# EXAMINATION OUTLINE SUBMITTAL FOR THE

# CLINTON POWER STATION INITIAL EXAMINATION

# AUGUST 2007

AmerGen

An Exelon Company

Clinton Power Station
R. R. 3, Box 228
Clinton, IL 61727

U-603805
March 6, 2007

Mr. James L. Caldwell
Regional Administrator
U. S. Nuclear Regulatory Commission
2443 Warrenville Road, Suite 210
Lisle, Illinois 60532-4352

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Subject: Submittal of Initial Licensing Examination Outline

Enclosed are the examination outlines which Amergen Energy Company (AmerGen), LLC is submitting in support of the Initial License Examination scheduled to start the week of August 13, 2007, for two weeks at Clinton Power Station.

This submittal includes all appropriate Examination Standard forms and outlines in accordance with NUREG-1021, Revision 9 Supplement 1, "Operating Licensing Examination Standards for Power Plants."

In accordance with NUREG-1021, Section ES-201, "Initial Operator Licensing Examination Process", please ensure that these materials are withheld from public disclosure until after the examinations are complete.

Should you have any questions related to this information, please contact Mr. Tom Pickley at (217) 937-4118.

Respectfully,

Kent Scott
Regulatory Assurance Manager
Clinton Power Station

EET/blf

cc: (w/o attachments)
Chief, NRC Operator Licensing Branch
NRC Senior Resident Inspector - Clinton Power Station

MAR 12 2007

Attachments: (Hand delivered to NRC Region III Chief Examiner)
Examination Security Agreement (Form ES-201-3),
Administrative Topics Outline (Form ES-301-1),
Control Room/In-Plant Systems Outline (Form ES-301-2),
BWR Examination Outline (Form ES-401-1),
Record of Rejected K/As (Form ES-401-4),
Operational Scenarios Outline (Form ES-D-1),
Examination Outline Quality Checklist (Form ES-201-2), and
Transient and Event Checklist (Form ES-301-5).
Outline Methodology for 2007 Clinton Power Station Written NRC Exam

Facility: Clinton Date of Examination: 08/13/07

| Item | Task Description | Initials a | b* | c# |
|---|---|---|---|---|
| 1. WRITTEN | a. Verify that the outline(s) fit(s) the appropriate model, in accordance with ES-401. | YP | SDH | bm |
| | b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all K/A categories are appropriately sampled. | YP | SDH | bm |
| | c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics. | YP | SDH | bm |
| | d. Assess whether the justifications for deselected or rejected K/A statements are appropriate. | YP | SDH | bm |
| 2. SIMULATOR | a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, technical specifications, and major transients. | YP | SDH | bm |
| | b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity, and ensure that each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s), and scenarios will not be repeated on subsequent days. | YP | SDH | bm |
| | c. To the extent possible, assess whether the outline(s) conform(s) with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D. | YP | SDH | bm |
| 3. W/T | a. Verify that the systems walk-through outline meets the criteria specified on Form ES-301-2:<br>(1) the outline(s) contain(s) the required number of control room and in-plant tasks distributed among the safety functions as specified on the form<br>(2) task repetition from the last two NRC examinations is within the limits specified on the form<br>(3) no tasks are duplicated from the applicants' audit test(s)<br>(4) the number of new or modified tasks meets or exceeds the minimums specified on the form<br>(5) the number of alternate path, low-power, emergency, and RCA tasks meet the criteria on the form | YP | SDH | bm |
| | b. Verify that the administrative outline meets the criteria specified on Form ES-301-1:<br>(1) the tasks are distributed among the topics as specified on the form<br>(2) at least one task is new or significantly modified<br>(3) no more than one task is repeated from the last two NRC licensing examinations | YP | SDH | bm |
| | c. Determine if there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on subsequent days. | YP | SDH | bm |
| 4. GENERAL | a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam section. | YP | SDH | bm |
| | b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate. | YP | SDH | bm |
| | c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5. | YP | SDH | bm |
| | d. Check for duplication and overlap among exam sections. | YP | SDH | bm |
| | e. Check the entire exam for balance of coverage. | YP | SDH | bm |
| | f. Assess whether the exam fits the appropriate job level (RO or SRO). | YP | SDH | bm |

| | Printed Name / Signature | Date |
|---|---|---|
| a. Author | TOM PICKLEY | 2/26/07 |
| b. Facility Reviewer (*) | Stacey D. Hagan | 2/26/07 |
| c. NRC Chief Examiner (#) | Dell McNeil / Dell McNeil | 3/12/07 |
| d. NRC Supervisor | Jhonor Peterson | 4/2/07 |

NOTE: # Independent NRC Reviewer initial items in Column "c"; chief examiner concurrence required.

Facility: Clinton Date of Examination: 08/13/07

Examination Level: RO ☒ SRO ☐ Operating Test Number: ILT0601-1

| Administrative Topic (See Note) | Type Code* | Describe activity to be performed |
|---|---|---|
| Conduct of Operations | S, D | Print Reading / G2.1.24 RO 2.8<br>Given a report of a tripped 480V breaker and a failure of any alarms, determine which annunciator should have alarmed. |
| Conduct of Operations | S, M | Perform Surveillance 9820.01 Power Distribution Limits with two thermal limits out of spec. / G2.1.33 RO 3.4 |
| Equipment Control | S, D | Calculate Reactor Coolant Leakage per the surveillance procedure/ G2.2.12 RO 3.0 |
| Radiation Control | D | Respond to an Alarming Dosimeter during the inplant walk through / G2.3.10 RO 2.9 |
| Emergency Plan | | |

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 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: Clinton Date of Examination: 08/13/07

