

| Facility: Waterford 3  |             | Date of Exam: January 18, 2002 |    |    |       |    |       | Exam level: RO |       |    |       |     |             |
|--|-------------|--------------------------------|----|----|-------|----|-------|----------------|-------|----|-------|-----|-------------|
| Tier   | Group       | K/A Category Points            |    |    |       |    |       |                |       |    |       |     | Point Total |
|  |             | K1                             | K2 | K3 | K4    | K5 | K6    | A1             | A2    | A3 | A4    | G * |             |
| 1.<br>Emergency &<br>Abnormal Plant<br>Evolutions  | 1           | 2                              | 2  | 4  |       |    |       | 2              | 3     |    |       | 3   | 16          |
|  | 2           | 3                              | 3  | 3  |       |    |       | 2              | 3     |    |       | 3   | 17          |
|  | 3           | 1                              | 0  | 0  |       |    |       | 0              | 1     |    |       | 1   | 3           |
|  | Tier Totals | 6                              | 5  | 7  |       |    |       | 4              | 7     |    |       | 7   | 36          |
| 2.<br>Plant<br>Systems   | 1           | 3                              | 2  | 2  | 1     | 2  | 2     | 3              | 2     | 2  | 1     | 3   | 23          |
|  | 2           | 5                              | 1  | 2  | 2     | 1  | 0     | 2              | 1     | 2  | 2     | 2   | 20          |
|  | 3           | 1                              | 0  | 1  | 1     | 1  | 1     | 0              | 0     | 1  | 1     | 1   | 8           |
|  | Tier Totals | 9                              | 3  | 5  | 4     | 4  | 3     | 5              | 3     | 5  | 4     | 6   | 51          |
| 3. Generic Knowledge and Abilities   |             |                                |    |    | Cat 1 |    | Cat 2 |                | Cat 3 |    | Cat 4 |     | 13          |
|  |             |                                |    |    | 4     |    | 3     |                | 3     |    | 3     |     |             |
| <p>Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p>2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by <math>\pm 1</math> from that specified in the table based on NRC revisions. The final exam must total 100 points.</p> <p>3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>6. *The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p> |             |                                |    |    |       |    |       |                |       |    |       |     |             |

| ES-401  | PWR RO Examination Outline<br>Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 |    |    |    |    |   |  | Form ES-401-4 |        |
|---|--|----|----|----|----|---|--|---------------|--------|
| E/APE # / Name / Safety Function  | K1   | K2 | K3 | A1 | A2 | G | K/A Topic(s)   | Imp.          | Points |
| 000005 Inoperable/Stuck Control Rod / 1   |  |    |    |    |    | X | 2.4.4 - Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. (CFR: 41.10 / 43.2 / 45.6)   | 4.0           | 1      |
| 000015/17 RCP Malfunctions / 4  |  | X  |    |    |    |   | AK2.08 - Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following: CCWS. (CFR 41.7 / 45.7)  | 2.6           | 1      |
| BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4                                     |  |    |    | X  |    |   | AA1.1 - Ability to operate and / or monitor the following as they apply to the (Natural Circulation Operations) Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. (CFR: 41.7 / 45.5 / 45.6)   | 3.3           | 1      |
| 000024 Emergency Boration / 1   |  | X  |    |    |    |   | AK2.03 - Knowledge of the interrelations between the Emergency Boration and the following: Controllers and positioners (CFR 41.7 / 45.7)   | 2.6           | 1      |
| 000026 Loss of Component Cooling Water / 8                                      |  |    |    |    |    | X | 2.4.10 - Knowledge of annunciator response procedures. (CFR: 41.10 / 43.5 / 45.13)   | 3.0           | 1      |
