| ES-201 | Examination Preparation Checklist | Form ES-201-1 |
|---|---|---|

Facility: **Browns Ferry** Date of Examination: **11/16/2015**

Developed by: Written: Facility [X] NRC [ ] // Operating Facility [X] NRC [ ]

| Target Date* | | Task Description (Reference) | Chief Examiner's Initials |
|---|---|---|---|
| -180 | 1. | Examination administration date confirmed (C.1.a; C.2.a and b) | |
| -150 | 2. | NRC examiners and facility contact assigned (C.1.d; C.2.e) | |
| -150 | 3. | Facility contact briefed on security and other requirements (C.2.c) | |
| -150 | 4. | Corporate notification letter sent (C.2.d) | |
| [-120] | 5. | Reference material due (C.1.e; C.3.c; Attachment 3) | |
| {-90} | 6. | Integrated examination outline(s) due, including Forms ES-201-2, ES-201-3, ES-301-1, ES-301-2, ES-301-5, ES-D-1, ES-401-1/2, ES-401N-1/2, ES-401-3, ES-401N-3, ES-401-4, and ES-401N-4, as applicable (C.1.e and f; C.3.d) | |
| {-85} | 7. | Examination outline(s) reviewed by NRC and feedback provided to facility licensee (C.2.h; C.3.e) | |
| {-60} | 8. | Proposed examinations (including written, walk-through JPMs, and scenarios, as applicable), supporting documentation (including Forms ES-301-3, ES-301-4, ES-301-5, ES-301-6, and ES-401-6, ES-401N-6, and any Form ES-201-2, ES-201-3, ES-301-1, or ES-301-2 updates), and reference materials due (C.1.e, f, g and h; C.3.d) | |
| -45 | 9. | Written exam and operating test reviews completed. (C.3.f) | |
| -30 | 10. | Preliminary license applications (NRC Form 398's) due (C.1.l; C.2.g; ES-202) | |
| -21 | 11. | Examination approved by NRC supervisor for facility licensee review (C.2.h; C.3.f) | |
| -21 | 12. | Examinations reviewed with facility licensee (C.1.j; C.2.f and h; C.3.g) | |
| -14 | 13. | Final license applications due and Form ES-201-4 prepared (C.1.l; C.2.i; ES-202) | |
| -14 | 14. | Written examinations and operating tests approved by NRC supervisor (C.2.i; C.3.h) | |
| -7 | 15. | Facility licensee management queried regarding the licensee's views on the examination. (C.2 j) | |
| -7 | 16. | Final applications reviewed; 1 or 2 (if >10) applications audited to confirm qualifications / eligibility; and examination approval and waiver letters sent (C.2.i; Attachment 5; ES-202, C.2.e; ES-204) | |
| -7 | 17. | Proctoring/written exam administration guidelines reviewed with facility licensee (C.3.k) | |
| -7 | 18. | Approved scenarios, job performance measures, and questions distributed to NRC examiners (C.3.i) | |

* Target dates are generally based on facility-prepared examinations and are keyed to the examination date identified in the corporate notification letter. They are for planning purposes and may be adjusted on a case-by-case basis in coordination with the facility licensee.
[Applies only] {Does not apply} to examinations prepared by the NRC.

Facility: BFN Date of Examination: 11-16-15

| Item | Task Description | Initials a | Initials b* | Initials c# |
|---|---|---|---|---|
| 1. WRITTEN | a. Verify that the outline(s) fit(s) the appropriate model, in accordance with ES-401 or ES-401N. | | | |
| | b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 or ES-401N and whether all K/A categories are appropriately sampled. | | | |
| | c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics. | | | |
| | d. Assess whether the justifications for deselected or rejected K/A statements are appropriate. | | | |
| 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. | | | |
| | 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 that scenarios will not be repeated on subsequent days. | | | |
| | 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. | | | |
| 3. WALK THROUGH | 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. | | | |
| | 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 | | | |
| | 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. | | | |
| 4. GENERAL | a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam sections. | | | |
| | b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate. | | | |
| | c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5. | | | |
| | d. Check for duplication and overlap among exam sections. | | | |
| | e. Check the entire exam for balance of coverage. | | | |
| | f. Assess whether the exam fits the appropriate job level (RO or SRO). | | | |

| | Printed Name/Signature | Date |
|---|---|---|
| a. Author | MICHAEL BARTON | 10-30-15 |
| b. Facility Reviewer (*) | Keith Nichols | 10/30/15 |
| c. NRC Chief Examiner (#) | Joseph Viera / Philip Capehart | 11/9/15 |
| d. NRC Supervisor | Gerald McCoy | 11/10/2015 |

Note: # Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.
* Not applicable for NRC-prepared examination outlines.

## 1. Pre-Examination

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## 2. Post-Examination

To the best of my knowledge, I did not divulge to any unauthorized persons any information concerning the NRC licensing examinations administered during the week(s) of 11-16-15. From the date that I entered into this security agreement until the completion of examination administration, I did not instruct, evaluate, or provide performance feedback to those applicants who were administered these licensing examinations, except as specifically noted below and authorized by the NRC.

| | PRINTED NAME | JOB TITLE / RESPONSIBILITY | SIGNATURE (1) | DATE | SIGNATURE (2) | DATE | NOTE |
|---|---|---|---|---|---|---|---|
| 1. | Nathan Cooper | Reactor Operator | | 8/21/15 | | 12/2/15 | |
| 2. | Michael S Brooks | SRO | | 8/25/15 | | 12/7/15 | |
| 3. | Jacob H Adams | RO | | 8/27/15 | | 12/7/15 | |
| 4. | Bradley S Sager | Reactor Operator | | 8/28/15 | | 11/30/15 | |
| 5. | Wesley M Conkle | SRO | | 8/29/15 | | 12/2/15 | |
| 6. | Gregory L Smith | SM / SRO | | 9-2-15 | | 2-16-16 | ← |
| 7. | Todd A Bhanan | SRO | | 9/2/15 | | 12/4/15 | |
| 8. | Kenneth Stephenson | RO | | 9/2/15 | | 12/1/15 | |
| 9. | MATTHEW SLOUKA | SRO | | 9/2/15 | | 12/14/15 | |
| 10. | MICHAEL SCHULTE | OPS TRNG | | 9/2/15 | | 11/25/15 | |
| 11. | JOHN HOLLIDAY | SRO | | 9/4/15 | | 12/14/15 | |
| 12. | ADAM CROSS | SRO | | 9/4/15 | | 12/7/15 | |
| 13. | Eric Steele | SRO | | 9/3/15 | | 12/7/15 | |
| 14. | Chris L Vaughn | Ops Trng Mgr | | 9/2/15 | | 11/30/15 | |
| 15. | Chris V. Winton | RO | | 9-11-15 | | 1-11-16 | |

NOTES:

**ES-201** **Examination Security Agreement** **Form ES-201-3**

## 1. Pre-Examination

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## 2. Post-Examination

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| | PRINTED NAME | JOB TITLE / RESPONSIBILITY | SIGNATURE (1) | DATE | SIGNATURE (2) | DATE | NOTE |
|---|---|---|---|---|---|---|---|
| 1. | DANIEL P NEWTON | I+C SIMSERV. | | 6/19/15 | | 11/30/2015 | |
| 2. | ARDIE R Champion | Sim Serv | | 6/19/15 | | 12/3/15 | |
| 3. | Rick L. Fusek | Reactor Operator | | 7/17/15 | | 12/4/15 | |
| 4. | Emily J. Cole | Senior Reactor Operator | | 7/22/15 | | 11/24/15 | |
| 5. | [illegible] | [illegible] | | 7/23/15 | COPY SIGNED SEE ATTACHED | 11/24/15 | |
| 6. | Matthew R Humphries | Reactor Operator | | 8/12/15 | | 11/22/16 | |
| 7. | Timothy Andrews | Senior Reactor Operator | | 8/13/15 | | 12/7/15 | N/A |
| 8. | Jason Miller | Reactor Operator | | 8/14/15 | | 12/8/15 | |
| 9. | JEREMY D TAYLOR | REACTOR OPERATOR | | 8/19/15 | | 11/30/15 | |
| 10. | Robert Welchans | Unit Supervisor | | 8/19/15 | | 11-30-15 | |
| 11. | Nathan L Metcalf | Reactor Operator | | 8/19/15 | | 11/30/15 | |
| 12. | Mike Blakely | Reactor Operator | | 8/19/15 | | 11/30/15 | |
| 13. | Andrew Mitchell | Senior Reactor Operator | | 8/19/15 | | 11/30/15 | |
| 14. | Brandon Shilly | Reactor Operator | | 8-19-15 | | 11-30-15 | |
| 15. | Matt Hester | Reactor operator | | 9/21/15 | | 12/7/15 | |

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1. **Pre-Examination**

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|---|---|---|---|---|---|---|---|
| 1. | DANIEL P WEAVER | ITC SIMSERV | | 6/19/15 | | NA | NA |
| 2. | AZDIE K CHAMPION | SIM SERV | | 6/19/15 | NA | | |
| 3. | RICK L. FUSSELL | Reactor Operator | | 7/17/15 | NA | | |
| 4. | MICHAEL J. COLE | Senior Reactor Operator | | 7/23/15 | | 11/10/15 | |
| 5. | [illegible] | [illegible] | | 7/23/15 | | 11/24/15 | |
| 6. | ROMAN BECKER | Industry Peer - MNGP | | 8-12-15 | | 12-14-15 | COPY FOR ROMAN BECKER'S SIGNATURE. |
| 7. | DILLAN FISHER | SRO | | 9-21-15 | | 11/24/15 | |
| 8. | DONALD L. BINKLEY | ILT SIMULATOR | | 11/12/15 | | 11/24/15 | |
| 9. | [illegible] | ILT INSTRUCTOR | | 11/16/15 | | 11/24/15 | |
| 10. | MARCUS S. HAMMETT | ILT INSTRUCTOR | | 11/16/15 | | 11/24/15 | |
| 11. | RICKY CIVENS | ILT INSTRUCTOR | | 11-16-15 | | 11-24-15 | |
| 12. | ROGER BOND | ILT INSTRUCTOR | | 11-16-15 | | 11-24-15 | |
| 13. | [illegible] | ILT INSTRUCTOR | | 11/16/15 | | 11/24/15 | |
| 14. | DOUGLAS J PRICE | ILT Instructor | | 11/16/15 | | 11/24/15 | |
| 15. | ASHLEY S. FERN | ILT Instructor | | 11/16/15 | | 11/24/15 | |

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|---|---|---|---|---|---|---|---|
| 1. | BILLY MILLSAPS | UO | | 9/15/15 | | 12/2/15 | N/A |
| 2. | SEAN K. BRANFORD | Ops Instructor | | 9-15-15 | | 11-24-15 | |
| 3. | Ashley S. Pettit 9/15/15 MA | U NA | | N/A | | N/A | N/A |
| 4. | JAMES KARNES | UO | | 9/15/15 | | 12/3/15 | |
| 5. | Tim Patterson | UO | | 9-15-15 | | 12-7-15 | N/A |
| 6. | Joseph Higgins | UO | | 9/15/15 | | 1/4/16 | |
| 7. | JON HEUGEL | US | | 9-15-15 | | 1-11-16 | |
| 8. | Don Owen | UO | | 9-15-15 | | 12/2/15 | |
| 9. | David Hall | US | | 9-15-15 | | 2-15-16 | |
| 10. | Jenny Campbell | OPS Supt. | | 9/16/15 | | 11/30/15 | N/A |
| 11. | MONTE McANDREW | OPS DIRECTOR | | 10/8/15 | | 12/2/15 | N/A |
| 12. | DOUGLAS WILSON | US | | 10/14/15 | | 2/11/16 | |
| 13. | CW Johnson | UO | | 10-18-16 | | 2-11-16 | N/A |
| 14. | NEEL SHUKLA | US | | 10/27/15 | | 12/1/15 | N/A |
| 15. | BEN HODGES | UO | | 10/28/15 | | 11/24/15 | |

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| | PRINTED NAME | JOB TITLE / RESPONSIBILITY | SIGNATURE (1) | DATE | SIGNATURE (2) | DATE | NOTE |
|---|---|---|---|---|---|---|---|
| 1. | William H Reed | Instructor ILT | | 11/16/15 | | 11/23/15 | |
| 2. | MICHAEL C. THARPE | INSTRUCTOR ILT | | 11/16/15 | | 11/24/15 | |
| 3. | RICHARD A. EVANS | INSTRUCTOR ILT | | 11/16/15 | | 11/30/15 | |
| 4. | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 5. | | | | | | | |
| 6. | | | | | | | |
| 7. | | | | | | | |
| 8. | | | | | | | |
| 9. | | | | | | | |
| 10. | | | | | | | |
| 11. | | | | | | | |
| 12. | | | | | | | |
| 13. | | | | | | | |
| 14. | | | | | | | |
| 15. | | | | | | | |

NOTES:

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| | PRINT NAME | JOB TITLE / RESPONSIBILITY | SIGNATURE(1) | DATE | SIGNATURE (2) | DATE | NOTE |
|---|---|---|---|---|---|---|---|
| 1. | Michael Barton | Lead Examination Developer | | 3-4-15 | | 11-25-15 | |
| 2. | Scott Bohling | Lead Exam Dev Under Inst. | | 3/4/15 | | 11-25-15 | |
| 3. | Keith Nichols | Exam Developer | | 3/4/15 | | 11/24/15 | |
| 4. | Dale Hill | Exam Developer | | 3/4/15 | | 12/2/15 | |
| 5. | TERRY RUNNELS | LOR EXAM DEVELOPER | | 3/31/15 | | 11/24/15 | |
| 6. | Russell Joplin | Corp EXAM MGR | | 4/15/15 | COPY SIGNED AND FAXED BACK | 1-11-16 | |
| 7. | Charles Epperson | OPS IT | | 4/15/15 | | 12/1/15 | |
| 8. | ~~Ronald L Forster~~ | ~~QA OPS Audit~~ | | 4/22/15 | N/A | N/A | N/A |
| 9. | Hal Higgins | Ops Trng Supv | | 4/29/15 | | 12/3/15 | N/A |
| 10. | Ken N Miller | Sim Serv | | 5/4/15 | | 11/24/15 | |
| 11. | Daniel M Smith | Sim Svcs | | 5-4-15 | | 12/01/15 | |
| 12. | David McConnell | OPS TRNG LOR | | 5/19/15 | | 11/24/15 | |
| 13. | Thomas S. Albright | Sim SVS. | | 6/17/15 | | 11/24/15 | |
| 14. | Chris L Berryman | SIM SVS | | 6/17/2015 | | 11/30/2015 | |
| 15. | Patrick J Arnold | Sim Svc. | | 6/19/15 | | 11/30/15 | |

NOTES #8 RONALD FORSTER DID NOT SEE ANY ILT MATERIAL AND LINED THROUGH HIS SIGNATURE.

1. **Pre-Examination**

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| 2. | Scott Bohling | Lead Exam Dev Under Inst. | | 3/4/15 | | 11-25-15 | |
| 3. | Keith Nichols | Exam Developer | | 3/4/15 | | 11/24/15 | |
| 4. | Dale Hill | Exam Developer | | 3/4/15 | | 12/2/15 | |
| 5. | TERRY RUNNELS | LOR EXAM DEVELOPER | | 3/31/15 | | 11/24/15 | |
| 6. | Russell Joplin | Corp EXAM MGR | | 4/15/15 | | 1/11/16 | |
| 7. | Charles Depuy | OPS IT | | 4/15/15 | | 12/1/15 | |
| 8. | ~~Ronald Forster~~ | ~~QA OPS Audit~~ | | ~~4/15/15~~ | N/A | N/A | N/A |
| 9. | Hal Higgins | Ops Exam Supv | | 4/29/15 | | 12/3/15 | N/A |
| 10. | Ian N Miller | Sim Serv | | 5/4/15 | | 11/24/15 | |
| 11. | Darren M Simms | Sim Svcs | | 5-4-15 | | 12/01/15 | |
| 12. | David McConnell | OPSTRNG LOR | | 5/19/15 | | 11/24/15 | |
| 13. | Thomas S. Albright | Sim Svs. | | 6/17/15 | | 11/24/15 | |
| 14. | [illegible] | SIM SVS | | 6/17/15 | | 11/20/2015 | |
| 15. | Patrick J Arundi | Sim Svc | | 6/19/15 | | 11/30/15 | |

NOTES #8 RONALD FORSTER DID NOT SEE ANY ILT MATERIAL AND LINED THROUGH HIS SIGNATURE.

