002, indicated general acceptance of the submitted markup copy of NUREG-1123 with few exceptions. Those exceptions and associated resolutions are addressed in this letter.

As discussed, generic K/As not applicable to Tier 1 and Tier 2 of the SRO/RO exam outlines will be suppressed per the NRC 'Clarification of Guidance Regarding the Elimination of Inappropriate Knowledge and Abilities (K/As) on Written Operator Licensing Examinations' letter. As per the direction provided in the referenced letter, K/A 2.4.30 will not be suppressed. However, it should be noted that the RO outline will not select this K/A due to an importance rating less than 2.5.

As per NRC guidelines, K/As with importance ratings less than 2.5 will not be selected unless proper justification is provided. K/As with an importance rating less than 2.5 and having a '*' next to the rating were reviewed and determined to be a valid rating for SSES with one exception: K/A 217000 A2.04 (importance rating of 2.3 for RO and SRO) as described below:

- 217000 A2.04 will be **UNSUPPRESSED** due to SSES PRA identifying SBO as a core damage event. This K/A will be listed as a plant specific priority per ES-401.

The majority of the proposed items required no additional clarification beyond that provided in the initial letter. Those items that the Chief Examiner did request additional information were discussed and resolved as follows:

- 201001 A4.02 will remain **suppressed** due to SSES design not including control room control or indications for these manual valves.
- 201001 A4.05 will remain **suppressed** due to SSES design not including a cooling Water Pressure Control Valve.
- 201002 A3.04 will remain **suppressed** due to SSES design not including an alarm for this malfunction in the control room.
- 201002 A4.04 will remain **suppressed** due to SSES design not including a test switch for this malfunction in the control room.
- 202002 K4.04 will remain **suppressed** due to SSES design not including a connection to the load following circuit.
- 202001 A2.07 will be **UNSUPPRESSED** since speed can be determined on a back panel indicator and could relate to the procedure driven flow mismatch.
- 211000 K6.04/6.05 will remain **suppressed** due to this relation to RCIC for alternate boron injection being covered by 295037 EA1.10.
- 206000 K1.13 will be **UNSUPPRESSED** due to SSES design having interconnection between HPCI drains and the main condenser.

- 206000 K1.15 will be **UNSUPPRESSED** since the system drain valves are air operated, however this K/A will not be selected due to importance rating less than 2.5.
- 206000 K5.03 will remain **suppressed** due to SSES design not including GEMAC controllers, however design includes BAILEY controllers covered by 206000 K5.05.
- 209001 A4.07 will remain **suppressed** due to SSES design not including a system fill pump, instead SSES uses a connection to Condensate Transfer covered by 295031 EA1.08.
- 256000 A3.09 will remain **suppressed** due to SSES design not including indication of drain tank level or having a level control device.
- 217000 K1.08 will remain **suppressed** due to SSES design not including a system fill pump, instead SSES uses a connection to Condensate Transfer covered by 295031 EA1.08.
- 217000 A2.06 will be **UNSUPPRESSED** due to SSES design using air operated valves in the drain lines, however this K/A will not be selected due to importance rating less than 2.5.
- 218000 K1.05 will remain **suppressed** due to SSES design not including ADS logic or circuit control being provided at the Remote Shutdown Panels.
- 241000 A3.06 will be **UNSUPPRESSED** since SSES design does include a direct scram from EHC low oil pressure (via TCV fast closure).
- 241000 A3.17 will remain **suppressed** due to SSES design not including turbine runbacks, stator cooling causes a direct trip of turbine without a runback.
- 262001 K1.06 will be **UNSUPPRESSED** due to SSES design using a portable diesel to provide power.

A revised Form ES-401-10, Record of Rejected K/As, a revised markup of NUREG-1021 indicating suppressed (lined-out) items, and a listing of suppressed items are included as attachments to this letter for NRC record. Those items that are lined-out are considered not applicable to SSES design and are therefore suppressed. Items that have an importance rating less than 2.5 but are applicable to SSES design are not lined-out even though they will not be selected as an examination item (with the exception of K/A 217000 A2.04 as noted above).

If you have any questions, please feel free to call me at (570) 542-3510 or Jeff Morris at (570) 542-3678.