| 000027 Pressurizer Pressure Control System Malfunction / 3                      |  |    |    |    |    | X | 2.4.9 - Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)   | 3.3           | 1      |
| 000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4 |  |    | X  |    |    |   | AK3.02 - Knowledge of the reasons for the following responses as they apply to the Steam Line Rupture: Steam line non-return valves (CFR 41.5, 41.10 / 45.6 / 45.13)   | 3.2           | 1      |
| CE/A11; W/E08 RCS Overcooling - PTS / 4   |  |    | X  |    |    |   | AK3.4 - Knowledge of the reasons for the following responses as they apply to the (RCS Overcooling): RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated. (CFR: 41.5 / 41.10, 45.6, 45.13) | 3.1           | 1      |
| 000051 Loss of Condenser Vacuum / 4   |  |    |    |    | X  |   | AA2.02 - Ability to determine and interpret the following as they apply to the Loss of Condenser Vacuum: Conditions requiring reactor and/or turbine trip. (CFR: 43.5 / 45.13)   | 3.9           | 1      |
| 000055 Station Blackout / 6   | X  |    |    |    |    |   | EK1.02 - Knowledge of the operational implications of the following concepts as they apply to the Station Blackout: Natural circulation cooling. (CFR 41.8 / 41.10 / 45.3)   | 4.1           | 1      |
| 000057 Loss of Vital AC Elec. Inst. Bus / 6                                     |  |    |    | X  |    |   | AA1.01 - Ability to operate and / or monitor the following as they apply to the Loss of Vital AC Instrument Bus: Manual inverter swapping. (CFR 41.7 / 45.5 / 45.6)  | 3.7           | 1      |
| 000062 Loss of Nuclear Service Water / 4  |  |    |    |    | X  |   | AA2.01 - Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: Location of a leak in the SWS. (CFR: 43.5 / 45.13 2.9 3.5)   | 2.9           | 1      |
| 000067 Plant Fire On-site / 9   |  |    | X  |    |    |   | AK3.04 Knowledge of the reasons for the following responses as they apply to the Plant Fire on Site: Actions contained in EOP for plant fire on site. (CFR 41.5, 41.10 / 45.6 / 45.13)   | 3.3           | 1      |

| ES-401                                    |    | PWR RO Examination Outline<br>Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 |    |    |    |   |  | Form ES-401-4 |        |
|---|----|--|----|----|----|---|--|---------------|--------|
| E/APE # / Name / Safety Function          | K1 | K2   | K3 | A1 | A2 | G | K/A Topic(s)   | Imp.          | Points |
| 000068 (BW/A06) Control Room Evac. / 8    |    |  | X  |    |    |   | AK3.06 - Knowledge of the reasons for the following responses as they apply to the Control Room Evacuation: Transfer of S/G atmospheric relief valves to local control; operation to maintain specified T-ave. (CFR 41.5,41.10 / 45.6 / 45.13) | 3.9           | 1      |
| 000069 (W/E14) Loss of CTMT Integrity / 5 | X  |  |    |    |    |   | AK1.01- Knowledge of the operational implications of the following concepts as they apply to Loss of Containment Integrity: Effect of pressure on leak rate. (CFR 41.8 / 41.10 / 45.3)   | 2.6           | 1      |
| 000074 (W/E06&E07) Inad. Core Cooling / 4 |    |  |    |    | X  |   | EA2.06 - Ability to determine or interpret the following as they apply to a Inadequate Core Cooling: Changes in PZR level due to PZR steam bubble transfer to the RCS during inadequate core cooling. (CFR 43.5 / 45.13)                       | 4.0           | 1      |
| BW/E03 Inadequate Subcooling Margin / 4   |    |  |    |    |    |   | Subject Not Applicable to Waterford III.   |               |        |
| 000076 High Reactor Coolant Activity / 9  |    |  |    |    |    |   | Eliminated through random selection process.   | N/A           | 0      |
| BW/A02&A03 Loss of NNI-X/Y / 7            |    |  |    |    |    |   | Subject Not Applicable to Waterford III.   |               |        |
| K/A Category Totals:                      | 2  | 2  | 4  | 2  | 3  | 3 | Group Point Total:   |               | 16     |

| ES-401  | PWR RO Examination Outline<br>Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 |    |    |    |    |   |   | Form ES-401-4 |        |
|---|--|----|----|----|----|---|---|---------------|--------|