Examination Level: RO ☐ SRO ☒ Operating Test Number: ILT0601-1

| Administrative Topic (See Note) | Type Code* | Describe activity to be performed |
|---|---|---|
| Conduct of Operations | S, D | Print Reading / G2.1.24 SRO 3.1<br>Given a report of a tripped 480V breaker and a failure of any alarms, determine which annunciator should have alarmed. |
| Conduct of Operations | R, D | Review Surveillance 9820.01 Power Distribution Limits, one thermal limit is out of spec / G2.1.12 SRO 4.0 |
| Equipment Control | R, D | Review surveillance for Reactor Coolant Leakage and recognize entry condition to Reactor Coolant leakage off-Normal / G2.2.12 SRO 3.4 |
| Radiation Control | R, D | Respond to an Alarming Dosimeter during inplant walk through / G2.3.10 SRO 3.3 |
| Emergency Plan | R, N | EAL Determination G2.4.41 SRO 4.1 |

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 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: Clinton Date of Examination: 08/13/07

Exam Level: RO ☒ SRO-I ☐ SRO-U ☐ Operating Test Number: ILT0601-1

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

| System / JPM Title | Type Code* | Safety Function |
|---|---|---|
| a. 211000A4.06 / Initiate SLC, RWCU Fails to Isolate | A, D, E, S | 1 |
| b. 209002A4.02 / Swap HPCS Suction, Storage Tank suction valve fails to auto close | A, D, S | 2 |
| c. 239001A4.02 / Control Reactor pressure using Steam Line Drains | D, S, L | 3 |
| d. 217000A4.01 / Shutdown RCIC Initiation Signal Clear | D, S | 4 |
| e. 219000A4.01 / Place RHR A in Suppression Pool Cooling, the RHR pump trips | A, D, S | 5 |
| f. 201005A4.03 / Use Alt Methods to Determine Rod Position | C, D, E, L | 7 |
| g. 300000A4.01 / Restore ADS Air Supply to Normal Source, normal source does not maintain pressure | A, N, S | 8 |
| h. 288000A4.01 / Startup CCP, auto fails must start manually | A, N, S | 9 |
| In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U) | | |
| i. 264000G2.1.30 / Reset A DG After Overspeed | D, R | 6 |
| j. 295028EA1.03 / Reset Shunt Trips to Restore Drywell Cooling | D, E, R | 5 |
| k. 295037EA1.03 / Defeating ARI Logic Trips | D, E | 7 |

@ 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: Clinton Date of Examination: 08/13/07

Exam Level: RO ☐ SRO-I ☒ SRO-U ☐ Operating Test Number: ILT0601-1

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

| System / JPM Title | Type Code* | Safety Function |
|---|---|---|
| a. 211000A4.06 / Initiate SLC, RWCU Fails to Isolate | A, D, E, S | 1 |
| b. 209002A4.02 / Swap HPCS Suction, Storage Tank suction valve fails to auto close | A, D, S | 2 |
| c. 239001A4.02 / Control Reactor pressure using Steam Line Drains | D, S, L | 3 |
| d. 217000A4.01 / Shutdown RCIC Initiation Signal Clear | D, S | 4 |
| e. 219000A4.01 / Place RHR A in Suppression Pool Cooling, the RHR pump trips | A, D, S | 5 |
| f. | | |
| g. 300000A4.01 / Restore ADS Air Supply to Normal Source, normal source does not maintain pressure | A, N, S | 8 |
| h. 288000A4.01 / Startup CCP, auto fails must start manually | A, N, S | 9 |
| In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U) | | |
| i. 264000G2.1.30 / Reset A DG After Overspeed | D, R | 6 |
| j. 295028EA1.03 / Reset Shunt Trips to Restore Drywell Cooling | D, E, R | 5 |
| k. 295037EA1.03 / Defeating ARI Logic Trips | D, E | 7 |

@ 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: Clinton Date of Examination: 08/13/07

Exam Level: RO ☐ SRO-I ☐ SRO-U ☒ Operating Test Number: ILT0601-1

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

| System / JPM Title | Type Code* | Safety Function |
|---|---|---|
| a. 211000A4.06 / Initiate SLC, RWCU Fails to Isolate | A, D, E, S | 1 |
| b. | | |
| c. 239001A4.02 / Control Reactor pressure using Steam Line Drains | D, S, L | 3 |
| d. | | |
| e. | | |
| f. | | |
| g. 300000A4.01 / Restore ADS Air Supply to Normal Source, normal source does not maintain pressure (ESF) | A, N, S | 8 |
| h. | | |
| In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U) | | |
| i. | | |
| j. 295028EA1.03 / Reset Shunt Trips to Restore Drywell Cooling | D, E, R | 5 |
| k. 295037EA1.03 / Defeating ARI Logic Trips | D, E | 7 |