Sincerely,



J.M. Helsel
Supervisor Operations Instruction

Response: No

Attachment

cc: W. W. Hunt
Ops Letter File
Nuc Records – Site

jmpla005439suppressionofKAs

JDM/JMH/cae

ES-401

Record of Rejected K/As

Form ES-401-10 (R8, S1)

SUSQUEHANNA STEAM ELECTRIC STATION

| Tier / Group | Randomly Selected K/A | Reason for Rejection |
|------------------|--|---|
| Various | Line Out in Attached NUREG 1123, Rev. 2 for SSES | <p>Lineout of all K/As not applicable to SSES design per letter PLA005439 PLI A14-13 from Jeff Helsel (PPL) to Alan Blamey (NRC) dated Feb 4th, 2002. These items were rejected because the line item does not pertain to the design of the Susquehanna Steam Electric Station. Additional justification is provided for the following specific K/A line items per A. Blamey request.</p> <ol style="list-style-type: none"> 201001 A4.02 SSES design has no control room indication or control, valves are manual local. 201001 A4.05 SSES does not have a Cooling Water Press Control valve. 201002 A3.04/A4.04 SSES does not have a timer alarm or test switch in its design. 202002 K4.04 Load following circuit is disabled. 211000 K6.04 and 6.05 No connection or interrelation between CS or HPCI and SLC. RCIC covered by 295037 EA1.10. 206000 K5.03 SSES design uses Bailey controller, covered by K5.05 Turbine Speed Controller. 209001 A4.07 SSES design uses Condensate Transfer for keep fill not a separate pump. 256000 A3.09 SSES design uses cascading drain system with no drain tank level controller, drain tank flooded. 217000 K1.08 SSES design uses Condensate Transfer for keep fill not a separate pump. 218000 K1.05 SSES remote S/D panels do not effect ADS logic only individual valve control switches for 3 valves. 241000 A3.17 SSES design does not provide for turbine runback: direct turbine trip w/o runback |
| Tier1 and Tier 2 | Generic K/As | Non-system Generic K/As suppressed per NRC Suppression Guidance Letter, 'Clarification of Guidance Regarding the Elimination of Inappropriate Knowledge and Abilities (K/As) on Written Operator Licensing Examinations' |
| All | <2.5 Importance Rating | All K/A that are less than 2.5 and applicable to SSES design will not be selected for examination with exception of K/A 217000 A2.04. SSES PRA has identified SBO as a core damage event and therefore this K/A may be considered as a plant specific priority per ES-401 |
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ES-401

Record of Rejected K/As

Form ES-401-10 (R8, S1)

SUSQUEHANNA STEAM ELECTRIC STATION

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| Tier1 and Tier 2 | Generic K/As | Non-system Generic K/As suppressed per NRC Suppression Guidance Letter, 'Clarification of Guidance Regarding the Elimination of Inappropriate Knowledge and Abilities (K/As) on Written Operator Licensing Examinations' |
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SUSQUEHANNA STEAM ELECTRIC STATION

The attached list of K&As (16 pages) have been determined to be **NOT APPLICABLE** to the design of the Susquehanna Steam Electric Station and as a result, will be suppressed during the generation of NRC licensed operator examinations.

K1 - Knowledge of the physical connections and/or cause-effect relationships between and the following:

K2 - Knowledge of electrical power supplies to the following:

K3 - Knowledge of the effect that a loss or malfunction of the will have on the following:

K4 - Knowledge of design feature(s) and/or interlock(s) which provide for the following:

K5 - Knowledge of the operational implications of the following concepts as they apply to the:

K6 - Knowledge of the effect that a loss or malfunction of the following will have on the:

A1 - Ability to predict and/or monitor changes in parameters associated with operating the controls including:

A2 - Ability to (a) predict the impacts of the following on the and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation:

A3 - Ability to monitor automatic operations of the including:

A4 - Ability to manually operate and/or monitor in the control room:

E/AK1 - Knowledge of the operational applications of the following concepts as they apply to the:

E/AK2 - Knowledge of the interrelations between and the following:

E/AK3 - Knowledge of the reasons for the following as they apply to:

E/AA1 - Ability to operate and/or monitor the following as they apply to:

E/AA2 - Ability to determine and interpret the following as they apply to:

| CATEGORY | K/A | DESCRIPTION |
|---------------------------|-------|---|
| REACTIVITY CONTROL | | |
| 201001 | K1.04 | Head spray:BWR-3 |
| | K1.05 | Feedwater [or reactor water cleanup]-CRD return to vessel: Plant-Specific |
| | K3.04 | Head spray:BWR-3 |
| | A1.04 | Head spray flow:BWR-3 |
| | A4.02 | CRD pump discharge valve |
| | A4.05 | Cooling water header pressure control valve |
| | | |
| 201002 | K4.06 | Emergency In rod insertion |
| | A3.04 | Rod movement sequence timer malfunction alarm: Plant-Specific |
| | A4.04 | Timer malfunction test switch: Plant-Specific |
| | | |
| 202002 | K1.04 | Reactor/turbine pressure regulating system: Plant-Specific |
| | K1.12 | Recirculation flow control valves: Plant-Specific |
| | K2.02 | Hydraulic power unit: Plant-Specific |
| | K3.06 | Recirculation flow control valve position: Plant-Specific |
| | K4.04 | Automatic load following: Plant-Specific |
| | K4.08 | Automatic flow control valve positioning: BWR 5,6 |
| | K4.09 | Minimum and maximum flow control valve position setpoints: BWR 5,6 |
| | K6.06 | Reactor/turbine pressure regulating system: Plant-Specific |
| | K6.07 | APRM signal input: BWR 5,6 |
| | A1.08 | Recirculation FCV position: BWR 5,6 |
| | A2.08 | FCV lockup: BWR5,6 |
| | A3.01 | Flow control valve operation: BWR 5,6 |
| | A4.02 | Hydraulic power unit: BWR 5,6 |
| | | |
| 202001 | K1.04 | Reactor/turbine pressure regulating system: Plant-Specific |
| | K1.24 | Isolation condenser: Plant-Specific |
| | K2.04 | Hydraulic power unit oil pumps: Plant-Specific |
| | K3.02 | Load following capabilities: Plant-Specific |
| | K3.12 | Isolation condenser: Plant-Specific |
| | K4.15 | Slow speed pump start: Plant-Specific |