| E/APE # / Name / Safety Function  | K1   | K2 | K3 | A1 | A2 | G | K/A Topic(s)  | Imp.          | Points |
| 000001 Continuous Rod Withdrawal / 1                                    |  | X  |    |    |    |   | AK2.01 - Knowledge of the interrelations between the Continuous Rod Withdrawal and the following: Rod bank step counters. (CFR 41.7 / 45.7)   | 2.9           | 1      |
| 000003 Dropped Control Rod / 1  |  |    |    |    |    | X | 2.4.2 - Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. (CFR: 41.7 / 45.7 / 45.8)  | 3.9           | 1      |
| 000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1 |  | X  |    |    |    |   | EK2.02 - Knowledge of the interrelations between a reactor trip and the following: Breakers, relays and disconnects. (CFR 41.7 / 45.7)  | 2.6           | 1      |
| BW/A01 Plant Runback / 1  |  |    |    |    |    |   | Subject Not Applicable to Waterford III.  |               |        |
| BW/A04 Turbine Trip / 4   |  |    |    |    |    |   | Subject Not Applicable to Waterford III.  |               |        |
| 000008 Pressurizer Vapor Space Accident / 3                             |  |    |    | X  |    |   | AA1.06 - Ability to operate and / or monitor the following as they apply to the Pressurizer Vapor Space Accident: Control of PZR level. (CFR 41.7 / 45.5 / 45.6)  | 3.6           | 1      |
| 000009 Small Break LOCA / 3   | X  |    |    |    |    |   | EK1.01- Knowledge of the operational implications of the following concepts as they apply to the small break LOCA: Natural circulation and cooling, including reflux boiling. (CFR 41.8 / 41.10 / 45.3) | 4.2           | 1      |
| 000011 Large Break LOCA / 3   |  | X  |    |    |    |   | EK2.02 - Knowledge of the interrelations between the and the following Large Break LOCA: Pumps. (CFR 41.7 / 45.7)   | 2.6           | 1      |
| W/E04 LOCA Outside Containment / 3                                      |  |    |    |    |    |   | Subject Not Applicable to Waterford III.  |               |        |
| BW/E08; W/E03 LOCA Cooldown/Depress. / 4                                |  |    |    |    |    |   | Subject Not Applicable to Waterford III.  |               |        |
| W/E11 Loss of Emergency Coolant Recirc. / 4                             |  |    |    |    |    |   | Subject Not Applicable to Waterford III.  |               |        |
| W/E02 SI Termination / 3  |  |    |    |    |    |   | Subject Not Applicable to Waterford III.  |               |        |
| 000022 Loss of Reactor Coolant Makeup / 4                               |  |    |    |    |    |   | Eliminated through random selection process.  | N/A           | 0      |
| 000025 Loss of RHR System / 4   |  |    |    | X  |    |   | AA1.23 - Ability to operate and / or monitor the following as they apply to the Loss of Residual Heat Removal System: RHR heat exchangers. (CFR 41.7 / 45.5 / 45.6)                                     | 2.8           | 1      |
| 000029 Anticipated Transient w/o Scram / 1                              |  |    |    |    |    | X | 2.4.14 - Knowledge of general guidelines for EOP flowchart use. (CFR: 41.10 / 45.13)  | 3.0           | 1      |
| 000032 Loss of Source Range NI / 7                                      |  |    |    |    | X  |   | AA2.07 - Ability to determine and interpret the following as they apply to the Loss of Source Range Nuclear Instrumentation: Maximum allowable channel disagreement.                                    | 2.8           | 1      |
| 000033 Loss of Intermediate Range NI / 7                                |  |    |    |    |    |   | Eliminated through random selection process.  | N/A           | 0      |
| 000037 Steam Generator Tube Leak / 3                                    |  |    |    |    | X  |   | AA2.04 - Ability to determine and interpret the following as they apply to the Loss of Source Range Nuclear Instrumentation: Satisfactory source-range/intermediate-range overlap. (CFR: 43.5 / 45.13)  | 3.1           | 1      |