@ 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 | |

## ES-301 Transient and Event Checklist Form ES-301-5

Facility: Clinton | Date of Exam: 8/13/2007 | Operating Test Number: ILT0601-1

| APPLICANT | EVENT TYPE | Scenarios | | | | | | | | | | | | TOTAL | MINIMUM(*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | | | 2 | | | 3 | | | 4 | | | | | | |
| | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | | | | |
| | | SRO | ATC | BOP | SRO | ATC | BOP | SRO | ATC | BOP | SRO | ATC | BOP | | R | I | U |
| RO ☐ SRO-I ☒ SRO-U ☐ | RX | 1 | | | | 6 | | 6 | | | | | | 3 | 1 | 1 | 0 |
| | NOR | 5 | | | | | | 2 | | | | | | 2 | 1 | 1 | 1 |
| | I/C | 2, 3, 7, 8 | | | | 4, 7 | | 1, 3, 4, 5 | | | | | | 10 | 4 | 4 | 2 |
| | MAJ | 9, 10, 11 | | | | 8, 9 | | 7, 8, 9 | | | | | | 8 | 2 | 2 | 1 |
| | TS | 4, 6 | | | | | | 3, 5 | | | | | | 4 | 0 | 2 | 2 |
| RO ☐ SRO-I ☒ SRO-U ☐ | RX | | 1 | | 6 | | | | | | | | | 2 | 1 | 1 | 0 |
| | NOR | | | | 1 | | | | | 2 | | | | 2 | 1 | 1 | 1 |
| | I/C | | 2, 7 | | 2, 4, 5, 7 | | | | | 3, 4 | | | | 8 | 4 | 4 | 2 |
| | MAJ | | 9,10,11 | | 8, 9 | | | | | 7, 8, 9 | | | | 8 | 2 | 2 | 1 |
| | TS | | | | 1, 3 | | | | | | | | | 2 | 0 | 2 | 2 |
| RO ☒ SRO-I ☐ SRO-U ☐ | RX | | | | | | | | 6 | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | 5 | | | 1 | | | | | | | 2 | 1 | 1 | 1 |
| | I/C | | | 3, 8 | | | 2, 5 | | 1, 5 | | | | | 6 | 4 | 4 | 2 |
| | MAJ | | | 9,10, 11 | | | 8, 9 | | 7, 8, 9 | | | | | 8 | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | 0 | 0 | 2 | 2 |
| RO ☒ SRO-I ☐ SRO-U ☐ | RX | | 1 | | | | | | | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | | | | 1 | | | | | | | 1 | 1 | 1 | 1 |
| | I/C | | 2, 7 | | | | 2, 5 | | | | | | | 4 | 4 | 4 | 2 |
| | MAJ | | 9,10, 11 | | | | 8, 9 | | | | | | | 5 | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | 0 | 0 | 2 | 2 |

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must do one scenario, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

## ES-301 Transient and Event Checklist Form ES-301-5

Facility: Clinton | Date of Exam: 8/13/2007 | Operating Test Number: ILT0601-1

| APPLICANT | EVENT TYPE | Scenarios 1 CREW POSITION SRO | 1 ATC | 1 BOP | 2 SRO | 2 ATC | 2 BOP | 3 SRO | 3 ATC | 3 BOP | 4 SRO | 4 ATC | 4 BOP | TOTAL | MINIMUM(*) R | I | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RO ☒ SRO-I ☐ SRO-U ☐ | RX | | | | | | | | 6 | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | 5 | | | | | | | | | | 1 | 1 | 1 | 1 |
| | I/C | | | 3, 8 | | | | | 1, 5 | | | | | 4 | 4 | 4 | 2 |
| | MAJ | | | 9,10, 11 | | | | | 7, 8, 9 | | | | | 6 | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | 0 | 0 | 2 | 2 |
| RO ☐ SRO-I ☐ SRO-U ☒ | RX | | | | 6 | | | | | | | | | 1 | 1 | 1 | 0 |
| | NOR | | | | 1 | | | | | 2 | | | | 2 | 1 | 1 | 1 |
| | I/C | | | | 2, 4, 5, 7 | | | | | 3, 4 | | | | 6 | 4 | 4 | 2 |
| | MAJ | | | | 8, 9 | | | | | 7, 8, 9 | | | | 5 | 2 | 2 | 1 |
| | TS | | | | 1, 3 | | | | | | | | | 2 | 0 | 2 | 2 |
| RO ☐ SRO-I ☐ SRO-U ☐ | RX | | | | | | | | | | | | | | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | | 1 | 1 | 1 |
| | I/C | | | | | | | | | | | | | | 4 | 4 | 2 |
| | MAJ | | | | | | | | | | | | | | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | | 0 | 2 | 2 |
| RO ☐ SRO-I ☐ SRO-U ☐ | RX | | | | | | | | | | | | | | 1 | 1 | 0 |
| | NOR | | | | | | | | | | | | | | 1 | 1 | 1 |
| | I/C | | | | | | | | | | | | | | 4 | 4 | 2 |
| | MAJ | | | | | | | | | | | | | | 2 | 2 | 1 |
| | TS | | | | | | | | | | | | | | 0 | 2 | 2 |

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must do one scenario, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Facility Name: Clinton Power Station Date of Exam: 08/13/2007

| Tier | Group | RO K/A Category Points | | | | | | | | | | | | SRO-Only Points | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G * | Total | A2 | | G* | | Total | | | | |
| 1. Emergency & Abnormal Plant Evolutions | 1 | 3 | 3 | 4 | N/A | | | 3 | 4 | N/A | | 3 | 20 | 4 | | 3 | | 7 | | | | |
| | 2 | 1 | 1 | 1 | | | | 1 | 2 | | | 1 | 7 | 2 | | 1 | | 3 | | | | |
| | Tier Totals | 4 | 4 | 5 | | | | 4 | 6 | | | 4 | 27 | 6 | | 4 | | 10 | | | | |
| 2. Plant Systems | 1 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 26 | 3 | | 2 | | 5 | | | | |
| | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 12 | 0 | 3 | 0 | | 3 | | | | |
| | Tier Totals | 3 | 4 | 3 | 4 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 38 | 6 | | 2 | | 8 | | | | |
| 3. Generic Knowledge and Abilities Categories | | 1 | | 2 | | 3 | | 4 | | 10 | | | | 1 | 2 | 3 | 4 | 7 | | | | |
| | | 2 | | 3 | | 2 | | 3 | | | | | | 2 | 2 | 1 | 2 | | | | | |