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|--|-------|--|
| 202001 continued | K4.17 | Fast speed pump start: Plant-Specific |
| | K5.08 | E/P converters: Plant-Specific |
| | K5.09 | Hydraulically operated valves: Plant-Specific |
| | A1.08 | Recirculation FCV position: BWR 5,6 |
| | A2.23 | Suppression pool level: BWR 2,3,4 |
| | A2.25 | Recirculation flow control valve lockup: Plant-Specific |
| | A3.06 | Flow control valve position: BWR 5,6 |
| | A3.08 | Pump downshift: BWR 5,6 |
| | | |
| 201005 | ALL | RCIS |
| | | |
| 211000 | K1.10 | HPCI: Plant-Specific |
| | K6.04 | Core spray system: Plant-specific |
| | K6.05 | HPCI: Plant-Specific |
| | A1.05 | Pump amps: Plant-Specific |
| | | |
| REACTOR WATER INVENTORY CONTROL | | |
| 206000 | K4.15 | Low speed turning of the turbine rotor: BWR-2,3,4[P-Spec] |
| | K4.16 | Minimizing fission product concentration in the condensate storage tank [valve closures on system initiation]: BWR-2,3,4[P-Spec] |
| | K5.03 | GEMAC controllers: BWR-2,3,4[P-Spec] |
| | A4.11 | Turning gear: BWR-2,3,4[P-Spec] |
| | | |
| 209002 | ALL | HPCS |
| | | |
| 209001 | K5.03 | Testable check valve operation |
| | K5.06 | Recirculation operation: Plant-Specific[BWR-1] |
| | K6.09 | Fire protection: BWR-1 |
| | A2.11 | Loss of fire protection: BWR-1 |
| | A4.06 | Testable check valves |
| | A4.07 | Fill pump |
| | A4.14 | Containment level: BWR-1 |
| | | |