| 000038 Steam Generator Tube Rupture / 3                                 |  |    | X  |    |    |   | EK3.09 - Knowledge of the reasons for the following responses as they apply to the SGTR: Criteria for securing/throttling ECCS. (CFR 41.5 / 41.10 / 45.6 / 45.13)                                       | 4.1           | 1      |

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|--|----|--|----|----|----|---|---|---------------|--------|
| E/APE # / Name / Safety Function   | K1 | K2   | K3 | A1 | A2 | G | K/A Topic(s)  | Imp.          | Points |
| 000054 (CE/E06) Loss of Main Feedwater / 4                               | X  |  |    |    |    |   | AK1.02 - Knowledge of the operational implications of the following concepts as they apply to Loss of Main Feedwater (MFW); Effects of feedwater introduction on dry S/G. (CFR 41.8 / 41.10 / 45.3)   | 3.6           | 1      |
| BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4 |    |  |    |    |    |   | Subject Not Applicable to Waterford III.  |               |        |
| 000058 Loss of DC Power / 6  |    |  | X  |    |    |   | AK3.01 Knowledge of the reasons for the following responses as they apply to the Loss of DC Power: Use of dc control power by D/Gs. (CFR 41.5, 41.10 / 45.6 / 45.1)   | 3.4           | 1      |
| 000059 Accidental Liquid RadWaste Rel. / IX                              | X  |  |    |    |    |   | AK1.02 - Knowledge of the operational implications of the following concepts as they apply to Accidental Liquid Radwaste Release: Biological effects on humans of various types of radiation, exposure levels that are acceptable for nuclear power plant personnel, and the units used for radiation-intensity measurements and for radiation exposure levels. (CFR 41.8 / 41.10 / 45.3) | 2.6           | 1      |
| 000060 Accidental Gaseous Radwaste Rel. / IX                             |    |  |    |    | X  |   | AA2.02 - Ability to determine and interpret the following as they apply to the Accidental Gaseous Radwaste: The possible location of a radioactive-gas leak, with the assistance of PEO, health physics and chemistry personnel. (CFR: 43.5 / 45.13)  | 3.1           | 1      |
| 000061 ARM System Alarms / VII   |    |  |    |    |    | X | 2.4.10 - Knowledge of annunciator response procedures. (CFR: 41.10 / 43.5 / 45.13)  | 3.0           | 1      |
| W/E16 High Containment Radiation / IX                                    |    |  |    |    |    |   | Subject Not Applicable to Waterford III.  |               |        |
| CE/E09 Functional Recovery   |    |  | X  |    |    |   | EK3.4 - Knowledge of the reasons for the following responses as they apply to the (Reactor Trip Recovery): RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated. (CFR: 41.5 / 41.10, 45.6, 45.13)                          | 3.2           | 1      |
| K/A Category Point Totals:   | 3  | 3  | 3  | 2  | 3  | 3 | Group Point Total:  |               | 17     |



| ES-401                                   |    | PWR RO Examination Outline<br>Plant Systems - Tier 2/Group 1 |    |    |    |    |    |    |    |    |   | Form ES-401-4  |      |        |
|--|----|--|----|----|----|----|----|----|----|----|---|--|------|--------|
| System # / Name                          | K1 | K2   | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | K/A Topic(s)   | Imp. | Points |
| 001 Control Rod Drive                    |    |  |    |    | X  |    |    |    |    |    |   | K5.33 - Knowledge of the following operational implications as they apply to the CRDS: Xenon production and removal process. (CFR: 41.5/45.7)  | 3.2  | 1      |
| 003 Reactor Coolant Pump                 |    |  |    |    |    | X  |    |    |    |    |   | K6.14 – Knowledge of the effect of a loss or malfunction on the following will have on the RCPS: Starting requirements. (CFR: 41.7 / 45/5)   | 2.6  | 1      |
| 003 Reactor Coolant Pump                 |    |  |    |    |    |    | X  |    |    |    |   | A1.05 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPS controls including: RCS flow. (CFR: 41.5 / 45.5)   | 3.4  | 1      |
| 004 Chemical and Volume Control          |    | X  |    |    |    |    |    |    |    |    |   | K2.03 – Knowledge of bus power supplies to the following: Charging pumps. (CFR: 41.7)  | 3.3  | 1      |