Facility: Browns Ferry NPP Date of Examination: 11/16/2015

Examination Level: RO Operating Test Number: 15-10

| Administrative Topic (see Note) | Type Code* | Describe activity to be performed |
|---|---|---|
| Conduct of Operations - 1 | D,R | JPM - 557 Placing an RPS Channel in Trip |
| Conduct of Operations - 2 | M,R | JPM - 516 Calculate Four Doublings |
| Equipment Control | D,R | JPM – 680 Perform Jet Pump Mismatch And Operability |
| Radiation Control | N,R | JPM - 682 Review a Radiation Work Permit |

**NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.**

* Type Codes & Criteria:
(C)ontrol Room, (S)imulator, Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs and RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)
(S)imulator

# Reactor Operator

## Conduct of Operation

1. JPM – 557 Title: Placing an RPS Channel in Trip
   Description: Given Turbine Stop Valve #3 limit switches failed the surveillance 3-SR-3.3.1.1.14(8I) Turbine Stop Valve Closure - RPS Trip (Channel A1/A2) and RPT Trip (System A & B) Logic System Functional Test. The RO is going to determine the correct number and location of the RPS Fuses to remove to place the channel in the tripped condition. The task is completed when both fuses are identified in to 3-OI-99 Reactor Protection System. A hard copy of 3-OI-99 will be provided.
   K/A: 2.1.25; Ability to interpret reference materials, such as graphs, curves, tables, etc.

2. JPM – 516 Title: Calculate Four Doublings
   Description: Provided initial SRM reading the student will calculate 4 doubling and with that information determine if notch withdrawal is required.
   K/A: 2.1.37; Knowledge of procedures, guidelines, or limitations associated with reactivity management.

## Equipment Control

1. JPM – 680 Title: Perform Jet Pump Mismatch and Operability SR (Alternate Path)
   Description: Provided with Jet Pump Instrument reading and a copy of the surveillance, the RO is going to determine 2-SR-3.4.2.1, Jet Pump Mismatch and Operability is not met for Jet Pump 15.
   K/A: 2.2.12; Knowledge of surveillance procedures.

## Radiation Control

1. JPM – 682 Title: Review a Radiation Work Permit
   Description: Provided an RWP and dose rate information, determine if the work in the area can be completed without exceeding exposure limits. The Candidate has to know personal dose limits and how to interpret RWP dose requirements to correctly answer the questions in the JPM.
   K/A: 2.3.7; Ability to comply with radiation work permit requirements during normal or abnormal conditions.

Facility: Browns Ferry NPP Date of Examination: 11/16/2015

Examination Level: SRO Operating Test Number: 15-10

| Administrative Topic (see Note) | Type Code * | Describe activity to be performed |
|---|---|---|
| Conduct of Operations | M,R | JPM – 678 Shift Staffing - SRO |
| Conduct of Operations | N,R | JPM – 677 Fuel Handling / fuel storage, determine compliance with guidelines. |
| Equipment Control | M,R | JPM – 676 Review Completed SR (SRO) |
| Radiation Control | N,R | JPM - 682 Review a Radiation Work Permit |
| Emergency Plan | M,R | JPM – 679 Upgrade PAR on wind shift. |

**NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.**

* Type Codes & Criteria:
(C)ontrol Room, (S)imulator, Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs and RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)
(S)imulator

# Senior Reactor Operator

**Conduct of Operation**

1. JPM – 678 Title: Shift Staffing - SRO
   Description: Provided with a crew complement, the SRO determines if his staff meets the minimum shift requirements. The list of people appears to be below the minimum; however an SRO can be moved down to an RO position to fill the Crew Complement. The Emergency Responder position is also down one, so a callout is required.
   K/A: 2.1.4 Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, “no-solo” operation, maintenance of active license status, 10CFR55, etc.

2. JPM – 677 Title: Fuel Handling fuel storage, determines compliance with guidelines.
   Description: Provided with Nuclear Fuel Storage physical locations and configurations, the SRO must determine if the fuel is being stored within the guidance of the procedure. In this case there are new fuel bundles stored in locations that are not allowed.
   K/A: 2.1.35 Knowledge of the fuel-handling responsibilities of SROs.

**Equipment Control**

1. JPM – 676 Title: Review Completed SR (SRO)
   Description: Provided a completed SR-3.4.2.1 that the Unit Operator completed on his shift, the SRO is to review the SR for completeness and accuracy. The SR is filled out incorrectly and identified as meeting the surveillance requirements, however the surveillance requirements are not met and the SRO must identify that and determine the correct LCO.
   K/A: 2.2.22; Knowledge of limiting conditions for operations and safety limits

**Radiation Control**

1. JPM – 682 Title: Review a Radiation Work Permit
   Description: Provided an RWP and dose rate information, determine if the work in the area can be completed without exceeding exposure limits. The Candidate has to know personal dose limits and how to interpret RWP dose requirements to correctly answer the questions in the JPM.
   K/A: 2.3.7; Ability to comply with radiation work permit requirements during normal or abnormal conditions.

**Emergency Plan**

1. JPM – 679 Title: Upgrade PAR on wind shift (SRO)
   Description: Provided an EPIP-5 General Emergency declaration form and new information about meteorological conditions determine that the PAR needs to be adjusted to include a new sector for sheltering. That will require the SRO to fill out another form with the new information.
   K/A: 2.4.44; Knowledge of emergency plan protective action recommendations

Facility: Browns Ferry NPP Date of Examination: 11/16/2015

Exam Level: ☒ RO ☐ SRO-I ☐ SRO-U Operating Test No.: 15-10

| 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. | JPM 80A | Respond to a Control Rod Drift In. IAW AOI-85-5 | A,D,S | 1 |
| b. | JPM 276 | EHC Auto Cooldown | D,L,S | 4 |
| c. | JPM 672A | Loss Of Reference APRM To Rod Block Monitor (RBM) | A,N,S | 7 |
| d. | JPM 257A | EOI Appendix-6E Injection Subsystem Lineup CS System II | A,M,EN,L,S | 2 |
| e. | JPM 670A | EOI Appendix-11F Alternate RPV Pressure Control Systems: RFPT On Minimum Flow | A,M S | 3 |
| f. | JPM 669 | EOI-Appendix-14A N2 Makeup To Primary Containment | N,S | 5 |
| g. | JPM 631 | Restore Offsite Power to 4KV shutdown board at PNL 9-23 | D,P,S | 6 |
| h. | JPM 190 | Respond to Off-Gas Post-Treatment Radiation HI-HI-HI (RO Only) | A,M,P,S | 9 |
| **In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)** | | | | |
| i. | JPM 673 | Automatic Start Failure of A & C Fire Pumps | E,N | 8 |
| j. | JPM 674 | Aligning Emergency EECW Makeup To Spent Fuel Pool | E,N,R | 9 |
| k. | JPM 307 | Start up and synchronize Unit 3 Preferred MMG Set | D | 6 |

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

| * Type Codes | Criteria for RO / SRO-I / SRO-U |
|---|---|
| (A)lternate path | 4-6/4-6/2-3 |
| (C)ontrol room | |
| (D)irect from bank | ≤ 9/≤ 8/≤4 |
| (E)mergency or abnormal in-plant | ≥ 1/≥ 1/≥1 |
| (EN)gineered safety feature | ≥1/≥1/≥1 (control room system) |
| (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 | |

**Reactor Operator**

**Job Performance Measures**

a. JPM 80A Title: Respond to a Control Rod Drift In. IAW AOI-85-5
Description: While performing Surveillance 3.1.3.3, Control Rod Exercise Test for partially withdrawn control rods the ATC Operator will respond to a single control rod drift per AOI-85-5, Rod Drift In. as he continues with the surveillance multiple control rods will begin to drift in and the ATC Operator will respond by inserting a manual scram per AOI-85-5, Rod Drift In. Once scram report is given the JPM will end.

K/A: 201002 Reactor Manual Control System A2.02; Ability to (a) predict the impacts of the following on the REACTOR MANUAL CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Rod Drift Alarm

b. JPM 276 Title: EHC Auto Cooldown
Description: The BOP Operator will commence a cooldown of the reactor plant to 20 psig utilizing Main Turbine Bypass Valves with EHC Auto Cooldown function per OI-47, Turbine-Generator System. Once the initial cooldown has commenced the US will direct the BOP Operator to adjust the setpoint to 100 psig. After setpoint has been changed the JPM will end.

K/A: 239001Main and Reheat Steam System: A4.09 Ability to manually operate and/or monitor in the control room: Reactor pressure

c. JPM 672A Title: Loss Of Reference APRM To Rod Block Monitor (RBM)
Description: The ATC Operator will begin raising reactor power to achieve 40% per Control Rod Movement Data Sheet for placing Feedwater Heaters and Moisture Separator Drain System in service. As reactor power is raised, APRM Ch 2 will fail downscale and impose a Control Rod Withdrawal Block which requires the APRM to be bypassed, to allow control rod movement. Once the Control Rod Withdrawal Block is cleared, and rod movement has continued, the JPM will end.

K/A: 215002 Rod Block Monitor System A2.03; Ability to (a) predict the impacts of the following on the ROD BLOCK MONITOR SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of associated reference APRM channel: BWR-3,4,5

**Reactor Operator**

**Job Performance Measures**

d. JPM 257A Title: EOI Appendix-6E Injection Subsystem Lineup CS System II
Description: The ATC Operator has been directed to inject water into the RPV and restore water level using Core Spray System II per EOI-Appendix-6E, Injection Subsystems Lineup Core Spray System II. The operator will determine that FCV-75-51, CORE SPRAY SYS II OUTBD INJECT VALVE and FCV-75-53, CORE SPRAY SYS II INBD INJECT VALVE are not in proper alignment. Once the alignment is corrected, injection flow to RPV is established and reactor water level is > TAF (-162 in) the JPM will end.

K/A: 209001 Low Pressure Core Spray System A4.08 Ability to manually operate and/or monitor in the control room: Reactor water level

e. JPM 670A Title: EOI Appendix-11F Alternate RPV Pressure Control Systems: RFPT On Minimum Flow
Description: The BOP Operator has been directed to lower reactor pressure to 800 – 1000 psig by placing A RFPT in Alternate Pressure Control per EOI-Appendix-11F. As speed reaches 350 RPM the A RFPT will trip and require the operator to start B RFPT for pressure control. Once 2B RFPT is in service and reactor pressure is lowering the JPM will end.

K/A: 239001 Main and Reheat Steam System A1.01 Ability to predict and/or monitor changes in parameters associated with operating the MAIN AND REHEAT STEAM SYSTEM controls including: Main steam pressure

f. JPM 669 Title: EOI-Appendix-14A N2 Makeup To Primary Containment
Description: The BOP Operator has been directed to lower Drywell Hydrogen Concentration per EOI-Appendix-14A. The operator will need to determine that Drywell Hydrogen Concentration is greater than Suppression Chamber Hydrogen Concentration and begin purging the Drywell. Once Drywell Hydrogen Concentration begins to lower the JPM will end.

K/A: 223001 Primary Containment System and Auxiliaries A2.04**;** Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High containment/drywell hydrogen concentration

## Reactor Operator

### Job Performance Measures

g. JPM 631 Title: Restore Offsite Power to 4KV shutdown board at PNL 9-23
Description: The BOP Operator has been directed to restore offsite power to 4KV Shutdown Board IAW 0-OI-82. The operator will parallel offsite to the running Diesel Generator, Once the Diesel Generator is separated from the grid the JPM will end.

K/A: 262001 A.C. Electrical Distribution; A4.02 Ability to manually operate and/or monitor in the control room: Synchroscope, including understanding of running and incoming voltages

h. JPM 190 Title: Respond to Off-Gas Post-Treatment Radiation HI-HI-HI(RO Only)
Description: The BOP Operator will respond to OFF-GAS POST TREATMENT RADIATION HI-HI-HI annunciator. The operator will close FCV-66-28, OFF-GAS SYSTEM ISOLATION VALVE and then perform immediate actions of AOI-66-2, Off-gas Post-treatment Radiation Hi-Hi-Hi. The operator will reduce core flow to 50-60% and then insert a manual reactor scram. The operator will continue with subsequent actions. Once the standby Stack Dilution fan is started the JPM will end.

K/A: 271000 Offgas System: A2.16; Ability to (a) predict the impacts of the following on the OFFGAS SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of offgas system loop seals (2.9/3.2)

i. JPM 673A Title: Automatic Start Failure of A & C Fire Pumps
Description: The Operator has been directed to start A and C Electric Fire Pumps per 0-OI-26, High Pressure Fire Protection System from the 4KV Shutdown Boards. The operator will start A and C Fire Pumps from their local breaker cubicles. Once both fire pumps have been started the JPM will end.

K/A: 286000 Fire Protection System A2.08; Ability to (a) predict the impacts of the following on the FIRE PROTECTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Failure to actuate when required

**Reactor Operator**

**Job Performance Measures**

j. JPM 674 Title: Aligning Emergency EECW Makeup To Spent Fuel Pool
Description: The Operator has been directed to align EECW Makeup to Unit 2 Spent Fuel Pool per 2-AOI-78-1 Attachment 2. The operator will locate and align EECW to Spent Fuel Pool by utilizing fire hoses and isolation valves. Once the lineup is made and water is flowing into the Spent Fuel Pool the JPM will end.

K/A: 233000 Fuel Pool Cooling and Clean-up; A2.02; Ability to (a) predict the impacts of the following on the FUEL POOL COOLING AND CLEAN-UP; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Low pool level

k. JPM 307 Title: Start up and synchronize Unit 3 Preferred MMG Set
Description: The Operator has been directed to synchronize the Unit 3 Unit Preferred MMG Set per 0-OI-57C. The operator will perform local operations to synchronize U3 MMG set to the Battery Board. Once Unit 3 MMG Set has been transferred per 0-OI-57C the JPM will end.

K/A: 262002 Uninterruptable Power Supply (A.C./D.C.) A1.02; Ability to predict and/or monitor changes in parameters associated with operating the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) controls including: Motor generator outputs

Facility: Browns Ferry NPP Date of Examination: 11/16/2015

Exam Level: ☐ RO ☒ SRO-I ☐ SRO-U Operating Test No.: 15-10

| 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. | JPM 80A | Respond to a Control Rod Drift In. IAW AOI-85-5 | A,D,S | 1 |
| b. | JPM 276 | EHC Auto Cooldown | D,L,S | 4 |
| c. | JPM 672A | Loss Of Reference APRM To Rod Block Monitor (RBM) | A,N,S | 7 |
| d. | JPM 257A | EOI Appendix-6E Injection Subsystem Lineup CS System II | A,M,EN,L,S | 2 |
| e. | JPM 670A | EOI Appendix-11F Alternate RPV Pressure Control Systems: RFPT On Minimum Flow | A,M S | 3 |
| f. | JPM 669 | EOI-Appendix-14A N2 Makeup To Primary Containment | N,S | 5 |
| g. | JPM 631 | Restore Offsite Power to 4KV shutdown board at PNL 9-23 | D,P,S | 6 |
| | | | | |
| **In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)** | | | | |
| i. | JPM 673 | Automatic Start Failure of A & C Fire Pumps | E,N | 8 |
| j. | JPM 674 | Aligning Emergency EECW Makeup To Spent Fuel Pool | E,N,R | 9 |
| k. | JPM 307 | Start up and synchronize Unit 3 Preferred MMG Set | D | 6 |

* 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<br>(C)ontrol room<br>(D)irect from bank<br>(E)mergency or abnormal in-plant<br>(EN)gineered safety feature<br>(L)ow-Power / Shutdown<br>(N)ew or (M)odified from bank including 1(A)<br>(P)revious 2 exams<br>(R)CA<br>(S)imulator | 4-6/4-6/2-3<br><br>≤ 9/≤ 8/≤4<br>≥ 1/≥ 1/≥1<br>≥1/≥1/≥1 (control room system)<br>≥1/≥1/≥1<br>≥ 2/≥ 2/≥1<br>≤ 3/≤ 3/≤ 2 (randomly selected)<br>≥1/≥1/≥1 |

## Senior Reactor Operator Instant

### Job Performance Measures

a. JPM 80A Title: Respond to a Control Rod Drift In. IAW AOI-85-5
Description: While performing Surveillance 3.1.3.3, Control Rod Exercise Test for partially withdrawn control rods, the ATC Operator will respond to a single control rod drift per AOI-85-5, Rod Drift In. As he continues with the surveillance, multiple control rods will begin to drift in and the ATC Operator will respond by inserting a manual scram per AOI-85-5, Rod Drift In. Once scram report is given the JPM will end.