Note:
1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
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 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; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

| ES-401 | BWR Examination Outline | | | | | | | Form ES-401-1 | |
|---|---|---|---|---|---|---|---|---|---|
| Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO) | | | | | | | | | |
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
| 295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4 | | | | | | 01 32 | Ability to explain and apply system limits and precautions | 3.4 | 1 |
| 295003 Partial or Complete Loss of AC / 6 | | | 02 | | | | Selective tripping | 2.9 | 1 |
| 295004 Partial or Total Loss of DC Pwr / 6 | | 03 | | | | | D.C. bus loads | 3.3 | 1 |
| 295005 Main Turbine Generator Trip / 3 | | | | | 06 | | Feedwater temperature | 2.6 | 1 |
| 295006 SCRAM / 1 | | | | | 02 | | Control rod position | 4.3 | 1 |
| 295016 Control Room Abandonment / 7 | | | 03 | | | | Disabling control room controls | 3.5 | 1 |
| 295018 Partial or Total Loss of CCW / 8 | | | | | 01 | | Component temperatures | 3.3 | 1 |
| 295019 Partial or Total Loss of Inst. Air / 8 | | | 03 | | | | Service air isolations: Plant-Specific | 3.2 | 1 |
| 295021 Loss of Shutdown Cooling / 4 | 02 | | | | | | Thermal stratification | 3.3 | 1 |
| 295023 Refueling Acc / 8 | | | | 04 | | | Radiation monitoring equipment | 3.4 | 1 |
| 295024 High Drywell Pressure / 5 | | | | | 08 | | Drywell radiation levels | 3.6 | 1 |
| 295025 High Reactor Pressure / 3 | | | 06 | | | | Alternate rod insertion: Plant-Specific | 4.2 | 1 |
| 295026 Suppression Pool High Water Temp. / 5 | | | | 03 | | | Temperature monitoring | 3.9 | 1 |
| 295027 High Containment Temperature / 5 | 01 | | | | | | Equipment environmental qualifications: Mark-III | 2.5 | 1 |
| 295028 High Drywell Temperature / 5 | | | | | | 01 33 | Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications | 3.4 | 1 |
| 295030 Low Suppression Pool Wtr Lvl / 5 | 03 | | | | | | Heat capacity | 3.8 | 1 |
| 295031 Reactor Low Water Level / 2 | | 06 | | | | | Automatic depressurization system | 4.2 | 1 |
| 295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1 | | 01 | | | | | RPS | 4.2 | 1 |
| 295038 High Off-site Release Rate / 9 | | | | | | 01 30 | Ability to locate and operate components, including local controls | 3.9 | 1 |
| 600000 Plant Fire On Site / 8 | | | | 08 | | | Fire fighting equipment used on each class of fire | 2.6 | 1 |
| K/A Category Totals: | 3 | 3 | 4 | 3 | 4 | 3 | Group Point Total: | | 20 |

| ES-401 | BWR Examination Outline | | | | | | | | Form ES-401-1 |
|---|---|---|---|---|---|---|---|---|---|
| Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO) | | | | | | | | | |
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
| 295002 Loss of Main Condenser Vac / 3 | | | | | | | | | 0 |
| 295007 High Reactor Pressure / 3 | | | | | | | | | 0 |
| 295008 High Reactor Water Level / 2 | | | | 07 | | | Main turbine. Plant-Specific | 3.4 | 1 |
| 295009 Low Reactor Water Level / 2 | | | | | | | | | 0 |
| 295010 High Drywell Pressure / 5 | | | | | | | | | 0 |
| 295011 High Containment Temp / 5 | | | | | | | | | 0 |
| 295012 High Drywell Temperature / 5 | | | | | | | | | 0 |
| 295013 High Suppression Pool Temp. / 5 | | | | | | | | | 0 |
| 295014 Inadvertent Reactivity Addition / 1 | | | | | | | | | 0 |
| 295015 Incomplete SCRAM / 1 | 01 | | | | | | Shutdown margin | 3.6 | 1 |
| 295017 High Off-site Release Rate / 9 | | | | | 05 | | Meteorological data | 2.5 | 1 |
| 295020 Inadvertent Cont. Isolation / 5 & 7 | | 04 | | | | | RWCU system | 3.1 | 1 |
| 295022 Loss of CRD Pumps / 1 | | | | | | | | | 0 |
| 295029 High Suppression Pool Wtr Lvl / 5 | | | 01 | | | | Emergency depressurization | 3.5 | 1 |
| 295032 High Secondary Containment Area Temperature / 5 | | | | | | 01, 27 | Knowledge of system purpose and/or function. | 2.8 | 1 |
| 295033 High Secondary Containment Area Radiation Levels / 9 | | | | | | | | | 0 |
| 295034 Secondary Containment Ventilation High Radiation / 9 | | | | | | | | | 0 |
| 295035 Secondary Containment High Differential Pressure / 5 | | | | | | | | | 0 |
| 295036 Secondary Containment High Sump/Area Water Level / 5 | | | | | | | | | 0 |
| 500000 High CTMT Hydrogen Conc. / 5 | | | | | 01 | | Hydrogen monitoring system availability | 3.1 | 1 |
| K/A Category Totals: | 1 | 1 | 1 | 1 | 2 | 1 | Group Point Total: | | 7 |