| 004 Chemical and Volume Control          |    |  |    |    |    |    |    |    |    | X  |   | A4.06 – Ability to manually operate and/or monitor in the control room: Letdown isolation and flow control valves. (CFR: 41.7 / 45.5 to 45.8)  | 3.6  | 1      |
| 013 Engineered Safety Features Actuation |    |  |    |    |    |    | X  |    |    |    |   | A1.04 – Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ESFAS controls including: S/G level. (CFR: 41.5 / 45.5)   | 3.4  | 1      |
| 013 Engineered Safety Features Actuation |    |  |    |    |    |    |    | X  |    |    |   | A2.05 Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS; and (b) based Ability on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations; Loss of dc control power. (CFR: 41.5 / 43.5 / 45.3 / 45.13) | 3.7  | 1      |
| 015 Nuclear Instrumentation              | X  |  |    |    |    |    |    |    |    |    |   | K1.02 – Knowledge of the physical connections and/or cause- effect relationships between the NIS and the following systems: Vital ac systems. (CFR: 41.2 to 41.9 / 45.7 to 45.8)   | 3.4  | 1      |
| 017 In-core Temperature Monitor          |    |  |    |    |    | X  |    |    |    |    |   | K6.01 Knowledge of the effect of a loss or malfunction of the following ITM system components: Sensors and detectors. (CFR: 41.7 / 45.7)   | 2.7  | 1      |

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|-----------------------------------|--|----|----|----|----|----|----|----|----|----|---|---|------|--------|
| System # / Name                   | K1   | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | K/A Topic(s)  | Imp. | Points |
| 017 In-core Temperature Monitor   |  |    |    |    |    |    | X  |    |    |    |   | A1.01 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ITM system controls including: Core exit temperature. (CFR: 41.5 / 45.7)   | 3.7  | 1      |
| 022 Containment Cooling           |  | X  |    |    |    |    |    |    |    |    |   | K2.01 Knowledge of power supplies to the following: Containment cooling fans. (CFR:41.7)  | 3.0  | 1      |
| 022 Containment Cooling           |  |    |    | X  |    |    |    |    |    |    |   | K4.02 Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following: Correlation of fan speed and flowpath changes with containment pressure. (CFR: 41.7)  | 3.1  | 1      |
| 025 Ice Condenser                 |  |    |    |    |    |    |    |    |    |    |   |   |      |        |
| 056 Condensate                    | X  |    |    |    |    |    |    |    |    |    |   | K1.03 - Knowledge of the physical connections and/or cause-effect relationships between the Condensate system and the following systems: MFW. (CFR: 41.2 to 41.9 / 45.7 to 45.8)  | 2.6  | 1      |
| 056 Condensate                    |  |    |    |    |    |    |    |    |    |    | X | 2.1.32 – Ability to explain and apply all system limits and precautions. (CFR: 41.10 / 43.2 / 45.12)  | 3.4  | 1      |
| 059 Main Feedwater                |  |    |    |    |    |    |    |    | X  |    |   | A3.04 - Ability to monitor automatic operation of the MFW, including: Turbine driven feed pump. (CFR: 41.7 / 45.5)  | 2.5  | 1      |
| 059 Main Feedwater                |  |    |    |    |    |    |    |    |    |    | X | 2.1.28 – Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)   | 3.2  | 1      |
| 061 Auxiliary/Emergency Feedwater |  |    | X  |    |    |    |    |    |    |    |   | K3.02 – Knowledge of the effect that a loss or malfunction of the AFW will have on the following: S/G. (CFR: 41.7 / 45.6)   | 4.2  | 1      |
| 061 Auxiliary/Emergency Feedwater |  |    |    |    |    |    |    |    |    |    | X | 2.1.11 Knowledge of less than one hour technical specification action statements for systems. (CFR: 43.2 / 45.13)   | 3.0  | 1      |
| 068 Liquid Radwaste               |  |    |    |    |    |    |    | X  |    |    |   | A2.02 Ability to (a) predict the impacts of the following malfunctions or operations on the Liquid Radwaste System ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Lack of tank recirculation prior to release. (CFR: 41.5 / 43.5 / 45.3 / 45.13) | 2.7  | 1      |