K/A: 201002 Reactor Manual Control System A2.02; Ability to (a) predict the impacts of the following on the REACTOR MANUAL CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Rod Drift Alarm

b. JPM 276 Title: EHC Auto Cooldown
Description: The BOP Operator will commence a cooldown of the reactor plant to 20 psig utilizing Main Turbine Bypass Valves with EHC Auto Cooldown function per OI-47, Turbine-Generator System. Once the initial cooldown has commenced the US will direct the BOP Operator to adjust the setpoint to 100 psig. After setpoint has been changed the JPM will end.

K/A: 239001Main and Reheat Steam System: A4.09 Ability to manually operate and/or monitor in the control room: Reactor pressure

c. JPM 672 Title: Loss Of Reference APRM To Rod Block Monitor (RBM)
Description: The ATC Operator will begin raising reactor power to achieve 40% per Control Rod Movement Data Sheet for placing Feedwater Heaters and Moisture Separator Drain System in service. As reactor power is raised, APRM Ch 2 will fail downscale and impose a Control Rod Withdrawal Block which requires the APRM to be bypassed to allow control rod movement. Once the Control Rod Withdrawal Block is cleared, and rod movement has continued, the JPM will end.

K/A: 215002 Rod Block Monitor System A2.03; Ability to (a) predict the impacts of the following on the ROD BLOCK MONITOR SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of associated reference APRM channel: BWR-3,4,5

**Senior Reactor Operator Instant**

**Job Performance Measures**

d. JPM 257A Title: EOI Appendix-6E Injection Subsystem Lineup CS System II
Description: The ATC Operator has been directed to in water into the RPV and restore water level using Core Spray System II per EOI-Appendix-6E, Injection Subsystems Lineup Core Spray System II. The operator will determine that FCV-75-51, CORE SPRAY SYS II OUTBD INJECT VALVE and FCV-75-53, CORE SPRAY SYS II INBD INJECT VALVE are not in proper alignment. Once the alignment is corrected, injection flow to RPV is established and reactor water level is > TAF (-162 in) the JPM will end.

K/A: 209001 Low Pressure Core Spray System A4.08 Ability to manually operate and/or monitor in the control room: Reactor water level

e. JPM 670A Title: EOI Appendix-11F Alternate RPV Pressure Control Systems: RFPT On Minimum Flow
Description: The BOP Operator has been directed to lower reactor pressure to 800 – 1000 psig by placing A RFPT in Alternate Pressure Control per EOI-Appendix-11F. As speed reaches 350 RPM the A RFPT will trip and require the operator to start B RFPT for pressure control. Once 2B RFPT is in service and reactor pressure is lowering the JPM will end.

K/A: 239001 Main and Reheat Steam System A1.01 Ability to predict and/or monitor changes in parameters associated with operating the MAIN AND REHEAT STEAM SYSTEM controls including: Main steam pressure

f. JPM 669 Title: EOI-Appendix-14A N2 Makeup To Primary Containment With
Description: The BOP Operator has been directed to lower Drywell Hydrogen Concentration per EOI-Appendix-14A. The operator will need to determine that Drywell Hydrogen Concentration is greater than Suppression Chamber Hydrogen Concentration and begin purging the Drywell. Once Drywell Hydrogen Concentration begins to lower the JPM will end.

K/A: 223001 Primary Containment System and Auxiliaries A2.04**;** Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High containment/drywell hydrogen concentration

**Senior Reactor Operator Instant**

**Job Performance Measures**

g. JPM 631 Title: Restore Offsite Power to 4KV shutdown board at PNL 9-23
Description: The BOP Operator has been directed to restore offsite power to 4KV Shutdown Board IAW 0-OI-82. The operator will parallel offsite to the running Diesel Generator, Once the Diesel Generator is separated from the grid the JPM will end.

K/A: 262001 A.C. Electrical Distribution A4.02 Ability to manually operate and/or monitor in the control room: Synchroscope, including understanding of running and incoming voltages

i. JPM 673A Title: Automatic Start Failure of A & C Fire Pumps
Description: The Operator has been directed to start A and C Electric Fire Pumps per 0-OI-26, High Pressure Fire Protection System from the 4KV Shutdown Boards. The operator will start A and C Fire Pumps from their local breaker cubicles. Once both fire pumps have been started the JPM will end.

K/A: 286000 Fire Protection System A2.08; Ability to (a) predict the impacts of the following on the FIRE PROTECTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Failure to actuate when required

j. JPM 674 Title: Aligning Emergency EECW Makeup To Spent Fuel Pool
Description: The Operator has been directed to align EECW Makeup to Unit 2 Spent Fuel Pool per 2-AOI-78-1 Attachment 2. The operator will locate and align EECW to Spent Fuel Pool by utilizing fire hoses and isolation valves. Once the lineup is made and water is flowing into the Spent Fuel Pool the JPM will end.

K/A: 233000 Fuel Pool Cooling and Clean-up; A2.02; Ability to (a) predict the impacts of the following on the FUEL POOL COOLING AND CLEAN-UP; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Low pool level

**Senior Reactor Operator Instant**

**Job Performance Measures**

k. JPM 307 Title: Start up and synchronize Unit 3 Preferred MMG Set
Description: The Operator has been directed to synchronize the Unit 3 Unit Preferred MMG Set per 0-OI-57C. The operator will perform local operations to synchronize U3 MMG set to the Battery Board. Once Unit 3 MMG Set has been transferred per 0-OI-57C the JPM will end.

K/A: 262002 Uninterruptable Power Supply (A.C./D.C.) A1.02; Ability to predict and/or monitor changes in parameters associated with operating the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) controls including: Motor generator outputs

Facility: Browns Ferry NPP Date of Examination: 11/16/2015

Exam Level: ☐ RO ☐ SRO-I ☒ SRO-U Operating Test No.: 15-10

| 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 |
| | | | | |
| b. | JPM 276 | EHC Auto Cooldown | D,L,S | 4 |
| c. | JPM 672A | Loss Of Reference APRM To Rod Block Monitor (RBM) | A,N,S | 7 |
| d. | JPM 257A | EOI Appendix-6E Injection Subsystem Lineup CS System II | A,M,EN,L,S | 2 |
| | | | | |
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| | | | | |
| | | | | |
| **In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)** | | | | |
| i. | JPM 673 | Automatic Start Failure of A & C Fire Pumps | E,N | 8 |
| j. | JPM 674 | Aligning Emergency EECW Makeup To Spent Fuel Pool | E,N,R | 9 |
| | | | | |

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

| * Type Codes | Criteria for RO / SRO-I / SRO-U |
|---|---|
| (A)lternate path | 4-6/4-6/2-3 |
| (C)ontrol room | |
| (D)irect from bank | ≤ 9/≤ 8/≤4 |
| (E)mergency or abnormal in-plant | ≥ 1/≥ 1/≥1 |
| (EN)gineered safety feature | ≥1/≥1/≥1 (control room system) |
| (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 | |

**Senior Reactor Operator Upgrade**

**Job Performance Measures**

b. JPM 276 Title: EHC Auto Cooldown
Description: The BOP Operator will begin commence a cooldown of the reactor plant to 20psig utilizing Main Turbine Bypass Valves with EHC Auto Cooldown function per OI-47, Turbine-Generator System. Once the initial cooldown has commenced the US will direct the BOP Operator to adjust the setpoint to 100 psig. After setpoint has been changed the JPM will end.

K/A: 239001Main and Reheat Steam System: A4.09 Ability to manually operate and/or monitor in the control room: Reactor pressure

c. JPM 672A Title: Loss Of Reference APRM To Rod Block Monitor (RBM)
Description: The ATC Operator will begin raising reactor power to achieve 40% per Control Rod Movement Data Sheet for placing Feedwater Heaters and Moisture Separator Drain System in service. As reactor power is raised, APRM Ch 2 will fail downscale and impose a Control Rod Withdrawal Block which requires the APRM to be bypassed to allow control rod movement. Once the Control Rod Withdrawal Block is cleared and rod movement has continued the JPM will end.

K/A: 215002 Rod Block Monitor System A2.03; Ability to (a) predict the impacts of the following on the ROD BLOCK MONITOR SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of associated reference APRM channel: BWR-3,4,5

d. JPM 257A Title: EOI Appendix-6E Injection Subsystem Lineup CS System II
Description: The ATC Operator has been directed to inject water into the RPV and restore water level using Core Spray System II per EOI-Appendix-6E, Injection Subsystems Lineup Core Spray System II. The operator will determine that FCV-75-51, CORE SPRAY SYS II OUTBD INJECT VALVE and FCV-75-53, CORE SPRAY SYS II INBD INJECT VALVE are not in proper alignment. Once the alignment is corrected, injection flow to RPV is established and reactor water level is > TAF (-162 in) the JPM will end.

K/A: 209001 Low Pressure Core Spray System A4.08 Ability to manually operate and/or monitor in the control room: Reactor water level

**Senior Reactor Operator Upgrade**

**Job Performance Measures**

i. JPM 673A Title: Automatic Start Failure of A & C Fire Pumps
Description: The Operator has been directed to start A and C Electric Fire Pumps per 0-OI-26, High Pressure Fire Protection System from the 4KV Shutdown Boards. The operator will start A and C Fire Pumps from their local breaker cubicles. Once both fire pumps have been started the JPM will end.

K/A: 286000 Fire Protection System A2.08; Ability to (a) predict the impacts of the following on the FIRE PROTECTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Failure to actuate when required

j. JPM 674 Title: Aligning Emergency EECW Makeup To Spent Fuel Pool
Description: The Operator has been directed to align EECW Makeup to Unit 2 Spent Fuel Pool per 2-AOI-78-1 Attachment 2. The operator will locate and align EECW to Spent Fuel Pool by utilizing fire hoses and isolation valves. Once the lineup is made and water is flowing into the Spent Fuel Pool the JPM will end.

K/A: 233000 Fuel Pool Cooling and Clean-up; A2.02; Ability to (a) predict the impacts of the following on the FUEL POOL COOLING AND CLEAN-UP; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Low pool level

Facility: BFN Date of Examination: 11-16-15 Operating Test Number: 1510

| | 1. General Criteria | Initials a | b* | c# |
|---|---|---|---|---|
| a. | The operating test conforms with the previously approved outline; changes are consistent with sampling requirements (e.g., 10 CFR 55.45, operational importance, safety function distribution). | | | |
| b. | There is no day-to-day repetition between this and other operating tests to be administered during this examination. | | | |
| c. | The operating test shall not duplicate items from the applicants' audit test(s). (see Section D.1.a.) | | | |
| d. | Overlap with the written examination and between different parts of the operating test is within acceptable limits. | | | |
| e. | It appears that the operating test will differentiate between competent and less-than-competent applicants at the designated license level. | | | |
| | **2. Walk-Through Criteria** | -- | -- | -- |
| a. | Each JPM includes the following, as applicable:<br>• initial conditions<br>• initiating cues<br>• references and tools, including associated procedures<br>• reasonable and validated time limits (average time allowed for completion) and specific designation if deemed to be time-critical by the facility licensee<br>• operationally important specific performance criteria that include:<br>– detailed expected actions with exact criteria and nomenclature<br>– system response and other examiner cues<br>– statements describing important observations to be made by the applicant<br>– criteria for successful completion of the task<br>– identification of critical steps and their associated performance standards<br>– restrictions on the sequence of steps, if applicable | | | |
| b. | Ensure that any changes from the previously approved systems and administrative walk-through outlines (Forms ES-301-1 and 2) have not caused the test to deviate from any of the acceptance criteria (e.g., item distribution, bank use, repetition from the last 2 NRC examinations) specified on those forms and Form ES-201-2. | | | |
| | **3. Simulator Criteria** | -- | -- | -- |
| The associated simulator operating tests (scenario sets) have been reviewed in accordance with Form ES-301-4 and a copy is attached. | | | | |

| | Printed Name / Signature | Date |
|---|---|---|
| a. Author | MICHAEL BARON / | 10-30-15 |
| b. Facility Reviewer(*) | Keith Nichols / | 10/30/15 |
| c. NRC Chief Examiner (#) | Joseph Viera / Phillip G. Capehart | 11/5/15 |
| d. NRC Supervisor | Gerald J. McCoy / Gerald J. McCoy | 11/10/2015 |

NOTE: * The facility signature is not applicable for NRC-developed tests.
# Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.