| ES-401 | BWR Examination Outline<br>Plant Systems - Tier 2/Group 1 (RO) | | | | | | | | | | | Form ES-401-1 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 203000 RHR/LPCI: Injection Mode | | | | | | 07 | | | | 13 | | Plant air systems: Plant-Specific; Suppression pool level/temperature | 2.7; 3.9 | 2 |
| 205000 Shutdown Cooling | | | | | 03 | | | | | | | Heat removal mechanisms | 2.8 | 1 |
| 206000 HPCI | | | | | | | | | | | | | | 0 |
| 207000 Isolation (Emergency) Condenser | | | | | | | | | | | | | | 0 |
| 209001 LPCS | | | 03 | | | | | | | | | Emergency generators | 2.9 | 1 |
| 209002 HPCS | | | | | | | 04 | | | | | Reactor pressure: BWR-5, 6 | 3.3 | 1 |
| 211000 SLC | | | | | | | | | 03 | 08 | | Explosive valves indicating lights: Plant-Specific; System initiation: Plant-Specific | 3.8; 4.2 | 2 |
| 212000 RPS | 03 | | | | | | | | | | | Recirculation system | 3.4 | 1 |
| 215003 IRM | | 01 | | | | | | | | | | IRM channels/detectors | 2.5 | 1 |
| 215004 Source Range Monitor | | | | | | | 04 | | | | | Control rod block status | 3.5 | 1 |
| 215005 APRM / LPRM | | 02 | | | | | | | | | 01 28 | APRM channels: Knowledge of the purpose and function of major system components and controls. | 2.6; 3.2 | 2 |
| 217000 RCIC | | | | 07 | | | | | | | | Alternate supplies of water | 3.6 | 1 |
| 218000 ADS | | | | | | | | 06 | | | | ADS initiation signals present | 4.2 | 1 |
| 223002 PCIS/Nuclear Steam Supply Shutoff | | | 08 | | | | | | | | 01 23 | Reactor vessel temperature; Ability to perform specific system and integrated plant procedures during different modes of plant operation. | 3.4; 3.9 | 2 |
| 239002 SRVs | | | | | | 02 | | | | | | Air (Nitrogen) supply: Plant-Specific | 3.4 | 1 |
| 259002 Reactor Water Level Control | 01 | | | | | | | | | 01 | | RPS: All individual component controllers in the manual mode | 3.8; 3.8 | 2 |
| 261000 SGTS | | | | | | | | | 01 | | | System flow | 3.2 | 1 |
| 262001 AC Electrical Distribution | | | | 01 | | | | | | | | Bus lockouts | 3 | 1 |
| 262002 UPS (AC/DC) | | | | | | | | | 01 | | | Transfer from preferred to alternate source | 2.8 | 1 |
| 263000 DC Electrical Distribution | | 01 | | | | | | | | | | Major D.C. loads | 3.1 | 1 |
| 264000 EDGs | | | | | 05 | | | | | | | Paralleling A.C. power sources | 3.4 | 1 |
| 300000 Instrument Air | | | | | | | | 01 | | | | Air dryer and filter malfunctions | 2.9 | 1 |
| 400000 Component Cooling Water | | | | | | 07 | | | | | | Breakers, relays, and disconnects | 2.7 | 1 |
| | | | | | | | | | | | | | | 0 |
| K/A Category Totals: | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | Group Point Total: | | 26 |

ES-401 BWR Examination Outline Form ES-401-1
Plant Systems - Tier 2/Group 2 (RO)

| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 201001 CRD Hydraulic | | 01 | | | | | | | | | | Pumps | 2.9 | 1 |
| 201002 RMCS | | | | | | | | | | | | | | 0 |
| 201003 Control Rod and Drive Mechanism | | | | 07 | | | | | | | | Maintaining the control rod at a given location | 3.2 | 1 |
| 201004 RSCS | | | | | | | | | | | | | | 0 |
| 201005 RCIS | | | | | | | | | | | | | | 0 |
| 201006 RWM | | | | | | | | | | | | | | 0 |
| 202001 Recirculation | | | | | | | | | | | | | | 0 |
| 202002 Recirculation Flow Control | | | | | | | | | | 01 | | MG sets | 3.3 | 1 |
| 204000 RWCU | | | | 02 | | | | | | | | Piping over-pressurization protection: Plant-Specific | 2.7 | 1 |
| 214000 RPIS | 06 | | | | | | | | | | | RCIS: Plant-Specific | 3.4 | 1 |
| 215001 Traversing In-core Probe | | | | | | | | | | | | | | 0 |
| 215002 RBM | | | | | | | | | | | | | | 0 |
| 216000 Nuclear Boiler Inst. | | | | | | | | | | | | | | 0 |
| 219000 RHR/LPCI: Torus/Pool Cooling Mode | | | | | | | | | | | | | | 0 |
| 223001 Primary CTMT and Aux. | | | | | | | | | | | | | | 0 |
| 226001 RHR/LPCI: CTMT Spray Mode | | | | | | | | | | | | | | 0 |
| 230000 RHR/LPCI: Torus/Pool Spray Mode | | | | | | | | | | | | | | 0 |
| 233000 Fuel Pool Cooling/Cleanup | | | | | | | | | | | | | | 0 |
| 234000 Fuel Handling Equipment | | | | | | | | | | | | | | 0 |
| 239001 Main and Reheat Steam | | | | | | | | | | | | | | 0 |
| 239003 MSIV Leakage Control | | | | | | | | | | | | | | 0 |
| 241000 Reactor/Turbine Pressure Regulator | | | | | | | | 22 | | | | Turbine high vibration | 2.8 | 1 |
| 245000 Main Turbine Gen. / Aux. | | | 08 | | | | | | | | | Reactor/turbine pressure control system: Plant-Specific | 3.7 | 1 |
| 256000 Reactor Condensate | | | | | | | 01 | | | | | System flow | 2.9 | 1 |
| 259001 Reactor Feedwater | | | | | | | | | | | | | | 0 |
| 268000 Radwaste | | | | | | | | | | | | | | 0 |
| 271000 Offgas | | | | | | | | | 01 | | | Automatic system isolations | 3.3 | 1 |
| 272000 Radiation Monitoring | | | | | 01 | | | | | | | Hydrogen injection operation's effect on process radiation indications: Plant-Specific | 3.2 | 1 |
| 286000 Fire Protection | | | | | | | | | | | | | | 0 |
| 288000 Plant Ventilation | | | | | | | | | | | | | | 0 |
| 290001 Secondary CTMT | | | | | | | | | | | 04 50 | Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. | 3.3 | 1 |
| 290003 Control Room HVAC | | | | | | | | | | | | | | 0 |
| 290002 Reactor Vessel Internals | | | | | | 07 | | | | | | RWCU | 2.8 | 1 |
| | | | | | | | | | | | | | | |
| K/A Category Totals: | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | Group Point Total: | | 12 |