| ES-401                        | PWR RO Examination Outline<br>Plant Systems - Tier 2/Group 1 |    |    |    |    |    |    |    |    |    |   | Form ES-401-4   |      |        |
|-------------------------------|--|----|----|----|----|----|----|----|----|----|---|---|------|--------|
| System # / Name               | K1   | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | K/A Topic(s)  | Imp. | Points |
| 071 Waste Gas Disposal        |  |    | X  |    |    |    |    |    |    |    |   | K3.04 – Knowledge of the effect that a loss or malfunction of the Waste Gas Disposal System will have on the following:<br>Ventilation system. (CFR: 41.7 / 45.6)                               | 2.7  | 1      |
| 071 Waste Gas Disposal        |  |    |    |    |    |    |    |    | X  |    |   | A3.03 - Ability to monitor automatic operation of the Waste Gas Disposal System including; Radiation monitoring system alarm and actuating signals. (CFR: 41.7 / 45.5)                          | 3.6  | 1      |
| 072 Area Radiation Monitoring | X  |    |    |    |    |    |    |    |    |    |   | K1.04 – Knowledge of the physical connections and/or cause- effect relationships between the ARM system and the following systems: Control room ventilation. (CFR: 41.2 to 41.9 / 45.7 to 45.8) | 3.3  | 1      |
| 072 Area Radiation Monitoring |  |    |    |    | X  |    |    |    |    |    |   | K5.01 – Knowledge of the operational implications of the following concepts as they apply to the ARM system: Radiation theory, including sources, types, units, and effects. (CFR: 41.5 / 45.7) | 2.7  | 1      |
| K/A Category Point Totals:    | 3  | 2  | 2  | 1  | 2  | 2  | 3  | 2  | 2  | 1  | 3 | Group Point Total:  |      | 23     |

| ES-401                           |    | PWR RO Examination Outline<br>Plant Systems - Tier 2/Group 2 |    |    |    |    |    |    |    |    |   | Form ES-401-4   |      |        |
|----------------------------------|----|--|----|----|----|----|----|----|----|----|---|---|------|--------|
| System # / Name                  | K1 | K2   | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | K/A Topic(s)  | Imp. | Points |
| 002 Reactor Coolant              |    |  |    |    |    |    | X  |    |    |    |   | A1.05 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCS controls including: RCS flow. (CFR: 41.5 / 45.7)         | 3.4  | 1      |
| 006 Emergency Core Cooling       |    |  |    |    |    |    | X  |    |    |    |   | A1.06 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ECCS controls including: Subcooling margin. (CFR: 41.5/45.5) | 3.6  | 1      |
| 010 Pressurizer Pressure Control |    | X  |    |    |    |    |    |    |    |    |   | K2.01 Knowledge of bus power supplies to the following: PZR heaters. (CFR: 41.7)  | 3.0  | 1      |
| 011 Pressurizer Level Control    |    |  |    |    |    |    |    |    |    |    | X | 2.2.12 - Knowledge of surveillance procedures. (CFR: 41.10/ 45.13)  | 3.0  | 1      |
| 012 Reactor Protection           |    |  |    |    |    |    |    |    | X  |    |   | A3.03 Ability to monitor automatic operation of the RPS, including: Power supply. (CFR: 41.7 / 45.5)  | 3.4  | 1      |
| 014 Rod Position Indication      |    |  | X  |    |    |    |    |    |    |    |   | K3.02 Knowledge of the effect that a loss or malfunction of the RPIS will have on the following: Plant computer. (CFR: 41.7 / 45.6)   | 2.5  | 1      |
| 016 Non-nuclear Instrumentation  | X  |  |    |    |    |    |    |    |    |    |   | K1.02 Knowledge of the physical connections and/or cause- effect relationships between the NNIS and the following systems: PZR LCS. (CFR: 41.2 to 41.9 / 45.7 to 45.8)                        | 3.4  | 1      |
| 026 Containment Spray            |    |  |    |    |    |    |    |    |    |    | X | 2.1.12 - Ability to apply technical specifications for a system. (CFR: 43.2 / 43.5 / 45.3)  | 2.9  | 1      |
| 029 Containment Purge            |    |  |    |    |    |    |    |    |    | X  |   | A4.04 Ability to manually operate and/or monitor in the control room: Containment evacuation signal. (CFR: 41.7 / 45.5 to 45.8)   | 3.5  | 1      |