Facility: BFN Date of Exam: 11-16-15 Scenario Numbers: 2 / 3 / 4 Operating Test No.: 15-10

| QUALITATIVE ATTRIBUTES | Initials a | b* | c# |
|---|---|---|---|
| 1. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the operators into expected events. | | | |
| 2. The scenarios consist mostly of related events. | | | |
| 3. Each event description consists of<br>• the point in the scenario when it is to be initiated<br>• the malfunction(s) or conditions that are entered to initiate the event<br>• the symptoms/cues that will be visible to the crew<br>• the expected operator actions (by shift position)<br>• the event termination point (if applicable) | | | |
| 4. The events are valid with regard to physics and thermodynamics. | | | |
| 5. Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives. | | | |
| 6. If time compression techniques are used, the scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given. | | | |
| 7. The simulator modeling is not altered. | | | |
| 8. The scenarios have been validated. Pursuant to 10 CFR 55.46(d), any open simulator performance deficiencies or deviations from the referenced plant have been evaluated to ensure that functional fidelity is maintained while running the planned scenarios. | | | |
| 9. Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered in accordance with Section D.5 of ES-301. | | | |
| 10. All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios). | | | |
| 11. The scenario set provides the opportunity for each applicant to be evaluated in each of the applicable rating factors. (Competency Rating factors as described on forms ES-303-1 and ES-303-3.) | | | |
| 12. Each applicant will be significantly involved in the minimum number of transients and events specified on Form ES-301-5 (submit the form with the simulator scenarios). | | | |
| 13. The level of difficulty is appropriate to support licensing decisions for each crew position. | | | |

| Target Quantitative Attributes (Per Scenario; See Section D.5.d) | Actual Attributes | -- | -- | -- |
|---|---|---|---|---|
| 1. Malfunctions after EOP entry (1-2) | 2 / 3 / 3 | | | |
| 2. Abnormal events (2-4) | 3 / 2 / 3 | | | |
| 3. Major transients (1–2) | 1 / 1 / 1 / 1 | | | |
| 4. EOPs entered/requiring substantive actions (1–2) | 1 / 1 / 2 / 1 | | | |
| 5. EOP contingencies requiring substantive actions (0-2) | 1 / 0 / 1 / 0 | | | |
| 6. EOP based Critical tasks (2–3) | 2 / 2 / 1 / 3 | | | |
| NOTE: * The facility signature is not applicable for NRC-developed tests.<br># Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required. | 10-30-15 | | | |

Facility: **Browns Ferry NPP** Date of Exam: November 2015 Opera Test No.: ILT 1510

| APPLICANT | EVENT TYPE | Scenarios 1 CREW POSITION SRO | ATC | BOP | 2 CREW POSITION SRO | ATC | BOP | 3 CREW POSITION SRO | ATC | BOP | 4 CREW POSITION SRO | ATC | BOP | TOTAL | MINIMUM (*) R | I | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RO | RX | | | | | | | | | | | | | | | | |
| SRO-I | NOR | | | | | | | 2 | | | 2 | | | 2 | | | 1 |
| | I/C | | | | | | | 3, 5, 7 | | | 4, 5, 6 | | | 6 | | | 2 |
| SRO-U #1 | MAJ | | | | | | | 8 | | | 7 | | | 2 | | | 1 |
| | TS | | | | | | | 3, 6 | | | 4, 5 | | | 4 | | | 2 |
| RO | RX | | | | | 5 | | | | | | | | 1 | | 1 | |
| SRO-I | NOR | | | | | 1 | | 2 | | | 2 | | | 3 | | 1 | |
| SRO-U | I/C | | | | | 3, 6 | | 3, 5, 7 | | | 4, 5, 6 | | | 8 | | 4 | |
| | MAJ | | | | | 7 | | 8 | | | 7 | | | 3 | | 2 | |
| | TS | | | | | | | 3, 6 | | | 4, 5 | | | 4 | | 2 | |
| RO | RX | | | | | | | | | | | | | | | | |
| SRO-I | NOR | | | | | | | | | | | | | | | | 1 |
| SRO-U | I/C | | | | | | | | | | | | | | | | 2 |
| | MAJ | | | | | | | | | | | | | | | | 1 |
| | TS | | | | | | | | | | | | | | | | 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 serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for 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: **Browns Ferry NPP** Date of Exam: November 2015 Opera Test No.: ILT 1510

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

...structions:

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 serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for 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: Browns Ferry NPP Date of Examination: 11-16-15 Operating Test No.: 15-10

| Competencies | APPLICANTS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RO ☒ SRO-I ☐ SRO-U ☐ | | | | RO ☒ SRO-I ☐ SRO-U ☐ | | | | RO ☐ SRO-I ☒ SRO-U ☐ | | | | RO ☐ SRO-I ☐ SRO-U ☒ | | | |
| | SCENARIO | | | | SCENARIO | | | | SCENARIO | | | | SCENARIO | | | |
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Interpret/Diagnose Events and Conditions | | | 4 | 4 | | | 4 | 4 | | 4 | 8 | 5 | | | 8 | 5 |
| Comply With and Use Procedures (1) | | | 3 | 4 | | | 5 | 6 | | 5 | 7 | 6 | | | 7 | 6 |
| Operate Control Boards (2) | | | 5 | 5 | | | 4 | 4 | | 5 | | | | | | |
| Communicate and Interact | | | 6 | 5 | | | 6 | 5 | | 5 | 10 | 9 | | | 10 | 9 |
| Demonstrate Supervisory Ability (3) | | | | | | | | | | | 8 | 7 | | | 8 | 7 |
| Comply With and Use Tech. Specs. (3) | | | | | | | | | | | 2 | 2 | | | 2 | 2 |

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

*Instructions:*

*Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant. (This includes all rating factors for each competency.) (Competency Rating factors as described on forms ES-303-1 and ES-303-3.*

Facility: **Browns Ferry** Date of Exam: **December 2015**

| 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 | | | 4 | 3 | N/A | | 3 | 20 | 4 | | 3 | | 7 |
| | 2 | 1 | 2 | 1 | | | | 1 | 1 | | | 1 | 7 | 2 | | 1 | | 3 |
| | Tier Totals | 4 | 5 | 5 | | | | 5 | 4 | | | 4 | 27 | 6 | | 4 | | 10 |
| 2. Plant Systems | 1 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 26 | 3 | | 2 | | 5 |
| | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 12 | 0 | 2 | 1 | | 3 |
| | Tier Totals | 3 | 3 | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 38 | 5 | | 3 | | 8 |
| 3. Generic Knowledge and Abilities Categories | | 1 | | | 2 | | | 3 | | | 4 | | 10 | 1 | 2 | 3 | 4 | 7 |
| | | 3 | | | 3 | | | 2 | | | 2 | | | 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). (One Tier 3 Radiation Control K/A is allowed if the K/A is replaced by a K/A from another Tier 3 Category.)
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 with justification; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
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. Refer to Section D.1.b of ES-401 for the applicable K/As.
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 a category 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.

G* Generic K/As

| ES-401 | BWR Examination Outline<br>Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO) | | | | | | | Form ES-401-1 | |
|---|---|---|---|---|---|---|---|---|---|
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A2 | G* | K/A Topic(s) | IR | # |
| 295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4 | | | | | | X | G2.1.23 | 4.3 | |
| 295003 Partial or Complete Loss of AC / 6 | X | | | | | | AK1.06 | 3.8 | |
| | | | | | | X | G2.1.28 | 4.1 | |
| 295004 Partial or Total Loss of DC Pwr / 6 | | X | | | | | AK2.01 | 3.1 | |
| 295005 Main Turbine Generator Trip / 3 | | | X | | | | AK3.01 | 3.8 | |
| | | | | | X | | AA2.08 | 3.3 | |
| 295006 SCRAM / 1 | | | | X | | | AA1.01 | 4.2 | |
| 295016 Control Room Abandonment / 7 | | | X | | | | AK3.01 | 4.1 | |
| | | | | | X | | AA2.05 | 3.9 | |
| 295018 Partial or Total Loss of CCW / 8 | | X | | | | | AK2.01 | 3.3 | |
| | | | | | X | | AA2.05 | 2.9 | |
| 295019 Partial or Total Loss of Inst. Air / 8 | | | | | X | | AA2.02 | 3.6 | |
| | | | | | X | | AA2.01 | 3.6 | |
| 295021 Loss of Shutdown Cooling / 4 | | X | | | | | AK2.07 | 3.1 | |
| 295023 Refueling Acc / 8 | | | | X | | | AA1.06 (Revised following discussion on 10/13 from AA1.04) | 3.3 | |
| 295024 High Drywell Pressure / 5 | | | | X | | | EA1.20 | 3.5 | |
| 295025 High Reactor Pressure / 3 | | | X | | | | EK3.06 | 4.2 | |
| | | | | | | X | G2.4.30 | 4.1 | |
| 295026 Suppression Pool High Water Temp. / 5 | | | | | | X | G2.1.31 (Revised following discussion on 9/10 from G2.1.28) | 4.6 | |
| 295027 High Containment Temperature / 5 | | | | | | | | | |
| 295028 High Drywell Temperature / 5 | | | | | X | | EA2.03 | 3.7 | |
| 295030 Low Suppression Pool Wtr Lvl / 5 | | | | | | X | G2.4.46 | 4.2 | |
| 295031 Reactor Low Water Level / 2 | X | | | | | | EK1.02 | 3.8 | |
| | | | | | | X | G2.1.25 | 4.2 | |
| 295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1 | X | | | | | | EK1.07 | 3.4 | |
| 295038 High Off-site Release Rate / 9 | | | | X | | | EA1.01 | 3.9 | |
| 600000 Plant Fire On Site / 8 | | | X | | | | AK3.04 | 2.8 | |
| 700000 Generator Voltage and Electric Grid Disturbances / 6 | | | | | X | | AA2.05 | 3.2 | |
| K/A Category Totals: | 3 | 3 | 4 | 4 | 3/4 | 3/3 | Group Point Total: | | 20/7 |

| ES-401 | BWR Examination Outline<br>Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / SRO) | | | | | | Form ES-401-1 | | |
|---|---|---|---|---|---|---|---|---|---|
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A2 | G* | K/A Topic(s) | IR | # |
| 295002 Loss of Main Condenser Vac / 3 | | | | | X | | AA2.01 | 2.9 | |
| 295007 High Reactor Pressure / 3 | | | | | | | | | |
| 295008 High Reactor Water Level / 2 | | | | | | | | | |
| 295009 Low Reactor Water Level / 2 | | | | | | X | G2.4.45 | 4.1 | |
| 295010 High Drywell Pressure / 5 | | | | | X | | AA2.06 | 3.6 | |
| 295011 High Containment Temp / 5 | | | | | | | | | |
| 295012 High Drywell Temperature / 5 | | | | | | | | | |
| 295013 High Suppression Pool Temp. / 5 | | | | | | | | | |
| 295014 Inadvertent Reactivity Addition / 1 | | | | | | | | | |
| 295015 Incomplete SCRAM / 1 | | | | | | | | | |
| 295017 High Off-site Release Rate / 9 | | | | X | | | AA1.06 | 3.2 | |
| 295020 Inadvertent Cont. Isolation / 5 & 7 | | X | | | | | AK2.11 | 3.2 | |
| 295022 Loss of CRD Pumps / 1 | | | | | | | | | |
| 295029 High Suppression Pool Wtr Lvl / 5 | | X | | | | | EK2.02 | 3.4 | |
| 295032 High Secondary Containment Area Temperature / 5 | | | | | X | | EA2.01 | 3.8 | |
| 295033 High Secondary Containment Area Radiation Levels / 9 | | | | | | X | G2.4.47 | 4.2 | |
| 295034 Secondary Containment Ventilation High Radiation / 9 | X | | | | | | EK1.01 | 3.8 | |
| 295035 Secondary Containment High Differential Pressure / 5 | | | | | | | | | |
| 295036 Secondary Containment High Sump/Area Water Level / 5 | | | X | | | | EK3.03 | 3.5 | |
| 500000 High CTMT Hydrogen Conc. / 5 | | | | | | | | | |
| K/A Category Point Totals: | 1 | 2 | 1 | 1 | 1/2 | 1/1 | Group Point Total: | | 7/3 |

| ES-401 | BWR Examination Outline<br>Plant Systems - Tier 2/Group 1 (RO / SRO) | | | | | | | | | | | | Form ES-401-1 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A2 | A 3 | A 4 | G* | K/A Topic(s) | IR | # |
| 203000 RHR/LPCI: Injection Mode | | | | | | | | X | | | | A2.08 | 2.9 | |
| 205000 Shutdown Cooling | | X | | | | | | | | | | K2.02 | 2.5 | |
| 206000 HPCI | | | X | | | | | | | | | K3.02 | 3.8 | |
| 207000 Isolation (Emergency) Condenser | | | | | | | | | | | | | | |
| 209001 LPCS | | | | | | | | | | | X | G2.1.20 | 4.6 | |
| 209002 HPCS | | | | | | | | | | | | | | |
| 211000 SLC | | | X | | | | | | | | | K3.01 | 4.3 | |
| | | | | | | | | | | | X | G2.1.19 | 3.8 | |
| 212000 RPS | | | | | | | | | | X | | A4.13 | 3.4 | |
| | | | | | | | | X | | | | A2.14 (Revised following discussion on 8/06 from 400000 A2.02 due to oversampling) | 4.0 | |
| 215003 IRM | | | | | X | | | | | | | K5.03 | 3.0 | |
| | | | | | | | | | | | X | G2.2.22 | 4.7 | |
| 215004 Source Range Monitor | | X | | | | | | | | | | K2.01 | 2.6 | |
| | | | | | | | | X | | | | A2.05 (Revised following discussion on 10/26 from 261000 A2.12. Revised following discussion on 10/13 from 261000 A2.01) | 3.5 | |
| 215005 APRM / LPRM | | | | | | | | | | X | | A4.01 | 3.2 | |
| | | | | | X | | | | | | | K5.06 | 2.5 | |
| 217000 RCIC | | | | X | | | | | | | | K4.01 | 2.8 | |
| 218000 ADS | | | | | | | | | | | X | G2.4.35 (Revised following discussion on 6/4 from G2.4.30) | 3.8 | |
| | X | | | | | | | | | | | K1.03 | 3.7 | |
| 223002 PCIS/Nuclear Steam Supply Shutoff | | | | X | | | | | | | | K4.02 | 2.7 | |
| 239002 SRVs | | | | | | X | | | | | | K6.02 | 3.4 | |
| 259002 Reactor Water Level Control | | | | | | | X | | | | | A1.07 | 2.6 | |
| 261000 SGTS | X | | | | | | | | | | | K1.03 | 2.9 | |
| 262001 AC Electrical Distribution | | | | | | | | | X | | | A3.01 | 3.1 | |
| 262002 UPS (AC/DC) | | | | | | | X | | | | | A1.02 | 2.5 | |
| | | | | | | X | | | | | | K6.03 | 2.7 | |
| 263000 DC Electrical Distribution | | | | | | | | | X | | | A3.01 | 3.2 | |
| 264000 EDGs | | | | | | | | X | | | | A2.06 | 3.4 | |
| | | | | | | | | X | | | | A2.07 | 3.7 | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 300000 Instrument Air | | | X | | X | | | | | | | K3.01<br>K5.01 (Revised following discussion on 6/4 from K5.13) | 2.7<br>2.5 | |
| 400000 Component Cooling Water | | | | | | X | | X | | | | A2.01<br>K6.01 | 3.3<br>2.7 | |
| K/A Category Point Totals: | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 3/3 | 2 | 2 | 2/2 | Group Point Total: | | 26/5 |

| ES-401 | BWR Examination Outline<br>Plant Systems - Tier 2/Group 2 (RO / SRO) | | | | | | | | | | | | Form ES-401-1 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| System # / Name | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A2 | A 3 | A 4 | G* | K/A Topic(s) | IR | # |
| 201001 CRD Hydraulic | | | | | | | | X | | | | A2.11 | 2.7 | |
| | | | | | | | | | X | | | A3.06 | 2.8 | |
| 201002 RMCS | | | | | | | | | | | | | | |
| 201003 Control Rod and Drive Mechanism | | | | | | | X | X | | | | A2.05 | 4.1 | |
| | | | | | | | | | | | | A1.02 | 2.8 | |
| 201004 RSCS | | | | | | | | | | | | | | |
| 201005 RCIS | | | | | | | | | | | | | | |
| 201006 RWM | | | | | | | | | | | | | | |
| 202001 Recirculation | | | | | | | | | | | | | | |
| 202002 Recirculation Flow Control | | | | | | | | | X | | | A3.03 | 3.1 | |
| 204000 RWCU | | | | | | | | | | | | | | |
| 214000 RPIS | | | | | | | | | | | | | | |
| 215001 Traversing In-Core Probe | | | | | | | | | | | X | G2.2.12 (Revised following discussion on 10/6 from G2.2.44) | 4.1 | |
| 215002 RBM | | | | X | | | | | | | | K4.03 | 2.9 | |
| 216000 Nuclear Boiler Inst. | | | | | | | | | | | | | | |
| 219000 RHR/LPCI: Torus/Pool Cooling Mode | | | | | | | | | | | | | | |
| 223001 Primary CTMT and Aux. | | | | | | | | | | | X | G2.4.45 | 4.1 | |
| 226001 RHR/LPCI: CTMT Spray Mode | | | | | | | | | | | | | | |
| 230000 RHR/LPCI: Torus/Pool Spray Mode | | | | | | | | | | | | | | |
| 233000 Fuel Pool Cooling/Cleanup | | | | | | | | | | | | | | |
| 234000 Fuel Handling Equipment | | | | | | | | X | | | | A2.01 | 3.3 | |
| 239001 Main and Reheat Steam | | | | | | | | | | | | | | |
| 239003 MSIV Leakage Control | | | | | | | | | | | | | | |
| 241000 Reactor/Turbine Pressure Regulator | | | | | X | | | | | | | K5.05 | 2.8 | |
| 245000 Main Turbine Gen. / Aux. | | | | | | | | | | X | | A4.02 | 3.1 | |
| 256000 Reactor Condensate | | | | | | | | | | | | | | |
| 259001 Reactor Feedwater | | | | | | X | | | | | | K6.03 (Revised following discussion on 7/14 from K6.10) | 2.9 | |
| 268000 Radwaste | X | | | | | | | | | | | K1.03 | 2.6 | |
| 271000 Offgas | | | | | | | | | | | | | | |
| 272000 Radiation Monitoring | | X | | | | | | | | | | K2.03 | 2.5 | |
| 286000 Fire Protection | | | X | | | | | | | | | K3.02 | 3.2 | |
| 288000 Plant Ventilation | | | | | | | | | | | | | | |
| 290001 Secondary CTMT | | | | | | | | | | | | | | |
| 290003 Control Room HVAC | | | | | | | | | | | | | | |
| 290002 Reactor Vessel Internals | | | | | | | | | | | | | | |
| K/A Category Point Totals: | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1/2 | 2 | 1 | 1/1 | Group Point Total: | | 12/3 |