| ES-401 | BWR Examination Outline | | | | | | | | Form ES-401-1 |
|---|---|---|---|---|---|---|---|---|---|
| Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO) | | | | | | | | | |
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
| 295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4 | | | | | | | | | 0 |
| 295003 Partial or Complete Loss of AC / 6 | | | | | | | | | 0 |
| 295004 Partial or Total Loss of DC Pwr / 6 | | | | | | | | | 0 |
| 295005 Main Turbine Generator Trip / 3 | | | | | 03 | | Turbine valve position | 3.1 | 1 |
| 295006 SCRAM / 1 | | | | | 03 | | Reactor water level | 4.2 | 1 |
| 295016 Control Room Abandonment / 7 | | | | | 01 | | Reactor power | 4.1 | 1 |
| 295018 Partial or Total Loss of CCW / 8 | | | | | | | | | 0 |
| 295019 Partial or Total Loss of Inst. Air / 8 | | | | | 01 | | Instrument air system pressure | 3.6 | 1 |
| 295021 Loss of Shutdown Cooling / 4 | | | | | | | | | 0 |
| 295023 Refueling Acc / 8 | | | | | | 04, 06 | Knowledge symptom based EOP mitigation strategies. | 4 | 1 |
| 295024 High Drywell Pressure / 5 | | | | | | | | | 0 |
| 295025 High Reactor Pressure / 3 | | | | | | 02, 22 | Knowledge of limiting conditions for operations and safety limits. | 4.1 | 1 |
| 295026 Suppression Pool High Water Temp. / 5 | | | | | | 01, 14 | Knowledge of system status criteria which require the notification of plant personnel. | 3.3 | 1 |
| 295027 High Containment Temperature / 5 | | | | | | | | | 0 |
| 295028 High Drywell Temperature / 5 | | | | | | | | | 0 |
| 295030 Low Suppression Pool Wtr Lvl / 5 | | | | | | | | | 0 |
| 295031 Reactor Low Water Level / 2 | | | | | | | | | 0 |
| 295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1 | | | | | | | | | 0 |
| 295038 High Off-site Release Rate / 9 | | | | | | | | | 0 |
| 600000 Plant Fire On Site / 8 | | | | | | | | | 0 |
| K/A Category Totals: | 0 | 0 | 0 | 0 | 4 | 3 | Group Point Total: | | 7 |

| ES-401 | BWR Examination Outline | | | | | | | | Form ES-401-1 |
|---|---|---|---|---|---|---|---|---|---|
| Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (SRO) | | | | | | | | | |
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic(s) | IR | # |
| 295002 Loss of Main Condenser Vac / 3 | | | | | | | | | 0 |
| 295007 High Reactor Pressure / 3 | | | | | 0 1 | | Reactor pressure | 4.1 | 1 |
| 295008 High Reactor Water Level / 2 | | | | | | | | | 0 |
| 295009 Low Reactor Water Level / 2 | | | | | | | | | 0 |
| 295010 High Drywell Pressure / 5 | | | | | | | | | 0 |
| 295011 High Containment Temp / 5 | | | | | | 04, 30 | Knowledge of which events related to system operations/status should be reported to outside agencies. | 3.6 | 1 |
| 295012 High Drywell Temperature / 5 | | | | | 0 1 | | Drywell temperature | 3.9 | 1 |
| 295013 High Suppression Pool Temp. / 5 | | | | | | | | | 0 |
| 295014 Inadvertent Reactivity Addition / 1 | | | | | | | | | 0 |
| 295015 Incomplete SCRAM / 1 | | | | | | | | | 0 |
| 295017 High Off-site Release Rate / 9 | | | | | | | | | 0 |
| 295020 Inadvertent Cont. Isolation / 5 & 7 | | | | | | | | | 0 |
| 295022 Loss of CRD Pumps / 1 | | | | | | | | | 0 |
| 295029 High Suppression Pool Wtr Lvl / 5 | | | | | | | | | 0 |
| 295032 High Secondary Containment Area Temperature / 5 | | | | | | | | | 0 |
| 295033 High Secondary Containment Area Radiation Levels / 9 | | | | | | | | | 0 |
| 295034 Secondary Containment Ventilation High Radiation / 9 | | | | | | | | | 0 |
| 295035 Secondary Containment High Differential Pressure / 5 | | | | | | | | | 0 |
| 295036 Secondary Containment High Sump/Area Water Level / 5 | | | | | | | | | 0 |
| 500000 High CTMT Hydrogen Conc. / 5 | | | | | | | | | 0 |
| K/A Category Totals: | 0 | 0 | 0 | 0 | 2 | 1 | Group Point Total: | | 3 |

| ES-401 | BWR Examination Outline | | | | | | | | | | | | Form ES-401-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Plant Systems - Tier 2/Group 1 (SRO) | | | | | | | | | | | | |
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 203000 RHR/LPCI: Injection | | | | | | | | | | | | | | 0 |
| 205000 Shutdown Cooling Mode | | | | | | | | | | | | | | 0 |
| 206000 HPCI | | | | | | | | | | | | | | 0 |
| 207000 Isolation (Emergency) Condenser | | | | | | | | | | | | | | 0 |
| 209001 LPCS | | | | | | | | | | | 04. 30 | Knowledge of which events related to system operations/status should be reported to outside agencies. | 3.6 | 1 |
| 209002 HPCS | | | | | | | | | | | | | | 0 |
| 211000 SLC | | | | | | | | | | | | | | 0 |
| 212000 RPS | | | | | | | | | | | | | | 0 |
| 215003 IRM | | | | | | | | 0 1 | | | | Power supply degraded | 3.2 | 1 |
| 215004 Source Range Monitor | | | | | | | | | | | | | | 0 |
| 215005 APRM / LPRM | | | | | | | | | | | | | | 0 |
| 217000 RCIC | | | | | | | | 0 5 | | | | D.C. power loss | 3.3 | 1 |
| 218000 ADS | | | | | | | | | | | | | | 0 |
| 223002 PCIS/Nuclear Steam Supply Shutoff | | | | | | | | | | | 02. 22 | Knowledge of limiting conditions for operations and safety limits. | 4.1 | 1 |
| 239002 SRVs | | | | | | | | | | | | | | 0 |
| 259002 Reactor Water Level Control | | | | | | | | | | | | | | 0 |
| 261000 SGTS | | | | | | | | | | | | | | 0 |
| 262001 AC Electrical Distribution | | | | | | | | 0 5 | | | | Bus grounds | 3.3 | 1 |
| 262002 UPS (AC/DC) | | | | | | | | | | | | | | 0 |
| 263000 DC Electrical Distribution | | | | | | | | | | | | | | 0 |
| 264000 EDGs | | | | | | | | | | | | | | 0 |
| 300000 Instrument Air | | | | | | | | | | | | | | 0 |
| 400000 Component Cooling Water | | | | | | | | | | | | | | 0 |
| | | | | | | | | | | | | | | |
| K/A Category Totals: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 2 | Group Point Total: | | 5 |