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|--------|-------|---|
| 256000 | K1.09 | Offgas condenser: Plant-Specific |
| | K1.12 | Isolation condenser: Plant-Specific |
| | K1.14 | RHR [LPCI]: Plant-Specific |
| | K1.15 | HPCS: Plant-Specific |
| | K1.21 | Steam seal evaporator: Plant-Specific |
| | K1.24 | Radwaste system: Plant-Specific |
| | K3.07 | Isolation condenser: Plant-Specific |
| | K3.12 | HPCS: Plant-Specific |
| | K4.01 | Condensate and/or booster pump auto start: Plant-Specific |
| | K4.11 | Isolation of SJAE's on low flow: Plant-Specific |
| | A3.09 | Feedwater heater drain tank level: Plant-Specific |
| | A4.14 | Feedwater heater drain tank level: Plant-Specific |
| | | |
| 217000 | K1.05 | Residual heat removal system |
| | K1.08 | Line fill pump: Plant-Specific |
| | | |
| 259001 | K1.15 | RHR: Plant-Specific |
| | K1.18 | Fire protection system [emergency cooling]: Plant-Specific |
| | K1.19 | Redundant reactivity control system: Plant-Specific |
| | K2.01 | Reactor feedwater pump(s): Motor-Driven-Only |
| | K3.10 | HPCS: Plant-Specific |
| | K4.01 | Auto start of RFP's: Plant-Specific |
| | K4.07 | RFP motor cooling: Motor-Driven-Only |
| | K4.10 | Feedpump runbacks; Plant-Specific |
| | K6.08 | Reactor feedwater pump motor ventilation: Motor-Driven-Only |
| | K6.13 | Redundant reactivity control: Plant-Specific |
| | A1.03 | RFP motor amps: Motor-Driven-Only |
| | A3.01 | RFP auto start: Plant-Specific |
| | A3.02 | Motor amps: Motor-Driven-Only |
| | A3.07 | FWRV position |
| | A3.11 | Reactor feedpump runbacks; Plant-Specific |
| | A4.08 | FWRV position |
| | | |
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|--------|-------|---|
| 204000 | K1.13 | RHR system: Plant-Specific |
| | K4.08 | Reducing reactor pressure upstream of low pressure piping: LP-RWCU |
| | K5.01 | Electro/Pneumatic converter operation |
| | K5.06 | Pressure controllers |
| | A2.02 | Pressure control valve failure: LP-RWCU |
| | A3.01 | System pressure downstream of the pressure regulating valve: LP-RWCU |
| 259002 | K1.09 | P sat/T sat [compensation] |
| | K1.10 | Emergency generator(s): FWCI/HPCI |
| | K1.11 | Drywell pressure: FWCI/HPCI |
| | K1.12 | Emergency condensate transfer pump: FWCI/HPCI |
| | K2.02 | Feedwater coolant injection [FWCI] initiation logic: FWCI/HPCI |
| | K4.03 | Reactor feedpump runout protection: MDFP |
| | K4.05 | P sat/T sat [compensator] |
| | K4.07 | TDRFP 20% power interlock: TDRFP |
| | K4.11 | DP control: Plant-Specific |
| | K4.13 | FWRV lockup |
| | K4.15 | Automatic initiation of feedwater system upon receipt of an ECCS initiation signal: FWCI/HPCI |
| | K4.16 | Dedication of feedwater string(s) to ECCS: FWCI/HPCI |
| | K5.08 | Heat removal mechanisms: FWCI |
| | K5.09 | Adequate core cooling: FWCI |
| | K6.06 | Reactor pressure/temperature input [for water level input compensation] |
| | K6.07 | Drywell pressure input: FWCI |
| | A1.05 | FWRV/startup level control position: Plant-Specific |
| | A1.06 | Feedwater string(s) for FWCI: FWCI |
| | A2.04 | RFP runout condition: Plant-Specific |
| | A2.08 | Receipt of an ECCS initiation signal: FWCI |
| | A2.09 | FWCI system failure alarm: FWCI |
| | A3.01 | Runout flow control: Plant-Specific |
| | A3.07 | FWRV lockup |
| | A3.08 | FWCI system initiation: FWCI |
| | A3.09 | Transfer of system from flow control to level control mode: FWCI |
| | A4.04 | FWRV lockup reset controls |

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|---------------------------------|-------|---|
| 259002 continued | A4.05 | Runout flow control reset controls: Plant-Specific |
| | A4.08 | Manually initiate FWCI: FWCI |
| | | |
| 203000 | K4.11 | Loop selection logic: Plant-Specific |
| | A2.15 | Loop selection logic failure: Plant-Specific |
| | A3.07 | Loop selection: Plant-Specific |
| | | |
| REACTOR PRESSURE CONTROL | | |
| 218000 | K1.05 | Remote shutdown system: Plant-Specific |
| | | |
| 239001 | K1.05 | Moisture separator reheaters: Plant-Specific |
| | K1.13 | Main steam isolation valve leakage control: Plant-Specific |
| | K1.14 | Positive leakage control system: Plant-Specific |
| | K1.20 | Residual heat removal system: Plant-Specific |
| | K1.21 | Isolation condenser system: Plant-Specific |
| | K2.02 | Main steam line shutoff valves [guard valves]: Plant-Specific |
| | K3.12 | Isolation condenser: Plant-Specific |
| | K3.13 | Moisture separator reheaters: Plant-Specific |
| | K3.14 | Residual heat removal system: Plant-Specific |
| | K4.03 | Insures that steam released from a steam line break will not bypass suppression pool: BWR-6 |
| | K4.11 | Positive sealing of the MSIV's when shutdown: Plant-Specific |
| | K5.04 | Definition and reason for steam blanketing of moisture separator reheaters: Plant-Specific |
| | K5.07 | Hydraulic operated MSIV's |
| | K6.07 | MSIV leakage control |
| | K6.10 | ADS/low low set: Plant-Specific |
| | A1.03 | Reheat steam pressure: Plant-Specific |
| | A1.04 | Reheat temperature: Plant-Specific |
| | A3.03 | Moisture separator reheat steam supply: Plant-Specific |
| | A3.04 | Isolation of Moisture separator reheater: Plant-Specific |
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|---------------------------------------|-------|--|
| 241000 | K1.23 | Recirculation flow control system: Plant-Specific |
| | K1.34 | EGC system: Plant-Specific |
| | K1.35 | Low pressure stop and control valves: Plant-Specific |
| | K1.36 | Primary water system: Plant-Specific |
| | K1.37 | Turbine stress evaluator: Plant-Specific |
| | K3.21 | Recirculation flow control system: Plant-Specific |
| | K3.28 | Low pressure stop and control valves: Plant-Specific |
| | K3.30 | EGC: Plant-Specific |
| | K4.11 | Load following: Plant-Specific |
| | K4.12 | Recirculation flow control: Plant-Specific |
| | K5.07 | Unitized actuator operation: Fermi-Only |
| | K6.04 | Recirculation flow control system: Plant-Specific |
| | K6.18 | Low pressure stop and control valves: Plant-Specific |
| | K6.19 | Primary water system: Plant-Specific |
| | A2.25 | Loss of primary water system: Plant-Specific |
| | A3.14 | Grid load following: Plant-Specific |
| | A3.15 | Recirculation pump flow control: Plant-Specific |
| | A3.17 | Turbine runback |
| | | |
| 239002 | K1.09 | Drywell pressure [for safety valves which discharge to the drywell airspace]: Plant-Specific |
| | K4.01 | Insures that only one or two safety/relief valves reopen following the initial portion of a reactor isolation event [LLS logic]: Plant-Specific |
| | K4.02 | Minimizes containment fatigue duty cycles resulting from relief valve cycling during decay-heat-dominant period late in an isolation transient [LLS logic]: Plant-Specific |
| | K4.07 | Minimum steam pressure required to keep SRV open or to open SRV |
| | A3.09 | Low low set logic: Plant-Specific |
| | | |
| HEAT REMOVAL from REACTOR CORE | | |
| 206000 | | <i>SEE REACTOR WATER INVENTORY CONTROL</i> |
| | | |
| 209002 | ALL | HPCS |
| | | |

