### Form 7.1-BWR Written Examination Outline for Senior Operators Limited to Fuel Handling for Boiling-Water Reactors

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Facility: Date of Exam: | | | | | | | | | | | | | | | |
| Tier | K/A Category Points | | | | | | | | | | | | | | |
| K1 | K2 | K3 | K4 | K5 | | K6 | | A1 | A2 | | A3 | A4 | G | Total |
| 1. Emergency and Abnormal Plant Evolutions |  |  |  |  |  | |  | |  |  | |  |  |  | 10 |
| 2. Plant  Systems |  |  |  |  |  | |  | |  |  | |  |  |  | 20 |
| 3. Generic Knowledge and Abilities Categories | 1 | | 2 | | | 3 | | 4 | | | Fundamentals | | | | 10 |
|  | |  | | |  | |  | | |  | | | |
| Notes:   1. Ensure that at least one topic from every knowledge and ability (K/A) category is sampled within each tier. 2. The point total for each tier in the proposed outline must match that specified in the table. The final point total for each tier may deviate by ±1 from that specified in the table. The final exam must total 40 points. 3. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system (except fuel handling equipment) or evolution (except refueling accident). 4. The shaded areas are not applicable to the category/tier. 5. The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the applicable K/A catalog, but the topics must be relevant to the applicable evolution/system. 6. Systems/evolutions within each tier are identified on the associated outline. Enter the K/A numbers, a brief description of each topic, importance ratings (IRs) for the senior reactor operator license level, and the point totals (#) for each system and category. Enter the tier totals for each category in the table above. 7. For Tier 3, select topics from Sections 2, 5, and 6 of the applicable K/A catalog. A minimum of four Tier 3 questions shall include basic reactor theory, component, and thermodynamic topics from Sections 5 and 6 of the applicable K/A catalog that apply to fuel handling operations (place these items in the “Fundamental” category). Enter the K/A numbers, descriptions, IRs, and point totals (#) on Form 7.1‑GEN. 8. Inapplicable or inappropriate K/A statements can be eliminated by (1) discarding randomly selected K/As during the outline development process or (2) prescreening the entire K/A catalog to eliminate inappropriate K/As before beginning the random selection process. Use the facility licensee’s job task analysis for fuel handlers as the basis for eliminating or adding testable topics. 9. \* These systems/evolutions must be included as part of the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan. They are not required to be included when using earlier revisions of the K/A catalog.   \*\* These systems/evolutions may be eliminated from the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan. | | | | | | | | | | | | | | | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ES-7.1 Form 7.1-BWR**  **Written Examination Outline for Senior Operators Limited to Fuel Handling for Boiling-Water Reactors**  **Emergency and Abnormal Plant Evolutions—Tier 1** | | | | | | | | | |
| E/APE #/Name/Safety Function | K1 | K2 | K3 | A1 | A2 | G | K/A Topic(s) | IR | # |
| 295003 Partial or Complete Loss of AC |  |  |  |  |  |  |  |  |  |
| 295004 Partial or Total Loss of DC |  |  |  |  |  |  |  |  |  |
| 295014 Inadvertent Reactivity Addition |  |  |  |  |  |  |  |  |  |
| 295018 Partial or Total Loss of CCW |  |  |  |  |  |  |  |  |  |
| 295021 Loss of Shutdown Cooling |  |  |  |  |  |  |  |  |  |
| 295023 Refueling Accidents |  |  |  |  |  |  |  |  |  |
| 295033 High Secondary Containment Area Radiation Levels |  |  |  |  |  |  |  |  |  |
| 295034 Secondary Containment Ventilation High Radiation |  |  |  |  |  |  |  |  |  |
| 295006 Scram |  |  |  |  |  |  |  |  |  |
| 295008 High Reactor Water Level |  |  |  |  |  |  |  |  |  |
| 295009/295031 Reactor Low Water Level |  |  |  |  |  |  |  |  |  |
| 295017/295038 High Offsite Release Rate |  |  |  |  |  |  |  |  |  |
| 295019 Partial or Total Loss of Instrument Air |  |  |  |  |  |  |  |  |  |
| 295020 Inadvertent Containment Isolation |  |  |  |  |  |  |  |  |  |
| 295030 Low Suppression Pool Water Level |  |  |  |  |  |  |  |  |  |
| 295035 Secondary Containment High Differential Pressure |  |  |  |  |  |  |  |  |  |
| 600000 Plant Fire On Site |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| K/A Category Totals: |  |  |  |  |  |  | Tier Point Total: | | 10 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ES-7.1 Form 7.1-BWR**  **Written Examination Outline for Senior Operators Limited to Fuel Handling for Boiling Water Reactors**  **Plant Systems—Tier 2** | | | | | | | | | | | | | | |
| System #/Name | K1 | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | K/A Topic(s) | IR | # |
| 205000 Shutdown Cooling |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 215004 Source Range Monitor |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 233000 Fuel Pool Cooling/Cleanup |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 234000 Fuel Handling Equipment |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 262001 AC Electrical Distribution |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 263000 DC Electrical Distribution |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 290002 Reactor Vessel Internals |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 201002 RMCS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 201003 Control Rod and Drive Mechanism |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 203000 RHR/LPCI: Injection Mode |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 204000 RWCU |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 211000 SLC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 212000 RPS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 214000 RPIS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 215001 Traversing In‑Core Probe |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 215003 IRM |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 215005 APRM/LPRM |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 223001 Primary CTMT and Aux. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 223002 PCIS/Nuclear Steam Supply Shutoff |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 261000 SGTS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 264000 EDGs |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 272000 Radiation Monitoring |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 286000 Fire Protection |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 288000 Plant Ventilation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 290001 Secondary CTMT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 300000 Instrument Air |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 400000 Component Cooling Water |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 510000\* Service Water |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| K/A Category Totals: |  |  |  |  |  |  |  |  |  |  |  | Tier Point Total: | | 20 |