| ES-401 | BWR Examination Outline | | | | | | | | | | | | Form ES-401-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Plant Systems - Tier 2/Group 2 (SRO) | | | | | | | | | | | | |
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic(s) | IR | # |
| 201001 CRD Hydraulic | | | | | | | | | | | | | | 0 |
| 201002 RMCS | | | | | | | | | | | | | | 0 |
| 201003 Control Rod and Drive Mechanism | | | | | | | | | | | | | | 0 |
| 201004 RSCS | | | | | | | | | | | | | | 0 |
| 201005 RCIS | | | | | | | | | | | | | | 0 |
| 201006 RWM | | | | | | | | | | | | | | 0 |
| 202001 Recirculation | | | | | | | | | | | | | | 0 |
| 202002 Recirculation Flow Control | | | | | | | | | | | | | | 0 |
| 204000 RWCU | | | | | | | | | | | | | | 0 |
| 214000 RPIS | | | | | | | | | | | | | | 0 |
| 215001 Traversing In-core Probe | | | | | | | | | | | | | | 0 |
| 215002 RBM | | | | | | | | | | | | | | 0 |
| 216000 Nuclear Boiler Inst. | | | | | | | | | | | | | | 0 |
| 219000 RHR/LPCI: Torus/Pool Cooling Mode | | | | | | | | | | | | | | 0 |
| 223001 Primary CTMT and Aux | | | | | | | | 1<br>4 | | | | Low containment to annulus pressure: Mark-III | 3.4 | 1 |
| 226001 RHR/LPCI: CTMT Spray Mode | | | | | | | | 1<br>5 | | | | High containment / drywell pressure | 3.8 | 1 |
| 230000 RHR/LPCI: Torus/Pool Spray Mode | | | | | | | | | | | | | | 0 |
| 233000 Fuel Pool Cooling/Cleanup | | | | | | | | 0<br>3 | | | | Low surge tank level/high level | 3 | 1 |
| 234000 Fuel Handling Equipment | | | | | | | | | | | | | | 0 |
| 239001 Main and Reheat Steam | | | | | | | | | | | | | | 0 |
| 239003 MSIV Leakage Control | | | | | | | | | | | | | | 0 |
| 241000 Reactor/Turbine Pressure Regulator | | | | | | | | | | | | | | 0 |
| 245000 Main Turbine Gen. / Aux. | | | | | | | | | | | | | | 0 |
| 256000 Reactor Condensate | | | | | | | | | | | | | | 0 |
| 259001 Reactor Feedwater | | | | | | | | | | | | | | 0 |
| 268000 Radwaste | | | | | | | | | | | | | | 0 |
| 271000 Offgas | | | | | | | | | | | | | | 0 |
| 272000 Radiation Monitoring | | | | | | | | | | | | | | 0 |
| 286000 Fire Protection | | | | | | | | | | | | | | 0 |
| 288000 Plant Ventilation | | | | | | | | | | | | | | 0 |
| 290001 Secondary CTMT | | | | | | | | | | | | | | 0 |
| 290003 Control Room HVAC | | | | | | | | | | | | | | 0 |
| 290002 Reactor Vessel Internals | | | | | | | | | | | | | | 0 |
| | | | | | | | | | | | | | | |
| K/A Category Totals: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | Group Point Total: | | 3 |

Facility Name: Clinton Power Station Date of Exam: 08/13/2007

| Category | K/A # | Topic | RO | | SRO-Only | |
|---|---|---|---|---|---|---|
| | | | IR | # | IR | # |
| 1. Conduct of Operations | 2.1. 22 | Ability to determine Mode of Operation. | | | 3.3 | 1 |
| | 2.1. 01 | Knowledge of conduct of operations requirements. | 3.7 | 1 | | |
| | 2.1. 16 | Ability to operate plant phone, paging system, and two-way radio. | 2.9 | 1 | | |
| | 2.1. 14 | Knowledge of system status criteria which require the notification of plant personnel. | | | 3.3 | 1 |
| | 2.1. | | | | | |
| | 2.1. | | | | | |
| | Subtotal | | | 2 | | 2 |
| 2. Equipment Control | 2.2. 12 | Knowledge of surveillance procedures. | 3 | 1 | | |
| | 2.2. 27 | Knowledge of the refueling process. | 2.6 | 1 | | |
| | 2.2. 01 | Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity. | 3.7 | 1 | | |
| | 2.2. 18 | Knowledge of the process for managing maintenance activities during shutdown operations. | | | 3.6 | 1 |
| | 2.2. 23 | Ability to track limiting conditions for operations. | | | 3.8 | 1 |
| | 2.2. | | | | | |
| | Subtotal | | | 3 | | 2 |
| 3. Radiation Control | 2.3. 08 | Knowledge of the process for performing a planned gaseous radioactive release. | | | 3.2 | 1 |
| | 2.3. 10 | Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. | 2.9 | 1 | | |
| | 2.3. 02 | Knowledge of facility ALARA program. | 2.5 | 1 | | |
| | 2.3. | | | | | |
| | 2.3. | | | | | |
| | 2.3. | | | | | |
| | Subtotal | | | 2 | | 1 |
| 4. Emergency Procedures / Plan | 2.4. 22 | Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations. | | | 4 | 1 |
| | 2.4. 32 | Knowledge of operator response to loss of all annunciators. | | | 3.5 | 1 |
| | 2.4. 35 | Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications. | 3.3 | 1 | | |
| | 2.4. 27 | Knowledge of fire in the plant procedure. | 3 | 1 | | |
| | 2.4. 01 | Knowledge of EOP entry conditions and immediate action steps. | 4.3 | 1 | | |
| | 2.4. | | | | | |
| | Subtotal | | | 3 | | 2 |
| Tier 3 Point Total | | | | 10 | | 7 |