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|------------------------------|-------|---|
| 207000 | ALL | ISOLATION CONDENSER |
| | | |
| 209001 | | <i>SEE REACTOR WATER INVENTORY CONTROL</i> |
| | | |
| 239001 | | <i>SEE REACTOR PRESSURE CONTROL</i> |
| | | |
| 245000 | K2.03 | Amplidyne: Plant-Specific |
| | K2.05 | Air seal oil pumps: Plant-Specific |
| | A3.12 | Automatic turbine control: Plant-Specific |
| | A4.13 | Generator power factor: Plant-Specific |
| | | |
| 217000 | | <i>SEE REACTOR WATER INVENTORY CONTROL</i> |
| | | |
| 202001 | | <i>SEE REACTIVITY CONTROL</i> |
| | | |
| 203000 | | <i>SEE REACTOR WATER INVENTORY CONTROL</i> |
| | | |
| 205000 | K1.09 | Auxiliary steam supply: Plant-Specific |
| | K1.11 | Nitrogen: Plant-Specific |
| | K1.12 | Isolation condenser: Plant-Specific |
| | K4.01 | High temperature isolation: Plant-Specific |
| | K6.06 | Auxiliary steam supply: Plant-Specific |
| | K6.07 | Nitrogen: Plant-Specific |
| | A2.02 | Low shutdown cooling suction pressure: Plant-Specific |
| | | |
| CONTAINMENT INTEGRITY | | |
| 223001 | K1.13 | HPCS: Plant-Specific |
| | K2.01 | Atmosphere containment/atmospheric dilution compressors: Plant-Specific |
| | K2.03 | Pumpback compressors: Plant-Specific |
| | K2.04 | Combustible gas mixing compressors: Mark III |
| | K2.06 | Hydrogen igniters: Plant-Specific |
| | K2.08 | Containment cooling air handling units: Plant-Specific |
| | K2.10 | Drywell chillers: Plant-Specific |
| | K4.06 | Maintains proper containment/secondary containment to drywell differential pressure |

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|------------------|-------|---|
| 223001 continued | K5.02 | Guard pipe operation: Mark III |
| | K5.04 | Horizontal vent operation: Mark III |
| | K5.06 | Hydrogen igniter operation: Plant-Specific |
| | K5.15 | Moisture content measurement: Plant-Specific |
| | K6.02 | Containment cooling: Mark III |
| | K6.07 | Hydrogen igniter system: Plant-Specific |
| | K6.10 | Containment vacuum relief system: Mark III |
| | A1.03 | Containment pressure: Mark III |
| | A1.04 | Containment temperature: Mark III |
| | A1.11 | Reactor building to suppression chamber differential pressure; Plant-Specific |
| | A2.06 | High containment pressure: Mark III |
| | A2.13 | High containment temperature: Mark III |
| | A2.14 | Low containment to annulus pressure: Mark III |
| | A3.07 | Containment/drywell differential pressure: Mark III |
| | A4.01 | Containment relief valves: Mark III |
| | A4.02 | ACAD compressors: Plant-Specific |
| | A4.06 | Containment pressure: Mark III |
| | A4.14 | Hydrogen igniters: Plant-Specific |
| | | |
| 223002 | K1.05 | Isolation condenser: Plant-Specific |
| | K1.15 | High pressure core spray: Plant-Specific |
| | K1.18 | Reactor building drainage system: Plant-Specific |
| | K1.21 | Circulating water: Plant-Specific |
| | K1.23 | River water makeup: Plant-Specific |
| | K3.13 | Isolation condenser: Plant-Specific |
| | K3.23 | High pressure core spray: Plant-Specific |
| | K3.27 | Circulating water |
| | K3.29 | River water makeup |
| | | |
| 290002 | K1.06 | HPCS: Plant-Specific |
| | K1.07 | Isolation condenser: Plant-Specific |
| | K1.18 | Loss parts monitoring: Plant-Specific |
| | K6.12 | Isolation condenser: Plant-Specific |
| | K6.16 | Loss parts monitoring |