| 033 Spent Fuel Pool Cooling      |    |  |    |    |    |    |    |    | X  |    |   | A3.02 Ability to monitor automatic operation of the Spent Fuel Pool Cooling System including: Spent fuel leak or rupture. (CFR: 41.7 / 45.5)  | 2.9  | 1      |
| 035 Steam Generator              |    |  |    | X  |    |    |    |    |    |    |   | K4.01 Knowledge of S/GS design feature(s) and/or interlock(s) which provide for the following: S/G level control. (CFR: 41.7)   | 3.6  | 1      |
| 039 Main and Reheat Steam        | X  |  |    |    |    |    |    |    |    |    |   | K1.02 Knowledge of the physical connections and/or cause-effect relationships between the MRSS and the following systems: Atmospheric relief dump valves. (CFR: 41.2 to 41.9 / 45.7 to 45.8)  | 3.3  | 1      |
| 055 Condenser Air Removal        | X  |  |    |    |    |    |    |    |    |    |   | K1.06 Knowledge of the physical connections and/or cause-effect relationships between the CARS and the following systems: PRM system. (CFR: 41.2 to 41.9 / 45.7 to 45.8)                      | 2.6  | 1      |

| ES-401                           |    | PWR RO Examination Outline<br>Plant Systems - Tier 2/Group 2 |    |    |    |    |    |    |    |    |   | Form ES-401-4   |      |        |
|----------------------------------|----|--|----|----|----|----|----|----|----|----|---|---|------|--------|
| System # / Name                  | K1 | K2   | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | K/A Topic(s)  | Imp. | Points |
| 062 AC Electrical Distribution   | X  |  |    |    |    |    |    |    |    |    |   | K1.03 Knowledge of the physical connections and/or cause- effect relationships between the ac distribution system and the following systems: DC distribution. (CFR: 41.2 to 41.9)   | 3.5  | 1      |
| 063 DC Electrical Distribution   |    |  |    | X  |    |    |    |    |    |    |   | K4.02 Knowledge of DC electrical system design feature(s) and/ or interlock(s) which provide for the following: Breaker interlocks, permissives, bypasses and cross-ties. (CFR: 41.7)   | 2.9  | 1      |
| 064 Emergency Diesel Generator   |    |  |    |    |    |    |    |    |    | X  |   | A4.10 Ability to manually operate and/or monitor in the control room: Need for, and consequences of, manually shedding (loads) safeguards bus. (CFR: 41.7 / 45.5 to 45.8)   | 3.3  | 1      |
| 073 Process Radiation Monitoring |    |  | X  |    |    |    |    |    |    |    |   | K3.01 Knowledge of the effect that a loss or malfunction of the PRM system will have on the following: Radioactive effluent releases. (CFR: 41.7 / 45.6)  | 3.6  | 1      |
| 075 Circulating Water            | X  |  |    |    |    |    |    |    |    |    |   | K1.02 Knowledge of the physical connections and/or cause- effect relationships between the circulating water system and the following systems: Liquid radwaste discharge. (CFR: 41.2 to 41.9 / 45.7 to 45.8)  | 2.9  | 1      |
| 079 Station Air                  |    |  |    |    |    |    |    | X  |    |    |   | A2.01 Ability to (a) predict the impacts of the following malfunctions or operations on the SAS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Cross-connection with IAS. (CFR: 41.5 / 43.5 / 45.3 / 45.13) | 2.9  | 1      |
| 086 Fire Protection              |    |  |    |    | X  |    |    |    |    |    |   | K5.03 Knowledge of the operational implication of the following concepts as they apply to the Fire Protection System: Effect of water spray on electrical components. (CFR: 41.5 / 45.7)  | 3.1  | 1      |
| K/A Category Point Totals:       | 5  | 1  | 2  | 2  | 1  | 0  | 2  | 1  | 2  | 2  | 2 | Group Point Total:  |      | 20     |

| ES-401                                    | PWR RO Examination Outline     |    |    |    |    |    |    |    |    |    |   | Form ES-401-4  |      |        |
|---|--------------------------------|----|----|----|----|----|----|----|----|----|---|--|------|--------|
|   | Plant Systems - Tier 2/Group 3 |    |    |    |    |    |    |    |    |    |   |  |      |        |
| System # / Name                           | K1                             | K2 | K3 | K4 | K5 | K6 | A1 | A2 | A3 | A4 | G | K/A Topic(s)   | Imp. | Points |