Facility: Clinton Power Station Scenario No.: 1 Operating Test No.: **ILT0601-1**

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions:
5% power, normal plant startup is in progress.

Turnover:

- Continue plant startup.
- Cross connect 480V Busses C and D with C supplying for a breaker inspection.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | N/A | R-ATC/SRO | Raise reactor power with rods. |
| 2 | ROD0825TFIA4 | C-ATC/SRO | Difficult to Withdraw Control Rod |
| 3 | CW06A | C-BOP/SRO | Auto Trip of 'B' CCW Pump |
| 4 | IRM_CTFIA_1 YP_XREMT_515 | TS-SRO | Downscale failure of IRM C<br>Bypass Div 3 using Sensor Bypass |
| 5 | N/A | N-BOP/SRO | Cross connect 480V Busses C and D |
| 6 | Overrides | TS-SRO | Both OG $H_2$ analyzers lose flow |
| 7 | CD01CD_CD01PATVEFFDEC | C-ATC/SRO | 'A' CD Pump low discharge pressure, must shift pumps. |
| 8 | A05_A02_A14A01_1 | I-BOP/SRO | Failure of the CRD Hydraulic Flow Controller |
| 9 | YP_XMFTB_4068, 4070, 4071 | M-Crew | Trip of all CD pumps |
| 10 | YP_XMFTB_4963 | M-Crew | Failure to scram |
| 11 | YP_XMFTB_5106 & 5107 | C-Crew | Failure of the A SLC Pump to start and a trip of B SLC after one minute of running. |
| | | | |

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

Facility: Clinton Power Station Scenario No.: 2 Operating Test No.: **ILT0601-1**

Examiners: _____ Operators: _____

Initial Conditions:
80% power, steady state.
MDRFP is CO for coupling replacement.

Turnover:
- Perform 9064.01 Drywell Post-LOCA Vacuum Breaker Verification Test.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | YPCTHOLE H_A06_DS1_00_1 H_A06_DS1_08_1 | N-BOP/SRO TS-SRO | Perform 9064.01 Drywell Post-LOCA Vacuum Breaker Verification Test - Fails |
| 2 | A05_A02_A0707_3_TVM H_A05_A21DS54_1 | C-BOP/SRO | Loss of Lube Oil pressure on the B CRD Pump and a failure of the pump to trip. |
| 3 | ROD2029TFIA6 ROD3237TFIA6 | TS-SRO | Two Accumulator Faults |
| 4 | ROD2421TFIA8 | C-ATC/SRO | Control Rod Drift |
| 5 | YP_XMFTB_5079 | C-BOP/SRO | The B FC pump trips |
| 6 | A01_A03_02_5_TVM YP_RR23A | R-ATC/SRO | Intermittent Low Pressure RFP B Seal Water Alarm. Reduce power with Reactor Recirc to allow removal of RFP B from service. |
| 7 | Override | C-ATC/SRO | Turbine trip Pushbutton fails during removal of the B RFP from service. |
| 8 | YPXMALSE_527 | M-Crew | Small break LOCA requiring an Emergency Depressurization. |
| 9 | YPXMALSE_74 | C-Crew | ADS Valve F041C fails to open |
| | | | |

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

Facility: Clinton Power Station Scenario No.: 3 Operating Test No.: **ILT0601-1**

Examiners: _____ Operators: _____

Initial Conditions:
95% power, steady state.
MDRFP is CO for coupling replacement.

Turnover:

- A VG is running for CPS 9067.01 and is ready to be shut down.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | YPXMALSE_5 | C-ATC/SRO | The A RWCU F/D resin release |
| 2 | N/A | N-BOP/SRO | Shutdown VG |
| 3 | A05_A02_A0203_1_TVM | C-BOP<br>TS-SRO | RCIC failure to Auto isolate on an Isolation signal |
| 4 | YVMSAVLK_17 | I-BOP/SRO | Steam Seal Header Pressure Control Valve Failure |
| 5 | YP_XMFTB_4966 | C-ATC/SRO<br>TS-SRO | RR Pump B trip to off |
| 6 | N/A | R-ATC/SRO | Reduce power to ~40% with Control Rods |
| 7 | A03_A03_02_1_TVM<br>A03_A03_02_2_TVM<br>A03_A03_03_1_TVM<br>HPAKFUSE_H892705CC<br>Overrides | M-Crew | Earthquake<br>HPCS Injection Valve Breaker trips.<br>The RR suction isolation valve Breaker trips. |
| 8 | YAFWL91 | M- Crew | Leak at A TDRFP discharge |
| 9 | YPXMALSE_530<br>YPXMALSE_531<br>YPXMALSE_510 | M- Crew | The B RR Pump seals and bushing fail |
| | | | |

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

REGION III HAD NO COMMENTS TO THE EXAM OUTLINE SUBMITTAL

FOR THE CLINTON POWER STATION INITIAL EXAMINATION - AUGUST 2007