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|-------------------|-------|---|
| 2290002 continued | K6.19 | HPCS: Plant-Specific [BWR-5,6] |
| | | |
| 219000 | K1.02 | Condensate storage tank |
| | K6.05 | Condensate storage tank: Plant-Specific |
| | A1.05 | Condensate storage tank level: Plant-Specific |
| | A1.10 | Containment air temperature: Mark-III |
| | A4.10 | Condensate storage tank level: Plant-Specific |
| | | |
| 226001 | K1.10 | Containment [spray penetration]: Mark III |
| | K4.09 | Automatic containment spray initiation: BWR-6 |
| | K6.09 | Reactor building to suppression chamber vacuum breakers: Plant-Specific |
| | A4.17 | Manual initiation controls: BWR-6 |
| | A4.18 | Automatic system initiation reset: BWR-6 |
| | | |
| 230000 | K6.09 | Reactor building to suppression pool vacuum breakers |
| | | |
| 290001 | K1.05 | Auxiliary building ventilation: Plant-Specific |
| | K1.06 | Auxiliary building isolation: BWR-6 |
| | K4.04 | Auxiliary building isolation: BWR-6 |
| | K5.01 | Vacuum breaker operation: BWR-4 |
| | K5.02 | Flow measurement: BWR-3 |
| | K6.05 | Auxiliary building ventilation: Plant-Specific |
| | K6.09 | AC power: BWR-6 |
| | A1.02 | High area temperature: BWR-6 |
| | A2.06 | Auxiliary building isolation: BWR-6 |
| | A4.03 | Auxiliary building differential pressure: Plant-Specific |
| | A4.04 | Auxiliary building area temperature: Plant-Specific |
| | A4.05 | Fuel building differential pressure: Plant-Specific |
| | A4.06 | Fuel building area temperature: Plant-Specific |
| | A4.08 | Radwaste building area temperature: Plant-Specific |
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| ELECTRICAL | | |
| 264000 | K2.03 | Turning gear [jet engine]: Plant-Specific |
| | K2.04 | Ignition system [jet engine]: Plant-Specific |
| | K6.04 | Turning gear [jet engine]: Plant-Specific |
| | K6.05 | Ignition system failure [jet engine]: Plant-Specific |
| | A1.07 | Gas generator temperature: Plant-Specific |
| | A1.08 | Gas generator speed: Plant-Specific |
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| 262002 | A2.04 | Abnormal battery operation: BWR-1 |
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| INSTRUMENTATION | | |
| 215005 | K1.09 | Reactor recirculation system: BWR-5,6 |
| | K1.11 | Rod control and information system: Plant-Specific |
| | K1.15 | Redundant reactivity control system: Plant-Specific |
| | K3.02 | Reactor recirculation system: BWR-5,6 |
| | K3.04 | Rod control and information system: Plant-Specific |
| | A1.06 | Recirculation flow control valve position: Plant-Specific |
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| 215003 | K1.03 | Rod control and information system: Plant-Specific |
| | K3.03 | Rod control and information system: Plant-Specific |
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| 216000 | K1.04 | High pressure core spray system: Plant-Specific |
| | K1.11 | MSIV leakage control system: Plant-Specific |
| | K1.15 | Isolation condenser: Plant-Specific |
| | K1.18 | Analog trip system: Plant-Specific |
| | K2.01 | Analog trip system: Plant-Specific |
| | K3.04 | High pressure core spray system: Plant-Specific |
| | K3.11 | MSIV leakage control system: Plant-Specific |
| | K3.15 | Isolation condenser: Plant-Specific |
| | K3.18 | Analog trip system: Plant-Specific |
| | K3.28 | Loose parts detection in the primary system: Plant-Specific |
| | K5.05 | Vessel vibration measurement [loose parts monitor] |
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| 212000 | K1.07 | Relief/safety valves [low-low-set logic]: Plant-Specific |
| | K1.11 | Condenser vacuum |
| | K4.06 | Select rod insertion: Plant-Specific |
| | A2.13 | Low condenser vacuum: Plant-Specific |
| | A4.03 | Provide manual select rod insertion: Plant-Specific |
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| 201005 | ALL | RCIS |
| | | |
| 214000 | K1.06 | RCIS: Plant-Specific |
| | K3.04 | RCIS: Plant-Specific |
| | A3.04 | RCIS: Plant-Specific |
| | A4.01 | RCIS rod action bypass switches |
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| 201004 | A3.02 | Rod select bottom lamp dimmer logic: BWR4,5 |
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| 201006 | K1.03 | Reactor water level control [feed flow]: P-Spec [Not BWR-6] |
| | K1.08 | Reactor power [turbine first stage pressure]: P-Spec [Not BWR-6] |
| | K6.02 | Reactor water level control input: P-Spec [Not BWR-6] |
| | A2.06 | Loss of reactor water level control input: P-Spec [Not BWR-6] |
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| 215004 | K1.03 | Rod control and information system: Plant-Specific |
| | K3.03 | Rod control and information system: Plant-Specific |
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| PLANT SERVICE SYSTEMS | | |
| 286000 | K1.02 | Isolation condenser: Plant-Specific |
| | K1.06 | Auxiliary steam system: Plant-Specific |
| | K1.08 | Intake canals: Plant-Specific |
| | K1.11 | Screen wash system: Plant-Specific |
| | K5.08 | Gas refrigeration: Plant-Specific |
| | K6.04 | Diesel fuel transfer system: Plant-Specific |
| | K6.05 | Screen wash system: Plant-Specific |
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| 234000 | K1.06 | RC&IS: Plant-Specific |
| | K1.07 | Fuel transfer tube system: Mark III |
| | K1.08 | Fuel pools configuration: Mark III |
| | K3.02 | RC&IS: Plant-Specific |
| | K4.05 | Movement of fuel via fuel transfer tube: Mark III |
| | K6.03 | RC&IS: Plant-Specific |
| | K6.05 | Upper fuel pool water inventory: Mark III |
| | K6.06 | Fuel transfer tube interlocks: Mark III |
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| 300000 | K2.02 | Emergency air compressor |
| | K5.04 | Service air refusal valve |
| | K6.04 | Service air refusal valve |
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| RADIOACTIVITY RELEASE | | |
| 239003 | ALL | MSIV LEAKAGE CONTROL |
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| 271000 | K2.01 | Glycol pumps |
| | K6.12 | Glycol system |
| | K6.13 | Plant exhaust: BWR-1 |
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| 272000 | K1.07 | Isolation condenser: Plant-Specific |
| | K1.11 | Reactor building overhead crane: Plant-Specific |
| | K1.15 | Filter building: Plant-Specific |
| | K1.20 | Auxiliary building: Plant-Specific |
| | K1.22 | Fuel building: Mark III |
| | K3.07 | Reactor building overhead crane operation: Plant-Specific |
| | K3.08 | Auxiliary building ventilation: Plant-Specific |
| | A3.05 | Refuel floor overhead crane operation interrupt: Plant-Specific |
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| 233000 | K1.10 | Containment drainage system: Plant-Specific |
| | K4.08 | Pool cooling during loss of coolant accident: BWR-6 |
| | A1.11 | Suppression pool chemistry: BWR-6 |
| | A2.17 | Fuel transfer tube drain tank high level/low level: BWR-6 |