| Facility: | | | Date of Exam: | | | |
|---|---|---|---|---|---|---|
| Category | K/A # | Topic | RO | | SRO-Only | |
| | | | IR | # | IR | # |
| 1. Conduct of Operations | 2.1.1 | | 3.8 | | | |
| | 2.1.20 | | 4.6 | | | |
| | 2.1.29 | | 4.1 | | | |
| | 2.1.4 | | | | 3.8 | |
| | 2.1.23 | (Revised following discussion on 10/6 from G2.1.34) | | | 4.4 | |
| | Subtotal | | 3 | | 2 | |
| 2. Equipment Control | 2.2.1 | | 4.5 | | | |
| | 2.2.14 | | 3.9 | | | |
| | 2.2.7 | | 2.9 | | | |
| | 2.2.14 | | | | 4.3 | |
| | 2.2.25 | | | | 4.2 | |
| | Subtotal | | 3 | | 2 | |
| 3. Radiation Control | 2.3.15 | | 2.9 | | | |
| | 2.3.7 | | 3.5 | | | |
| | 2.3.15 | | | | 3.1 | |
| | Subtotal | | 2 | | 1 | |
| 4. Emergency Procedures / Plan | 2.4.1 | | 4.6 | | | |
| | 2.4.21 | | 4.0 | | | |
| | 2.4.25 | | | | 3.7 | |
| | 2.4.29 | | | | 4.4 | |
| | Subtotal | | 2 | | 2 | |
| Tier 3 Point Total | | | 10 | 10 | 7 | 7 |

| Tier / Group | Randomly Selected K/A | Reason for Rejection |
|---|---|---|
| RO T1/G1 | 295023 AA1.04 | Refueling Accidents; Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS Radiation monitoring equipment was the original K/A, all questions generated were difficulty level 1. Asked for a replacement K/A, and 295023 AA1.06 was randomly selected by the NRC. |
| RO T2/G1 | 218000 G2.4.30 | At Browns Ferry Nuclear the **Unit Operators** do not determine ADS System to determine if an internal or external report must be made to the State, NRC or TSO. Unable to develop a psychometrically valid question to the K/A at the RO level. Randomly selected G 2.4.35 as a replacement. |
| RO T2/G1 | 300000 K5.13 | At Browns Ferry Nuclear, the air system is only filtered on the inlet to the Air Compressors and they contain no alarms or automatic features that would alert the Unit Operators. Unable to develop a psychometrically valid question to the K/A at the RO level. Randomly selected 300000.K5.01 as a replacement. |
| RO T2/G2 | 259001 K6.10 | The loss of the Reactor Feed Pump Sealing Steam System has minimal affect on the Main Feedwater System. Unable to develop a psychometrically valid question to the K/A at the RO level. Randomly selected K/A 259001 K6.03 as a replacement. |
| RO T1G1 | 295026 G2.1.28 | Suppression Pool High Water Temperature; Knowledge of the purpose and function of major system components and controls. Could not write a psychometrically valid question at the RO level. The Generic K/A was randomly reselected to be G 2.1.31 |
| SRO T2G1 | 400000 A2.02 | To reduce the oversampling of the 400000 system on the exam, a replacement system of RPS was randomly selected as well as an A2 abilities statement. The new K/A number is 212000 A2.14 |

| | | |
|---|---|---|
| SRO T2G1 | 261000 A2.12 261000 A2.01 | Standby Gas Treatment System; Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: The SBGT system and its interrelationship with group 6 and Secondary Containment, made developing a psychometric valid question that was different from several others on the exam difficult. Requested a new K/A, and system 215004, Source Range Monitor System was selected with this randomly selected K/A; 215004 A2.05. |
| SRO T2G2 | 215001 G2.2.44 | Could not develop a psychometrically valid question to this K/A Randomly replaced it with 215001G2.2.12 (SRO IR 4.1): Knowledge of surveillance procedures. |
| SRO T3 | G2.1.34 | Could not develop a psychometrically valid question to this K/A Randomly replaced it with G2.1.23 (SRO IR 4.4): Ability to perform specific system and integrated plant procedures during all modes of plant operation |
| | | |

**ES-401** **Written Examination Quality Checklist** **Form ES-401-6**

Facility: Browns Ferry NPP Date of Exam: 11-16015 Exam Level: RO ☒ SRO ☒

| Item Description | | | | | Initial a | Initial b* | Initial c*# |
|---|---|---|---|---|---|---|---|
| 1. | Questions and answers are technically accurate and applicable to the facility. | | | | | | |
| 2. | a. NRC K/As are referenced for all questions.<br>b. Facility learning objectives are referenced as available. | | | | | | |
| 3. | SRO questions are appropriate in accordance with Section D.2.d of ES-401 | | | | | | |
| 4 | The sampling process was random and systematic (If more than 4 RO or 2 SRO questions were repeated from the last two NRC licensing exams, consult the NRR/NRO OL program office). | | | | | | |
| 5. | Question duplication from the licensee screening/audit exam was controlled as indicated below (check the item that applies) and appears appropriate<br>X The audit exam was systematically and randomly developed; or<br>__ the audit exam was completed before the license exam was started; or<br>__ the examinations were developed independently; or<br>__ the licensee certifies that there is no duplication; or<br>__ other (explain) | | | | | | |
| 6. | Bank use meets limits (no more than 75 percent from the bank, at least 10 percent new, and the rest new or modified); enter the actual RO / SRO-only question distribution(s) at right | Bank<br>12 / 5 | Modified<br>18 / 5 | New<br>45 / 15 | | | |
| 7. | Between 50 and 60 percent of the questions on the RO exam are written at the comprehension/ analysis level; the SRO exam may exceed 60 percent if the randomly selected K/As support the higher cognitive levels; enter the actual RO / SRO question distribution(s) at right. | Memory<br>*35/41<br>43 / 18 | C/A<br>*40/59<br>57 / 82 | | | | |
| 8. | References/handouts provided do not give away answers or aid in the elimination of distractors. | | | | | | |
| 9. | Question content conforms to specific K/A statements in the previously approved examination outline and is appropriate for the tier to which they are assigned; deviations are justified. | | | | | | |
| 10. | Question psychometric quality and format meet the guidelines in ES Appendix B. | | | | | | |
| 11. | The exam contains the required number of one-point, multiple choice items; the total is correct and agrees with the value on the cover sheet. | | | | | | |

| | Printed Name / Signature | Date |
|---|---|---|
| a. Author | Michael Barton / [signature] | 10-30-15 |
| b. Facility Reviewer (*) | Keith Nichols / [signature] | 10-30-15 |
| c. NRC Chief Examiner (#) | Joseph Vien / [signature] Phillip C. Capehart / [signature] | 11-5-15 |
| d. NRC Regional Supervisor | Gerald J. McCoy / [signature] Gerald J. McCoy | 11/10/2015 |

Note: * The facility reviewer's initials or signature are not applicable for NRC-developed examinations.
# Independent NRC reviewer initials items in Column "c"; chief examiner concurrence required.

* Differences noted.

# Browns Ferry (2015-302)



**ES-401** **Written Examination Review Worksheet** **Form ES-401-9**

## Instructions

[Refer to Section D of ES-401 and Appendix B for additional information regarding each of the following concepts.]

1. Enter the level of knowledge (LOK) of each question as either (F)undamental or (H)igher cognitive level.
2. Enter the level of difficulty (LOD) of each question using a 1 – 5 (easy – difficult) rating scale (questions in the 2 – 4 range are acceptable).
3. Check the appropriate box if a psychometric flaw is identified:
   - The stem lacks sufficient focus to elicit the correct answer (e.g., unclear intent, more information is needed, or too much needless information).
   - The stem or distractors contain cues (i.e., clues, specific determiners, phrasing, length, etc).
   - The answer choices are a collection of unrelated true/false statements.
   - The distractors are not credible; single implausible distractors should be repaired, more than one is unacceptable.
   - One or more distractors is (are) partially correct (e.g., if the applicant can make unstated assumptions that are not contradicted by stem).
4. Check the appropriate box if a job content error is identified:
   - The question is not linked to the job requirements (i.e., the question has a valid K/A but, as written, is not operational in content).
   - The question requires the recall of knowledge that is too specific for the closed reference test mode (i.e., it is not required to be known from memory).
   - The question contains data with an unrealistic level of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons).
   - The question requires reverse logic or application compared to the job requirements.
5. Check questions that are sampled for conformance with the approved K/A and those that are *designated SRO-only* (K/A and license level mismatches are unacceptable).
6. Enter question source: (B)ank, (M)odified, or (N)ew. Check that (M)odified questions meet criteria of ES-401 Section D.2.f.
7. Based on the reviewer's judgment, is the question as written (U)nsatisfactory (requiring repair or replacement), in need of (E)ditorial enhancement, or (S)atisfactory?
8. At a minimum, explain any "U" ratings (e.g., how the Appendix B psychometric attributes are not being met).

Revision 0 incorporates comments from 8/12 phone conversation
Revision 1 incorporates comments from 9/10 phone conversation
Revision 2 & 3 incorporate comments from Draft Submittal Review
Revision 4 incorporates comments from 10/6 phone conversation
Revision 5 incorporates comments from the In-Office Review
Revision 6 incorporates comments following Prep Week

| Q# | 1. LOK (F/H) (H%) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. B/M/N (Prev used) | 7. U/S | 8. Explanation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | | | |
| | | | | | | | | | | | | | | | | 100 Questions Total (review complete) |
| | 35/40 (53%) | 1 | | | | 6 | | | | | | 5 | | 8(1)/16(4)/51 (5 RO) | 12/63 | RO – #10, 11, 23, 31, 32, 33, 36, 48, 58, 63, 67, 70 (16% Unsat) |
| | 6/19 (76%) | | | | | 4 | | | | | | | 2 | 3(1)/4(2)/18 (3 SRO) | 6/19 | SRO – #77, 87, 90, 91, 93, 95 (24% Unsat) |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 1 | H | 3 | | | | | | | | | | | | M (BFN 2012 NRC) | S | **Pre-Submittal Comments**<br>PCIS Group 2 Question:<br>Where the first two answer choices naturally conflict to create a plausible distractor, the third half answer choice doesn't, as both the 74-47 and 74-48 are always operated together (i.e. PCIS Grp 2 signal or Hi Rx Pressure signal; unless a failure is provided)<br>This makes the third half answer choice implausible for answer choices C and D<br>**8/12/15 comments**<br>Licensee will incorporate a Group 2 initiation parameter vs. stating that Grp 2 isolation has occurred to establish plausibility of "C" and "D" distractors.<br>**9/8/15 comments**<br>Question revised. Recommend adding the following information under the U2 mode statement in the question stem – "2A RPS is powered from its alternate source" to establish plausibility of RPS loss as stated in distractor analysis.<br>Additionally, add "**(s)**" following the words 'action' and 'actuation' in question statement.<br>**Draft Submittal Review comments**<br>Question revised, **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 2 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Remove space between "**Unit**" and "**(s)**" in question statement.<br>Question appears to be new vs. modified (as stated). While topically similar, as-written question is different from the source question (i.e. think-switch logic portion).<br>NRC Auditor Note: evaluated for Tier mismatch.<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 3 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>There is no procedure listed for the 12 hour distractor.<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. B/M/N | 7. U/E/S | 8. Explanation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | | | |
| 4 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Cueing introduced with second half of answer choices C.1 and D.1. Remove the words, "and Neutron Flux" from these statements. No change to answer.<br>Question statement is not bounded. This introduces a situation where there are multiple correct answers (since all first half answer choices are actually true for the listed transient). The justification for the correct answer cites the U-FSAR as the reference used. Question statement requires revision to incorporate this: "IAW the U-FSAR, in the event of a …".<br>This may require breaking out the second half question to be standalone, i.e: "The Reactor Scram initiated above is performed to prevent exceeding …".<br>**In-Office Review comments**<br>Question is **SAT**. |
| 5 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Teaching provided in question stem. Remove the words, "causing a half scram".<br>NRC Auditor Note: evaluated for Tier mismatch.<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 6 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Plausibility concern with the C.1 and D.1 distractors. Limiting CCW heat load doesn't adequately offset preparation for a plant cooldown, as a distractor, during a major plant transient.<br>First half question is awkwardly worded since it appears that this statement was molded directly from procedure language.<br>To correct both issues referenced above, reword first half question and answers to state, "The manual reactor SCRAM performed during 3-AOI-100-2 is/is NOT based on allowing time for operators to prepare for a plant cooldown".<br>Additionally, include the procedure that specifies accomplishment for manual field initiation of ARI. If it can only be triggered in the MCR, then it is also an implausible distractor.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 7 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>NRC Auditor Note: evaluated for Tier mismatch.<br>Question is **SAT**.<br>**In-Office Review Comments**<br>Question is **SAT**. |
| 8 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Remove last bullet of initial conditions and insert into question stem: "IAW 3-EOI-Appendix-1D, the Unit Operator will insert control rods by directing manual action to _____."<br>Question appears to be new vs. modified (as stated). While topically similar, as-written question is different from the source question (i.e. procedural step cited).<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |
| 9 | H | 3 | | | | | | | | | | | | M<br>(Htch 2007 NRC) | S | **Draft Submittal Review comments**<br>With inclusion of Initial Condition 4th bullet information, 3rd bullet information is not necessary.<br>NRC Auditor Note: evaluated for Tier mismatch.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 10 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>As-written question is LOD=1 (use of graphic and performance of log scale reading).<br>Facility requested a new K/A based on effort expended, K/A 295023 AA1.06 supplied.<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |
| 11 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Second half question is a tack-on question to permit use of the 2x2 format and has no bearing on meeting the KA.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 12 | H | 3 | | | | | | | | | | | | B (Clntn 2007 NRC) | S | **Draft Submittal Review comments**<br>As-written question asks for basis of ARI on High Reactor Pressure but the identified correct answer is system function.<br>Additionally, answer choice "D" requires repair as it is not credible for the question subject matter (i.e. de-energizing).<br>**In-Office Review comments**<br>Question is **SAT**. |
| 13 | H | 3 | | | | | | | | | | | | N | S | **9/8/15 comments (Pre-submittal question)**<br>Facility requests a new K/A for this question based on effort expended. K/A 295026 G2.1.31 supplied.<br>**Draft Submittal Review comments**<br>Revise 1st bullet of Initial Conditions to state: "… 1-179 has failed open." Remove 4th bullet from initial conditions (see below).<br>Remove errant "is" from 3rd bullet of Initial Conditions.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 14 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Remove the first bullet from the Initial Conditions (see below).<br>The addition of the Curve 8 picture, in particular the title of the y-axis "Temp near Instrument Runs" removes the C.2 and D.2 distractors as being plausible.<br>Add a bullet to state: "Current conditions indicate entry into the Action Required region of Curve 8, RPV Saturation Temp." and remove the graphic from the question.<br>**In-Office Review comments**<br>Question is **SAT**. |

| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 15 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Remove the phrase "if valid" in the question statement. This phrase disqualifies all answer choices.<br>Remove all Initial Condition information above the question statement. Incorporate annunciator 3-9-3B into the question statement: "Annunciator 3-9-3B window 15, SUPPR CHAMBER WATER LEVEL ABNORMAL is currently in alarm due to Low SP Water Level. Which one of the following answer choices provides the indication supporting SP Level trend?"<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |
| 16 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Extraneous information also requires removal from this question (i.e. Initial Condition information, "adds negative reactivity" in question stem, second half statements in answer choices).<br>**In-Office Review comments**<br>Question is **SAT**. |
| 17 | H | 3 | | | | | | | | | | | | M (PBtm 2007 NRC) | S | **Draft Submittal Review comments**<br>Remove all information in the question above the question statement. None of it is required to answer the question.<br>Supplied answers need revision for consistency. Revise answer choices to match those below:<br>"A. SLC injected into RPV to a tank level of 40%<br>B. SLC injected into RPV to a tank level of 60%<br>C. All Control Rods inserted to 00 except 2 at notch 18<br>D. All Control Rods inserted to 00 except 18 at notch 02"<br>**In-Office Review comments**<br>Question is **SAT**. |
| 18 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 19 | F | 3 | | | | | | | | | | | | B | S | **Draft Submittal Review comments**<br>EPIP-17 Section 3.2 (and Appendix A) doesn't specify that only Unit 1 is responsible for sounding the plant Fire Alarm. Per the reference provided, it appears that the plant fire alarm can be sounded from the unit receiving the report. Multiple correct answers.<br>**In-Office Review comments**<br>Question converted from 2x2 format to 1x4 format to eliminate 1st half question plausibility issue.<br>Question is **SAT**. |
| 20 | F | 3 | | | | | | | | | | | | N | S | **Pre-Submittal Comments**<br>Second half question asks who receives communication concerning Grid Status (i.e. Duty Officer, Operators, or Transmission Operator). Answer choice B (distractor) would require discussion concerning plausibility since both answer choices are filled by facility personnel. Additionally, answer choice D (distractor) may not be plausible due to layout of question (i.e. when would the UO ever notify Transmission of Grid Status changes).<br>**8/12/15 comments**<br>Following discussion, K/A remains valid for use with 0-AOI-57-1E, Grid Instability.<br>**9/8/15 comments**<br>New question provided. SAT. However, question statement is confusing, reword to state: "IAW … what is the maximum MVAR outgoing limit to maintain the offsite qualification of both the 500kV and 161kV offsite power sources?"<br>Facility will implement proposed changes.<br>**Draft Submittal Review comments**<br>Question revised, **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 21 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Revise question statement to read: "As Reactor water level lowers, receipt of which alarm indication below corresponds to the level at which a RR Pump trip is required?"<br>Remove statement addressing "automatic actions."<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. B/M/N | 7. U/E/S | 8. Explanation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | | | |
| 22 | H | 3 | | | | | | | | | | | | M (BFN 2015 NRC) Last two exams | S | **Draft Submittal Review comments**<br>Single implausible distractor (B). Answer choice 'B' relies on an unstated assumption that radiation builds up in the trapped decay products of the 6 hour holdup volume? Not possible with no flow.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 23 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>As-written question does not meet K/A based on knowledge of interrelation b/w SBGT and PCIS.<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |
| 24 | F | 3 | | | | | | | | | | | | B (BFN 2011 NRC) | S | **Draft Submittal Review comments**<br>NRC Auditor Note: evaluated for Tier mismatch.<br>Question is **SAT**.<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |
| 25 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Revise temperature reading of 2-TIS-1-60A to be "… 170 F and rising".<br>Question is **SAT**.<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 26 | H | 3 | | | | | | | | | | | | M (BFN 2012 NRC) | S | **Draft Submittal Review comments**<br>Initial Condition indications are confusing (2 groups of 4). If each group is indicative of different operator displays (assuming A and B channels?), include the source channel (refer to included reference 1-OI-90 Note 3 as an example of a clear layout).<br>NRC Auditor Note: evaluated for Tier mismatch.<br>Question is **SAT**.<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |
| 27 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Revise first half question to state: “An EOI-3, Secondary Containment Control, entry condition is first met when level rises an additional __(1)__ inches.”<br>The second half question is asking for an EOI-3 step basis concerning protection of Secondary Containment. Preventing the spread of contamination is implausible as a basis for protection of Secondary Containment. Revise B.2/D.2 distractors to read “maintain RB negative pressure”.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 28 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>The as-written question doesn’t bound the usage of RHR with the conditions supplied. With the ‘B’ RHR Loop in DW Spray and with pressure < 12 psig, the applicant may make the determination that since only Torus Spray is required IAW 3-EOI-2 and since Torus Spray can be placed in service in parallel with SPC, then B.1 and D.1 distractors can be ruled as correct answers.<br>Additionally, how could a lack of room cooling cause RHR pump seal damage? Aren’t RHR seals cooled by dedicated seal coolers that rely on cooling water and not forced air circulation? Second half answer choices are implausible.<br>Revise second half question to test knowledge of the auto initiation temperature setpoints of RHR room cooler vs. HPCI room cooler.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 29 | F | 3 | | | | | | | | | | | | M (BFN 2008 NRC) | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 30 | H | 3 | | | | | | | | | | | | B (BFN 2014 NRC)<br>Last two exams | S | **Draft Submittal Review comments**<br>Concerning reactor water level cues in the Initial Conditions, it is sufficient to state that HPCI is operating in the Pressure Control Mode since the question merely asks how the system has responded to a low CST level. Remove references to "(-) 69 inches and + 33 inches" from Initial Conditions.<br>Revise 'B' distractor to state: "operating in pressure control with suction from the Suppression Pool"<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |
| 31 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Based on the P&L cited as a reference, there appears to be no correct answer to this question. With the pump deadheaded and with no minimum flow-path available, the only restriction is how long the pump can run until mechanical failure. Core Spray pump mechanical failure is not addressed in the P&L cited.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 32 | F | 3 | | | | | | | | | | | | M (BFN 2013 NRC) | S | **Draft Submittal Review comments**<br>Answer choices 'C' and 'D' are implausible. Why would applicant conclude that there are four separate flowpaths based on the question? Additionally, since the SLC system uses a positive displacement pump, how would a difference in pump head affect injection rate (as stated in justification)? Neither of these justifications account for single failure criteria of safety significant systems.<br>Question appears to be modified vs. bank (as stated). While topically similar for half of original question, as-written question is different from the source question (i.e. plant condition diagnosis).<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 33 | H | 3 | | | | | | | | | | | | M (QCit 2009 NRC) | S | **Draft Submittal Review comments**<br>Remove 1st bullet of Initial Conditions as it provides no information necessary to answer/justify answers for this question.<br>The question as-written provides applicant with first half answer (question asks if rod has scrammed, 2nd bullet and question statement imply rod has scrammed) thereby making all distractors implausible.<br>Justification statement for 'A' distractor implies an additional topic being tested by question (relationship between rod select matrix, SCRAM test panel, and rod select switch). Why is this additional topic being tested?<br>Cueing present in 2nd bullet of Initial Conditions, revise the second bullet to read, "An operator at Panel 2-9-16 inadvertently lowers the toggle switch for Control Rod 22-43 to the down position."<br>Cueing present in question stem, remove the following information from the question statement, "… while the SCRAM switch is in the down position?"<br>**In-Office Review comments**<br>Question is **SAT**. |
| 34 | H | 3 | | | | | | | | | | | | M (Nine 2010 NRC) | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 35 | F | 3 | | | | | | | | | | | | B (Coop 2011 NRC) | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |

| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. B/M/N | 7. U/E/S | 8. Explanation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | | | |
| 36 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Justification statements discuss indications of Rod Withdrawal Blocks and Half-Scrams, yet the as-written question addresses none of those topics. Additionally, the justification statements imply that all answer choices presented in answers are present on given recorder graphic, only the correct answer is indicated on the graphic.<br>C.1 and D.1 distractor choices have no basis in the APRM Flow Biased Rod Block setpoint. Distractors also don't match SCRAM setpoint. C.1 and D.1 distractors are implausible.<br>Additionally, interplay of distractors results in implausible sets (i.e. if the setpoint is 98% how is B.2 distractor plausible? Or if the setpoint is 109% how is C.2 distractor plausible?)<br>Multiple implausible distractors present in the as-written question.<br>Question appears to be new vs. modified (as stated). While topically similar, as-written question is different from the source question (i.e. operation of recorder display).<br>Remove supplied graphic.<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |
| 37 | F | 3 | | | | | | | | | | | | B | S | **Draft Submittal Review comments**<br>Based on reference provided, the correct answer to this question is answer choice 'A'. Each APRM can only accommodate 34 LPRM inputs (with only 22 assigned) but since 43 strings are assigned per channel, 2 instruments are necessary (an LPRM (21) + APRM (22) instrument).<br>Revise question to reflect correct answer and question statement to read, "How many LPRM strings are assigned to each APRM instrument…"<br>**In-Office Review comments**<br>Question is **SAT**. |
| 38 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 39 | F | 3 | | | | | | | | | | | | N | S | Facility requested a new K/A based on effort expended, K/A 218000 G2.4.35 supplied.<br>**Draft Submittal Review comments**<br>Cueing provided in opening statement. Remove top two sentences of question Initial Conditions.<br>Revise answer choice 'A' to read, "A. open the ADS System Logic Bus A breaker on 250V RMOV board 1B"<br>Why does correct answer reference a room, yet the other choices reference specific panels or a SWBD? Revise answer choice 'B' to read, "pull 250V Logic A fuses at Panel 1-9-30"<br>**In-Office Review comments**<br>Question is **SAT**. |
| 40 | F | 3 | | | | | | | | | | | | M (BFN 2014 NRC) Last two exams | S | **Draft Submittal Review comments**<br>Revise question statement to read, "Reactor Water Level Instruments, __(1)__, provide the Reactor Vessel water level initiation signal to ADS initiation logic at __(2)__ inches." (eliminates cueing of 'Low-Low-Low' signal description)<br>Discussion required.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 41 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>The terms used for answer choices B and D are confusing and are very open to interpretation (multiple implausible distractors).<br>Remove cue from question statement, "… without causing a device actuation?"<br>**In-Office Review comments**<br>Question is **SAT**. |

| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 42 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Remove entire first section of Initial Conditions (first two sentences). None of the information contained within it are necessary to answer the question.<br>Revise question statement to read, "Select the operating modes available to ADS MSRV 1-22 immediately following a loss of Drywell Control Air (DWCA)."<br>Remove answer statement words, "ADS MSRV 1-22 will …"<br>Answer choice 'A' is implausible (loss of DWCA prevents ability to automatically depressurize (ADS), manually ED, or to automatically relieve on overpressure?). (single implausible distractor, requires repair)<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |
| 43 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 44 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 45 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Remove the EDG Mode Select Switch graphic from this question as it is not needed to answer this question.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 46 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Revise second half answer choices to read, "A.1/C.1 Battery Board 2 Panel 13 B.1/D.1 Battery Board 2 Panel 14" (removes "on all 3 units" cue and provides consistency between answer choices)<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 47 | H | 3 | | | | | | | | | | | | M (2014 NRC Exam) Last two exams | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>**In-Office Review comments**<br>Revised question to be provided by facility. (Cabinet change due to overlap with #46)<br>**Prep Week comments**<br>Question is **SAT**. |
| 48 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Question asks for applicant to identify system power source yet K/A match specifies applicant knowledge of automatic operation monitoring. Monitoring light indication loss on loss of power is not an automatic operation. K/A is not met with this question.<br>**In-Office Review comments**<br>Revised question to be provided by facility.<br>**Prep Week comments**<br>Question is **SAT**. |
| 49 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Justification statement and supplied reference picture do not match. Does EDG C supply 4kV SD Bd C or 4kV SD Bus 1 or both?<br>Remove EDG D from all answer choices as the applicant is being asked to decide between EDG B vs EDG C.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 50 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 51 | F | 3 | | | | | | | | | | | | N | S | Facility requested a new K/A based on effort expended, K/A 300000 K5.01 supplied.<br>**Draft Submittal Review comments**<br>Answer choice 'A' differs from all other answer choices considering the detail of those choices, thereby making it of minimal discriminatory value. (requires repair)<br>Additionally, as-written answer choices are a collection of T-F statements.<br>To correct above issue, revise answer choice 'A' to read, "All lead compressors and a single lag compressor started with a 2 psig offset."<br>**In-Office Review comments**<br>Question is **SAT**. |
| 52 | H | 3 | | | | | | | | | | | | M (BFN 2012 NRC) | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 53 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Remove teaching cue from Initial Conditions (i.e. opening statement and first bullet). Supplying knowledge of P/S is unnecessary to correctly answer this question.<br>It is not plausible that the RBCCW Surge Tank is located on the Reactor Building roof (unless this elevation contains both RBCCW components and is indoors). (single implausible distractor that requires repair)<br>**In-Office Review comments**<br>Question is **SAT**. |
| 54 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Right hand side graphic (i.e. of CRD FCV controller) is not needed to answer this question. Ensure right hand side graphic is removed.<br>**In-Office Review comments**<br>Question is **SAT**. |

| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 55 | F | 3 | | | | | | | | | | | | M (VY 2010 NRC) | S | **Draft Submittal Review comments**<br>Question statement and short answer statement for first half answer don't match. Revise question statement to read, "Which ONE of the following completes the following statements?"<br>Remove teaching from the first half short answer statement. Revise this statement to read, "An insert signal ports __(1)__ gpm of drive water flow to effect Control Rod movement."<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |
| 56 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Revise question statement to read, "Recirculation Pump speed lowers to achieve …"<br>**In-Office Review comments**<br>Question is **SAT**. |
| 57 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Answer choice 'B' is implausible and requires repair (i.e. setpoint used only during initial steam system pressurization, not during power operation > 25%).<br>Answer choice 'C' and 'D' statements do not match as-written question (i.e. Q: … what provides the signal, A: … signals).<br>To correct readability issue, correct the implausible distractor, and remove teaching in the question stem, revise question statement to read, "As Reactor Power rises, the RBM receives a(n) _____ signal to begin enforcing Rod Blocks."<br>And answers to read:<br>"A. Total Steam Flow<br>B. Reactor Recirculation Flow<br>C. Local Power Range Monitor<br>D. Average Power Range Monitor"<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. B/M/N | 7. U/E/S | 8. Explanation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | | | |
| 58 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Correct RCC system designation in answer choice 'D' (i.e. RBCCW vs RBBCW).<br>Correct spelling of window in 2nd bullet of Initial Conditions (i.e. window vs. widow).<br>Question justification statement explains that annunciator prioritization is utilized by this question, yet both annunciator windows 19 and 26 contain actions associated with DW pressure in conjunction with the high OOS DW pressure indication given (i.e. DW DP compressor operation).<br>Additionally, answer choices 'A' and 'D' are justified by stating their relationship to a high DW temperature condition. Yet no information in the question stem would cause applicant to perform any evaluation of DW temperature. (multiple implausible distractors)<br>As-written question does not prompt applicant to perform an interpretation of significance or prioritization of plant annunciator or alarm. Question asks applicant to determine required action for errant component operation. As-written question does not match the K/A.<br>**In-Office Review comments**<br>Revised question to be provided by facility. (i.e. order of actions required)<br>**Prep Week comments**<br>Revise question to add an Avg Hi DW Temp indication of 135F (addresses plausibility of B/D distractors).<br>Question is **SAT**. |
| 59 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Revise question statement to read, "… action(s) is/are IMMEDIATELY required by Technical Specifications."<br>Since condition specified by question stem is movement of control rods while in Refuel, the remainder of answer choice 'D' is unnecessary. Revise answer choice 'D' to read, "Suspend in-vessel fuel movement".<br>Answer choice 'C' is implausible, as T.S. never mandate's an immediate mode change as part of required actions (single implausible distractor requiring repair). Revise answer choice 'C' to read: "Suspend loading fuel assemblies into the core".<br>Discussion required with facility to ensure as-written question is not LOD=5.<br>**In-Office Review comments**<br>Facility supports position that as-written question is not LOD=5.<br>Question is **SAT**. |

| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 60 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>NRC Auditor Note: Question meets K/A at Tier 2 due to relationship between RPS and Main Turbine at low load (i.e. 0%). Reactor Scram is initiated when condition of Main Turbine (i.e. CV/SV position) is "seen by RPS" once above 1st stage pressure setpoint.<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |
| 61 | H | 3 | | | | | | | | | | | | M (Perry 2013 NRC) | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 62 | F | 3 | | | | | | | | | | | | N | S | Facility requested a new K/A based on effort expended, K/A 259001 K6.03 supplied.<br>**Draft Submittal Review comments**<br>Replace the word "with" in the question statement to "from".<br>**In-Office Review comments**<br>Question is **SAT**. |
| 63 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Answer choices 'C' and 'D' are implausible (multiple implausible distractors). The tanks referenced as answer choices are "Floor Drain" tanks. There is no basis for selection of a "Floor Drain" tank receiving "Equipment Drains" when the as-written question specifies the normal discharge path.<br>It appears that question/answer statements can be reversed to result in a plausible question (e.g. The Waste Collector Tank normally receives discharge from _____ ."<br>**In-Office Review comments**<br>Question is **SAT**. |

| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. B/M/N | 7. U/E/S | 8. Explanation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | | | |
| 64 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Justification for answer choice 'D' states that 48VDC is a power source for the Stack-Gas radiation monitors. What specific component is powered by 48 VDC in the Stack-Gas radiation monitoring system?<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 65 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 66 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Remove the following words from the question statement, "(with a 25% grace period)" (results in implausibility of answer choices).<br>**In-Office Review comments**<br>Question is **SAT**. |
| 67 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Justification statements and reference provided refute plausibility of distractors for the as-written question (i.e. if all other procedure types available are associated with abnormal/emergency response – where all steps are critical, why would critical step annotation be required?). (multiple implausible distractors)<br>**In-Office Review comments**<br>Revised question to be provided by facility.<br>**Prep Week comments**<br>Revise question to add "only" at end of distractor A.<br>Question is **SAT**. |
| 68 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |

| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 69 | H | 3 | | | | | | | | | | | | B | S | **Draft Submittal Review comments**<br>Revise 1st bullet of initial conditions to read, "SRM PERIOD, (1-9-5A, Window 20), alarm sealed in"<br>Remove 2nd bullet of initial conditions as this is not needed to correctly answer the question (increases plausibility of answer choice 'A').<br>Revise question statement to read, "In accordance with 1-GOI-100-1A, the Unit Operator …"<br>**In-Office Review comments**<br>Revised JPM to be provided by facility due to overlap with this question (COO-2A).<br>Question is **SAT**.<br>**Prep Week comments**<br>Revised JPM provided.<br>Question is **SAT**. |
| 70 | H | 3 | | | | | | | | | | | | M<br>(DArld 2011 NRC) | S | **Draft Submittal Review comments**<br>Highlighting of "**NOT**" required per NUREG, App B, Section C.2.e.<br>Investigate if question can be reworded to elicit a "positive" answer vs the as-written "negative" response. (backward logic utilized by question)<br>Answer choices 'A' and 'B' are implausible for the as-written question. These distractors *define* approved methods of maintaining equipment status during maintenance and normal plant activities. (multiple implausible distractors)<br>**In-Office Review comments**<br>Revised question to be provided by facility.<br>**Prep Week comments**<br>Revise answer choice D to be "12 hours" vs "72 hours". Re-order "C" and "D" distractors. Incorporate procedure into question statement (i.e. IAW NPG-SPP-…).<br>Question is **SAT**. |
| 71 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Ensure answer order is consistent, i.e. longest to shortest or shortest to longest.<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. B/M/N | 7. U/E/S | 8. Explanation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | | | |
| 72 | F | 3 | | | | | | | | | | | | B | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 73 | H | 3 | | | | | | | | | | | | M<br>(BFN 2015 NRC)<br>Last two exams | S | **Draft Submittal Review comments**<br>The reference cited (RCI-9.1) for the first half answer is unclear. It states that “prior approval requirements of a RWP will be waived.” But goes on to state, “IF the RWP approval requirement is waived …”<br>Additionally, the justification statement for answer choices ‘C’ and ‘D’ cite entry into High Radiation Areas as justifying use of RCI-9.1 criteria. The as-written question specifically asks about Radiation Area entry.<br>Based on the reference provided and answer choices for the as-written question, there may be multiple correct answers. Issues to be resolved are whether RCI provision is imposed for Radiation vs. High Radiation Area entries during emergency situations and whether RWP requirements are automatically waived by SM selection or via another method.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 74 | H | 3 | | | | | | | | | | | | N | S | **Pre-Submittal Comments**<br>EOP entry condition knowledge:<br>Answer choice A is implausible due to being a Torus Water Temperature when asking about Secondary Containment Control Entry. Revising to "Sec Ctmt D/P at -0.20" water" would correct implausibility. (single implausible distractor)<br>Discussion required for K/A match<br>**8/12/15 comments**<br>Licensee will revise question to more fully meet the K/A. Proposed question will require applicants to determine the appropriate EOP for entry (based on entry conditions) and the general mitigative strategy employed, to meet this KA at the RO license level.<br>**9/8/15 comments**<br>New question provided. **SAT.** In order to promote conformity between answer choices, remove the mention of appendices in answers 'B' and 'C' and EPIP in answer 'D'.<br>**Draft Submittal Review comments**<br>Revised question provided (different entry conditions/strategies used from last submitted question).<br>Revise question statement to read, "… overall mitigating strategy directed by the EOI for that parameter?"<br>Revise mitigating strategy listed for answer choice 'A' to read, "**Vent and Purge PC to maintain containment free of combustible gasses**". (remove plant component to maintain consistency between answer choices, i.e. use of "mitigating strategy" as requested by stem)<br>Revise mitigating strategy listed for answer choice 'D' to read, "**Restore Spent Fuel Pool water temperature to maintain integrity of stored fuel bundles**" (remove plant component to maintain consistency between answer choices, i.e. use of "mitigating strategy" as requested by stem)<br>**In-Office Review comments**<br>Revised question to be provided by facility.<br>**Prep Week comments**<br>Overlap issue resolved.<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 75 | H | 3 | | | | | | | | | | | | N | S | **Pre-Submittal Comments**<br>Discussion required for plausibility of answer choice B, as instantaneous power values are not used to make power maneuvering decisions off of (unless they are part of protective action set-points, not being asked here). (8 hour power history requirement?)<br>Question, as written, does not ask applicant how to perform assessment of safety functions. Question asks if SR success criteria is met based on indicated power levels. Knowledge required to answer is that of maximum licensed power level. K/A is not matched with the as-written question.<br>**8/12/15 comments**<br>Licensee will revise question to meet the K/A.<br>**9/8/15 comments**<br>New question provided. **SAT**.<br>Facility will revise opening statement of question to reflect that plant is at 100% power operation to be consistent with other exam questions.<br>**Draft Submittal Review comments**<br>Revised question provided, **SAT**. Question is not UNSAT due to K/A match being resolved prior to Draft Submittal.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 76 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>1st half question statement requires a comma "," after the word "trips".<br>Revise second half statement to read, "The offsite source supply to 4KV SD Bd A, when aligned to its alternate source, __(2)__ be credited IAW Technical Specification Bases" (revision required to clarify plant configuration for applicant)<br>No SRO screening attached to question.<br>**10/6/15 facility comments**<br>Agree to add comma after trips.<br>Agree to reword to clarify question but modify the recommended wording to:<br>Offsite power to the A 4KV Shutdown board, when aligned through the alternate feeder breaker, __(2)__ be credited in accordance with Technical Specification Bases.<br>Added SRO only screening<br>**10/7/15 comments**<br>Revised question provided.<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |

| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. B/M/N | 7. U/E/S | 8. Explanation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | | | |
| 77 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>SRO LOK not required to answer this question. Based on the conditions present in the Initial Conditions (CSST A tagged out and Start Bus 1A/2A aligned to alternate), the only CSST available and supplying power is CSST B. This is RO LOK based on knowledge of electrical distribution system layout. Once the USST is taken away (on Differential, but stated in question as "MT trips") there is only one possible answer since there is only one offsite source available.<br>With the question posed as-written, answer choices 'C' and 'D' are not plausible.<br>No SRO screening attached to question.<br>**10/6/15 facility comments**<br>Knowledge of Tech Spec 3.8.1 bases, which is not the same on U3 vs. U1/2, is required to answer this question; additionally application of Tech Spec (below the line) is SRO knowledge.<br>Agree to revise to required actions vs. condition entered.<br>Answers C and D are plausible based on the difference between the number of offsite circuits INOP vs. the number of required offsite circuits INOP.<br>**10/6/15 comments**<br>Answer choice 'C' remains implausible due to TS rules of usage (i.e. cannot *only* enter Condn E) (single implausible distractor, requires repair)<br>Additionally, subject matter tested still does not rise past the RO LOK for required number of OPERABLE offsite circuits available based on the given Initial Conditions.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 78 | H | 3 | | | | | | | | | | | | M (2010 BFN NRC) | S | **Pre-Submittal Comments**<br>The question, as written, has two implausible distractors (which are the same due to the 2x2 format of this question, answer choices A.2 and C.2). The reason for their implausibility stems from Section 1.1 of 1-AOI-100-2, which states in part that the CR Abandonment procedure becomes invalid when dealing with any type of accident (apart from expected parameter changes listed, i.e. SP/T leg of 1-EOI-2). Since the EOI appendices associated with venting/purging of PC occur only in the PC/H and PC/P legs, an adverse condition would have to be introduced to establish plausibility. Unfortunately, introducing an adverse condition invalidates using AOI-100-2 due to the same paragraph.<br>This can be made plausible by using AOI specific information<br>**8/12/15 comments**<br>Licensee will change answer choices to focus second half answers on components used, i.e. “venting containment” vs. “using DW blowers”.<br>**9/8/15 comments**<br>Recommend varying the times to 1) not be at five minute intervals and 2) using the time of level control information (i.e. level is rising) vs. time of HPCI automatic initiation to be the decision point between Alert and SAE.<br>Facility will vary timeline to limit cueing of supplied times, will definitively place level control report at < 20 minutes, and will add additional information concerning operation of RCIC to ensure plausibility of SAE distractors.<br>**Draft Submittal Review comments**<br>Question revised, **SAT**.<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 79 | H | 3 | | | | | | | | | | | | B | S | **Draft Submittal Review comments**<br>A reactor SCRAM is required upon securing both RR pumps. Answer choice 'A' is implausible as-written and requires repair.<br>Additionally, based on 1-AOI-70-1, it appears that an assessment of Drywell Cooling must be performed to determine if there has been a partial [7] vs. complete [1] loss of RBCCW (i.e. pressure indications alone are insufficient to conclude one way or the other). If the loss is big enough, plausibility is removed from wrong answer choices. This directly addresses the first half answer choices (i.e. how can applicant determine that a total loss has occurred unless DW Cooling adequacy is presented).<br>Revise first half question statement to read: "**Based on the Initial Conditions and IAW 1-AOI-70-1, the US will direct entry into __(1)__.**" (to ensure plausibility of A.1/B.1 distractors by mandating procedure tie). This doesn't address DW Cooling comment above.<br>No SRO screening attached to question.<br>**In-Office Review comments**<br>Revised question to be provided by facility.<br>**Prep Week comments**<br>Revise second half question/choices to be more definitive IAW stated procedures, i.e. " … EECW South Header can/can Not be declared OPERABLE."<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 80 | H | 3 | | | | | | | | | | | | M (2012 BFN Audit) | S | **Pre-Submittal Comments**<br>Wording of question statement implies that applicant should determine whether actions from an OI can override actions from an AOI. Is there any case at BFN where this would be true? Otherwise, how could answer choice C ever be wrong?<br>Further discussion required as this doesn't appear to hit the SRO license level as exceeding the procedurally directed setpoint of 55 psig results in direction to perform a Manual Reactor SCRAM, how does this knowledge not comply with an overall mitigative strategy due to a setpoint (i.e. within the realm of the RO level of knowledge)?<br>**8/12/15 comments**<br>Licensee will revise question to address plausibility of the "D" distractor and second half answer choices.<br>**9/8/15 comments**<br>Include the word '**first**" in the question stem to mitigate the subset issue between the pressures given in the answer choices<br>Facility will eliminate subset issue by using the word 'first' in stem. The pressure listed (66) can remain as is based on tie to Scram Air Header Alarm.<br>For NRC Reviewer: Control Air question is appropriate at BFN for an Instrument Air K/A due to plant design (no separate instrument air system).<br>**Draft Submittal Review comments**<br>Question revised, **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 81 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>No SRO screening attached to question.<br>**10/6/15 facility comments**<br>Added SRO screening to question.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. B/M/N | 7. U/E/S | 8. Explanation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | | | |
| 82 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>With the given information (and attached graph), there is no case that supports arriving at a level < -200" (i.e. C.1 and D.1 distractors).<br>**10/6/15 facility comments**<br>This chart is used to determine required actions in the EOIs based on being above or below (-)162 inches, (-)180 inches, (-)200 inches, (-)215 inches not to determine the specific level. See EOIPM 0-V-P page 21. **Operational Validity**<br>There are 3 variables' that must be evaluated on the curve therefore, misreading the curve is plausible.<br>**10/7/15 comments**<br>'Use of graph' reply by facility is understood. In order to be valid, the SRO LOK portion must be tied to use of the graph (e.g. place applicant in a Steam Cooling situation, then use the graph to determine whether or not they have reached ED criteria - i.e. -200").<br>Discussion required.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 83 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Indicated vacuum reading unit usage is unclear. Revise bullet of Initial Conditions to include either the negative "(-)" prefix *or* the word "vacuum", not both.<br>Remove the leading words from answer choice 'C': "on low condenser vacuum". These words not necessary since the only parameter provided to applicant for consideration is vacuum reading.<br>**10/6/15 facility comments**<br>Agree to revise initial conditions to remove the word vacuum. Agree to remove on Low vacuum from answer C.<br>**10/7 comments**<br>Revised question provided (see above).<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. B/M/N | 7. U/E/S | 8. Explanation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | | | |
| 84 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Revise wording of 3rd bullet to state, "… pressure is slowly rising."<br>Question supplies a Hi DW Temperature condition but then solicits the strategy for accomplishing pressure control. K/A is not met with as-written question.<br>Investigate testing knowledge of basis behind 'Action Required' region of DW Spray Initiation Limit.<br>No SRO screening attached to question.<br>**10/6/15 facility comments**<br>Agree to reword the third bullet due to overlap with #15. Disagree with K/A mismatch. Revised justifications. IAW 2-AOI-64 4.2[3] the mitigating strategy for Hi DW Temp is to vent the DW.<br>**10/6/15 comments**<br>Revised question provided (see above). Potential overlap issue resolved. K/A match justification and SRO LOK usage discussed and accepted.<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 85 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Discussion required due to ambiguity of question statement.<br>No SRO screening attached to question.<br>**10/6/15 facility comments**<br>Recommend stating: **ASSUME** that the given parameter trends continue at the same rate.<br>What will be the highest event classification required to be declared based on expected values **at 1030**?<br>**10/7/15 comments**<br>Revised question provided.<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 86 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Revise Initial Condition information to be presented in a more ordered fashion (i.e. use a bulleted list).<br>Revise graphic provided to only show appropriate 480V boards (i.e. remove parameter information in upper part of graphic and remove ties to 120V and 250VDC boards).<br>Remove the question statement. Revise answer statement to read: "IAW the Initial Conditions above and Technical Specifications, the most limiting completion time for Standby Liquid Control (SLC) is _____."<br>Revise answer choices to read:<br>"A. 1700 on 11/23/2015<br>B. 2100 on 11/23/2015<br>C. 0900 on 11/24/2015<br>D. 0900 on 11/30/2015"<br>No SRO screening attached to question.<br>**10/6/15 facility comments**<br>Agree to use bullet format. Agree to revise the graphic. Agree to question wording change and Answer format.<br>Did not use recommended time for answer C because a candidate could argue answer B or C as correct.<br>**10/7/15 comments**<br>Revised question provided. Unsure of reason behind excluding provided answer choice 'C'. Is answer choice 'B' incorrect using station procedures?<br>Discussion required.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 87 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>With reference provided (i.e. Table 3.3.1.1-1), answer is a direct lookup thereby making answer choices 'B', 'C', and 'D' implausible. Additionally, answer choice 'C' does not rise past the RO LOK due to being a one hour completion statement.<br>Revise question to require application of Technical Specifications vs. performing a direct lookup.<br>**10/6/15 facility comments**<br>Recommend changing the initial conditions to state:<br>At 0800 the IM Forman reports the following data was recorded in 2-SR-3.3.1.1.9 (IRM C). This will resolve the direct lookup.<br>Agree to change answer choices to required actions to enhance TS application and Change C to something other than a 1 hour requirement.<br>Change question statement to: In accordance with Tech Spec 3.3.1.1, the most limiting required action if any is _____.<br>A. No action required<br>B. Place the channel or trip system in trip by1400<br>C. Place the channel or trip system in trip by 2000<br>Be in MODE 3 by 2000<br>**10/6/15 comments**<br>Revised question provided.<br>Overlap issue resolved by revision. Verify "Allowable Value" column is removed from reference.<br>Facility will relocate table to question stem.<br>Remove the following words from Initial Conditions "Unit 3 is in Mode 2" (information provided by IRM range information).<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 88 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Discussion required concerning T.S. usage for as-written question.<br>**10/6/15 facility comments**<br>Clarified that UO report information is in response to the ARP actions. **Operational Validity**<br>The answer given and justification given are correct. Secondary Containment in leakage is not the problem. The problem is low SGT flow. The ARP directs the SRO to TS 3.6.4.3 SGT and not to 3.6.4.1 Secondary Containment. Even if Secondary Containment is considered INOP the most restrictive Tech Spec Required Action will still be LCO 3.0.3 due to SGT not performing its intended function (2 or more trains INOP).<br>**10/7/15 comments**<br>As provided, the AUO report information is teaching in the stem since no abnormal response is contained in these bullets.<br>As written, the question is firmly within the K/A statement at the right license level. The only issue with this question is the cueing provided for the normal plant response (i.e AUO report) and identification of the correct answer ('C').<br>Discussion required concerning T.S. usage for as-written question.<br>**In-Office Review comments**<br>Facility requested new K/A due to effort expended, K/A 261000 A2.12 provided.<br>Revised question to be provided by facility.<br>**Prep Week comments**<br>Facility requested new K/A due to effort expended, K/A 215004 A2.05 provided.<br>Revise question statement to add "At 0925…" to WOOTF statement.<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 89 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Revise second and third line of Initial Conditions to state, "0-SR-3.8.1.1(A), Diesel Generator A Monthly Operability Test, is currently in progress with the diesel operating at full load."<br>No SRO screening attached to question.<br>**10/6/15 facility comments**<br>The KW used in the original stem was the load directed by the procedure however the amount of load does not matter in this question. Revised stem wording as requested except did not use full load because the procedure does not fully load the D/G. Added the procedure names SRO screening to the question.<br>**10/7/15 comments**<br>Revised question provided (see above).<br>0-AOI-57-1A, Section 4.2, Step [1]: IF ANY EOI entry condition is met, THEN… REFER TO the appropriate EOI(s). (Otherwise N/A) Does the step referenced above result in multiple correct answers to this question or is there a procedure hierarchy knowledge piece to this question (i.e. what does REFER TO mean)?<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 90 | H | 3 | | | | | | | | | | | | M (BFN 2015 NRC) Last two exams | S | Facility requested a new K/A based on effort expended, K/A 212000 A2.14 supplied.<br>**Draft Submittal Review comments**<br>Based on the information provided in the question Initial Conditions and the reference provided, answer is a direct lookup (i.e. SR name provides two channels, Table 3.3.1.1-1 specifies two channels required, SR note specifies 6 hour requirement during maintenance). Multiple implausible distractors due to direct lookup.<br>Revise question to require application of Technical Specifications vs. performing a direct lookup.<br>**10/6/15 facility comments**<br>Revised the question to use 2-SR-3.3.1.1.8(7A/A), RPS And Rod Block High Water Level in Scram Discharge Tank Functional Test (2-LS-85-45A & 2-LS-85-45L).<br>Revised to ask most limiting required actions (TS application). This question is different than Q87 because the candidate must correctly determine the point of discovery of Inoperability by applying the Notes from the Surveillance Requirements. Revised part 1 of the question making it a modified bank question.<br>**10/6/15 comments**<br>Overlap issue resolved by revision. Verify "Allowable Value" column is removed from reference. Ensure answer choice C.1 is revised to be consistent with other questions and answer choice D.1.<br>Second half answers revised from 1530 to be 1930.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 91 | H | 3 | | | | | | | | | | | | N | S | **Pre-Submittal Comments**<br>The T.S. portion of the question being asked does not match the provided answer choices. As written, there are two correct answers due to Condition A.3 requiring entry.<br>The T.S. portion of this question relies on discerning the Mode of Applicability to ultimately determine the correct answer choice. Since T.S. operating mode is defined as “above the line” knowledge, this question does not hit the K/A at the correct license level.<br>In the case of the as-written question the T.S. Control Rod Operability tie does not match the given K/A. For that reason, this question also does not match the given K/A.<br>**8/12/15 comments**<br>Licensee will supply revised question.<br>**9/8/15 comments**<br>Per justification statement provided, and review of the question as written, it does not provide a K/A match at the SRO license level.<br>Additionally, since T.S. 3.1.5 permits separate conditional entry for each accumulator, answer choice A is also correct (i.e. multiple correct answers exist for the as-written question).<br>Facility determined that K/A replacement not required.<br>**Draft Submittal Review comments**<br>Relocate first statement under “Subsequently:” to the initial conditions and state as a bullet, “Control Rod 22-23 is currently at position 48”.<br>Under “Subsequently:”, include the following information, “The UO reports receipt of the Control Rod 22-23 SCRAM Accumulator Light”.<br>Revise second and third statements under “Subsequently:” to read, “Following AUO dispatch, the following reports are received: The Nitrogen Charging Connection Cap cannot be re-installed and RT VLV TO PI-85-34, 2-RTV-085-229A (star valve) is currently OPEN”.<br>As a distractor, answer choice B is implausible with supplied reference. LCO 3.1.4 cannot be met based on the as-written question (i.e. not possible to have > 2 CR’s SLOW because information for only two CR’s is supplied). (RO LOK)<br>As-written, answer choice ‘C’ is also correct (subset issue). There are multiple correct answers to this question as-written. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. B/M/N | 7. U/E/S | 8. Explanation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | | | |
| +91 | | | | | | | | | | | | | | | | **10/6/15 facility comments**<br>Modified the stem to address stem comments and added information for an additional CRD to enhance plausibility. Modified answer choices to enhance application of TS Required actions of in this case multiple TS sections.<br>**10/6/15 comments**<br>Overlap issue resolved with revision.<br>Facility will replace 2nd and 3rd bullets of Initial Conditions to reflect performance of the 150 psig HPCI/RCIC OPERABILITY test.<br>**In-Office Review comments**<br>Question is **SAT**. |
| 92 | H | 3 | | | | | | | | | | | | M<br>(BFN 2015 NRC)<br>Last two exams | S | **Draft Submittal Review comments**<br>Remove Initial Condition information concerning additional alarming CRD drives, "The UO reports that 5 Control Rod Drives are in alarm on the CRD Temperature Recorders."<br>Knowledge of 2-TI-393 and knowledge of interrelation between CRD temp and SCRAM times is utilized to arrive at the correct SRO level answer for this question. Provided references are not required answer this question.<br>Remove "[REFERENCE PROVIDED]" from question statement.<br>**10/6/15 facility comments**<br>Revised stem wording. Part 1 of the question is a TS bases question. Part 2 is above the line, removed References Provided.<br>**10/7/15 comments**<br>Revised question provided (see above). Overlap issue resolved.<br>Question is **SAT**.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. B/M/N | 7. U/E/S | 8. Explanation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | | | |
| 93 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>SRO LOK not utilized to answer this question.<br>**10/6/15 facility comments**<br>SRO only level of knowledge addressed by using procedure selection.<br>**10/6/2015 comments**<br>SRO procedure selection portion contains an implausible distractor. Options discussed result in not being able to meet K/A at SRO LOK.<br>Revised K/A requested due to effort expended, K/A 215001 G2.2.12 provided.<br>**In-Office Review comments**<br>Question revision required to conform to K/A (i.e. use TIP 24 month surveillance vs EDG as-given). Question is tied to generic portion of K/A, only surveillance used is incorrect and requires editorial change to conform. Review of T.S. SR's available for subject system confirms availability of necessary surveillance.<br>**Prep Week comments**<br>Question is **SAT**. |
| 94 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Question is **SAT**.<br>No SRO screening attached to question.<br>**10/6/15 facility comments**<br>Added SRO Only screening<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. B/M/N | 7. U/E/S | 8. Explanation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | | | |
| 95 | H | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>There is no application of the TRM spec utilized to correctly answer this question.<br>**10/6/15 facility comments**<br>The reference to the GOI, Aux steam loads and bypass valve position is in the stem to allow the SRO to determine the steaming rate which is used to select the correct column in TRM table 3.4.1(column A).<br>**10/6/2015 comments**<br>Revised question provided.<br>SRO LOK not utilized to answer this question. Options discussed result in not being able to meet K/A at SRO LOK.<br>Revised K/A requested due to effort expended, K/A G2.1.23 provided.<br>**In-Office Review comments**<br>Revised question to be provided by facility as supplied question results in implausible distractors.<br>**Prep Week comments**<br>Question is **SAT**. |
| 96 | F | 3 | | | | | | | | | | | | N | S | **Draft Submittal Review comments**<br>Subset issue with the first half distractors to this question (i.e within 72 hours *is* before the end of the current shift). There are multiple correct answers to this question.<br>Additionally, “On Line Work Management” is not plausible as a distractor. Requires repair.<br>No SRO screening attached to question.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. B/M/N | 7. U/E/S | 8. Explanation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | | | |
| 97 | F | 3 | | | | | | | | | | | | N | S | **Pre-Submittal Comments**<br>Question asks which of the listed LCO Applicability statements correspond to Mode changes. K/A specifies knowledge of bases in TS for LCO's and safety limits.<br>As-given question asks applicant to identify the appropriate LCO Applicability statement (i.e. section 3.0 LCO) based on definition. Since bases knowledge is not utilized to answer this question, the K/A is not met.<br>Additionally, since all that is asked is the numeric delineation of the applicability statement as opposed to application of the applicability statement, the as-given question doesn't rise past a minutiae level of knowledge.<br>**8/12/15 comments**<br>Licensee will supply revised question.<br>**9/8/15 comments**<br>The as-written question has a single implausible distractor which requires repair, answer choice "B". Since the question stem asks what is required to *permit* a mode change with an LCO not met, it is not plausible that this answer choice be one where associated actions would *not* provide appropriate measures (i.e. an affirmative answer statement is more suited to this type of question).<br>**Draft Submittal Review comments**<br>Question revised, **SAT**.<br>No SRO screening attached to question.<br>**In-Office Review comments**<br>Question is **SAT**. |

| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 98 | H | 3 | | | | | | | | | | | | B (BFN 2011 NRC) | S | **Draft Submittal Review comments**<br>Technical Specifications may be a correct answer to the as-written question. Refer to Technical Specifications Section 5.5, "Programs and Manuals", Subsection 5.5.4, "Radioactive Effluent Controls Program", Paragraph c. A revision of the first half question statement may be appropriate, "**Required actions to address off-normal operation are performed IAW the __(1)__.**"<br>Second half answer is directly answered using the supplied reference (i.e. by direct lookup). This results in implausibility of C.2 and D.2 distractors (single implausible). Requires repair.<br>Removal of reference usage would correct issue, however, use of EPIP-1 as a reference has already been provided for another question.<br>No SRO screening attached to question.<br>**In-Office Review comments**<br>Revised question to be provided by facility.<br>**Prep Week comments**<br>Overlap issue resolved.<br>Add "[Reference Provided]" to question.<br>Question is **SAT**. |
| 99 | F | 3 | | | | | | | | | | | | N | S | **Pre-Submittal Comments**<br>Question asks about Operations response on notification of a fire: Is dialing 911 or notifying the SM ever wrong?<br>**8/12/15 comments**<br>Licensee will revise question to change location of the fire and change wording of question statement from "Enter" to "In accordance with…". Will supply revised question.<br>**9/8/15 comments**<br>Revised question provided. Providing information in the stem that states: "0-SSI-001 has been addressed by the SM" and changing the first half question to state, "Which of the following procedures addresses fire mitigation strategies for the affected fire area?", could be used to minimize the plausibility of A.2 and C.2 distractors (as written, they are too strong to the point of being correct statements).<br>Additionally, clarify the second half question by stating, "In accordance with … "<br>**Draft Submittal Review comments**<br>Question revised, **SAT**.<br>No SRO screening attached to question.<br>**In-Office Review comments**<br>Question is **SAT**. |

# Browns Ferry (2015-302)



| Q# | 1. LOK (F/H) | 2. LOD (1-5) | 3. Psychometric Flaws | | | | | 4. Job Content Flaws | | | | 5. Other | | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stem Focus | Cues | T/F | Cred. Dist. | Partial | Job-Link | Minutia | #/ units | Back-ward | Q= K/A | SRO Only | B/M/N | U/E/S | Explanation |
| 100 | F | 3 | | | | x | | | | | | | | B<br>(BFN 2015 NRC)<br><br>Last two exams | S | **Draft Submittal Review comments**<br>Revise second half question to read, "If an EAL was exceeded but was resolved prior to BFN event declaration, BFN event declaration __(2)__ required." (Removes implausibility of B.2 and D.2 distractors)<br>No SRO screening attached to question.<br>**In-Office Review comments**<br>Overlap issue resolved.<br>Question is **SAT**. |

| ES-403 | Written Examination Grading Quality Checklist | Form ES-403-1 |
|---|---|---|

Facility: **Browns Ferry** Date of Exam: **11/24/2015** Exam Level: RO ☒ SRO ☒

| | Item Description | Initials a | Initials b | Initials c |
|---|---|---|---|---|
| 1. | Clean answer sheets copied before grading | | NA | |
| 2. | Answer key changes and question deletions justified and documented | | N/A | |
| 3. | Applicants' scores checked for addition errors (reviewers spot check > 25% of examinations) | | NA | |
| 4. | Grading for all borderline cases (80 ±2% overall and 70 or 80, as applicable, ±4% on the SRO-only) reviewed in detail | | N/A | |
| 5. | All other failing examinations checked to ensure that grades are justified | | N/A | |
| 6. | Performance on missed questions checked for training deficiencies and wording problems; evaluate validity of questions missed by half or more of the applicants | | NA | |

| | Printed Name/Signature | Date |
|---|---|---|
| a. Grader | Joseph Viera | 12/7/2015 |
| b. Facility Reviewer(*) | N/A | N/A |
| c. NRC Chief Examiner (*) | Phillip G. Capehart | 12/9/2015 |
| d. NRC Supervisor (*) | Eugene Guthrie | 12/15/15 |

(*) The facility reviewer's signature is not applicable for examinations graded by the NRC; two independent NRC reviews are required.