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| 261000 | K1.05 | Radwaste system: Plant-Specific |
| | K6.07 | Primary containment atmosphere sampling system: Plant-Specific |
| | A1.06 | Drywell and suppression chamber differential pressure: Mark I |
| | A2.15 | High area radiation on refuel bridge: Plant-Specific |
| EMERGENCY PLANT EVOLUTIONS | | |
| 295024 | EK1.02 | Containment building integrity: Mark III |
| | EK2.02 | HPCS: Plant-Specific |
| | EK2.09 | Suppression pool makeup: Plant-Specific |
| | EK2.14 | Containment pressure: Mark III |
| | EK2.19 | Feedwater and condensate: Plant-Specific |
| | EK2.20 | DC distribution: Plant-Specific |
| | EK3.03 | Containment venting: Mark III |
| | EA1.02 | HPCS: Plant-Specific |
| | EA1.09 | Suppression pool makeup: Plant-Specific |
| | EA1.18 | Containment ventilation system: Mark III |
| | EA1.21 | Recirculation system [LPCI loop select logic]: Plant-Specific |
| | EA1.22 | DC distribution: Plant-Specific |
| | EA2.07 | Containment radiation levels: Mark III |
| | EA2.09 | Containment pressure: Mark III |
| | EA2.10 | Containment temperature: Mark III |
| 295025 | EK2.02 | Isolation condenser: Plant-Specific |
| | EK2.03 | RRCS: Plant-Specific |
| | EK3.04 | Isolation condenser initiation: Plant-Specific |
| | EK3.07 | RRCS initiation: Plant-Specific |
| | EK3.09 | Low-low set initiation: Plant-Specific |
| | EA1.06 | Isolation condenser: Plant-Specific |
| | EA1.08 | RRCS: Plant-Specific |

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| 295026 | EK2.05 | Containment pressure: Mark III |
| 295027 | ALL | Mark III Only |
| 295029 | EK2.03 | HPCS: Plant-Specific |
| | EK2.04 | Suppression pool cleanup system: Plant-Specific |
| | EA1.02 | HPCS: Plant-Specific |
| 295030 | EK2.05 | HPCS: Plant-Specific |
| | EK2.06 | Suppression pool makeup: Mark III |
| | EK3.04 | HPCS operation: Plant-Specific |
| | EK3.05 | Suppression pool makeup operation: Mark III |
| | EA1.03 | HPCS: Plant-Specific |
| | EA1.04 | Suppression pool makeup: Mark III |
| 295031 | EK2.07 | High pressure core spray: Plant-Specific |
| | EK2.10 | Redundant reactivity control: Plant-Specific |
| | EA1.04 | High pressure core spray: Plant-Specific |
| | EA1.09 | Isolation condenser: Plant-Specific |
| 295034 | EK2.05 | Fuel building ventilation: Mark III |
| | EK3.04 | Fuel building ventilation: Plant-Specific |
| | EA1.05 | Fuel building ventilation: Plant-Specific |
| 295037 | EK2.02 | RRCS: Plant-Specific |
| | EK2.12 | Rod control and information system: Plant-Specific |
| | EA1.02 | RRCS: Plant-Specific |
| | EA1.08 | Rod control and information system: Plant-Specific |
| 295038 | EK2.11 | MSIV leakage control: Plant-Specific |
| | EK2.12 | Feedwater leakage control: BWR-6 |

| ABNORMAL PLANT EVOLUTIONS | | |
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| 295001 | AK2.05 | LPCI loop select logic: Plant- Specific |
| | AK2.08 | Standby liquid control: BWR-1 |
| | AA1.04 | Rod control and information: BWR-5&6 |
| | AA1.08 | Standby liquid control: BWR-1 |
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| 295002 | AK2.09 | Vacuum drag (low conductivity drain): Plant-Specific |
| | AK2.10 | Reactor recirculation system: Plant_Specific |
| | AK3.01 | Reactor SCRAM: Plant-Specific |
| | AK3.08 | Recirculation system run-backs: Plant-Specific |
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| 295003 | AK2.05 | Isolation condenser: Plant-Specific |
| | AK3.07 | Initiation of isolation condenser: Plant-Specific |
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| 295004 | AK3.03 | Reactor SCRAM: Plant-Specific |
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| 295005 | AK2.06 | Seal steam evaporator: Plant-Specific |
| | AK2.09 | Feedwater-HPCI actuation: BWR-2 |
| | AK3.08 | Feedwater-HPCI actuation: BWR-2 |
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| 295006 | AK3.05 | Direct turbine generator trip: Plant-Specific |
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| 295007 | AK3.01 | Isolation condenser operation: Plant-Specific |
| | AK3.05 | Low pressure system isolation |
| | AA1.01 | Isolation condenser: Plant-Specific |
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| 295008 | AK1.04 | Containment integrity: Alis-Chalmers |
| | AK2.01 | RPS: Plant-Specific |
| | AK2.07 | HPCS: Plant-Specific |
| | AK3.02 | Reactor SCRAM: Plant-Specific |
| | AK3.07 | HPCS isolation: Plant-Specific |
| | AK3.09 | HPCS injection valve closure: Plant-Specific |
| | AA1.06 | HPCS: Plant-Specific |
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| 295009 | AK3.02 | Reactor feedpump runout flow control: Plant-Specific |
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| 295010 | AK1.02 | Submergence vent control: Mark III |
| | AK2.03 | Drywell/containment differential pressure: Mark-III |
| | AA2.04 | Drywell humidity: Plant-Specific |
| | AA2.05 | Drywell air cooler drain flow: BWR-6 |
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| 295011 | ALL | Mark III only |
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| 295012 | AA2.03 | Drywell humidity: Plant-Specific |
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| 295014 | AK2.09 | Rod control and information system: Plant-Specific |
| | AA1.04 | Rod control and information system: Plant-Specific |
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| 295015 | AK2.03 | Rod control and information system: Plant-Specific |
| | AA1.04 | Rod control and information system: Plant-Specific |
| | | |
| 295016 | AA1.09 | Isolation/emergency condenser(s): Plant-Specific |
| | | |
| 295017 | AK2.11 | MSIV leakage control: Plant-Specific |
| | AA1.08 | MSIV leakage control: Plant-Specific |
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| 295019 | AK2.13 | Isolation condenser: Plant-Specific |
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| 295020 | AK2.05 | Isolation condenser: Plant-Specific |
| | | |
| 295023 | AK2.06 | Containment ventilation: Mark III |
| | AK3.05 | Initiation of SLC/shutdown cooling: Plant-Specific |
| | AA1.08 | Containment building ventilation: Mark III |
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| 600000 | AA2.01 | Gas treatment system |
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