| 005 Residual Heat Removal                 |                                |    |    | X  |    |    |    |    |    |    |   | K4.01 Knowledge of RHRS design feature(s) and/or interlock(s) which provide or the following: Overpressure mitigation system. (CFR: 41.7)  | 3.0  | 1      |
| 007 Pressurizer Relief/Quench Tank        |                                |    |    |    |    |    |    |    |    | X  |   | A4.10 Ability to manually operate and/or monitor in the control room: Recognition of leaking PORV/code safety. (CFR: 41.7 / 45.5 to 45.8)  | 3.6  | 1      |
| 008 Component Cooling Water               | X                              |    |    |    |    |    |    |    |    |    |   | K1.02 Knowledge of the physical connections and/or cause-effect relationships between the CCWS and the following systems: Loads cooled by CCWS. (CFR: 41.2 to 41.9 / 45.7 to 45.9) | 3.3  | 1      |
| 027 Containment Iodine Removal            |                                |    |    |    | X  |    |    |    |    |    |   | K5.01 Knowledge of the operational implications of the following concepts as they apply to the CIRS: Purpose of charcoal filters. (CFR: 41.7 / 45.7)                               | 3.1  | 1      |
| 028 Hydrogen Recombiner and Purge Control |                                |    |    |    |    | X  |    |    |    |    |   | K6.01 Knowledge of the effect of a loss or malfunction on the following will have on the HRPS: Hydrogen recombiners. (CFR: 41.7 / 45.7)  | 2.6  | 1      |
| 034 Fuel Handling Equipment               |                                |    |    |    |    |    |    |    |    |    | X | 2.2.26 - Knowledge of refueling administrative requirements. (CFR: 43.5/ 45.13)  | 2.5  | 1      |
| 041 Steam Dump/Turbine Bypass Control     |                                |    |    |    |    |    |    |    |    |    |   | Eliminated through random selection process.   | N/A  | 0      |
| 045 Main Turbine Generator                |                                |    | X  |    |    |    |    |    |    |    |   | K3.01 Knowledge of the effect that a loss or malfunction of the MT/G system will have on the following: Remainder of the plant. (CFR: 41.7 / 45.6)                                 | 2.9  | 1      |
| 076 Service Water                         |                                |    |    |    |    |    |    |    |    |    |   | Eliminated through random selection process.   | N/A  | 0      |
| 078 Instrument Air                        |                                |    |    |    |    |    |    |    | X  |    |   | A3.01 Ability to monitor automatic operation of the IAS, including: Air pressure. (CFR: 41.7 / 45.5)   | 3.1  | 1      |
| 103 Containment                           |                                |    |    |    |    |    |    |    |    |    |   | Eliminated through random selection process.   | N/A  | 0      |
| K/A Category Point Totals:                | 1                              | 0  | 1  | 1  | 1  | 1  | 0  | 0  | 1  | 1  | 1 | Group Point Total:   |      | 8      |

| Facility: Waterford 3 |        | Date of Exam: January 18, 2002   | Exam Level: RO |        |
|-----------------------|--------|--|----------------|--------|
| Category              | K/A #  | Topic  | Imp.           | Points |
| Conduct of Operations | 2.1.8  | Ability to coordinate personnel activities outside the control room. (CFR: 45.5 / 45.12 / 45.13)   | 3.8            | 1      |
|                       | 2.1.16 | Ability to operate plant phone, paging system, and two-way radio. (CFR: 41.10 / 45.12 )  | 2.9            | 1      |
|                       | 2.1.21 | Ability to obtain and verify controlled procedure copy. (CFR: 45.10 / 45.13)   | 3.1            | 1      |
|                       | 2.1.23 | Ability to perform specific system and integrated plant procedures during all modes of plant operation. (CFR: 45.2 / 45.6)                         | 3.9            | 1      |
|                       | Total  |  |                |        |
| Equipment Control     | 2.2.12 | Knowledge of surveillance procedures. (CFR: 41.10/ 45.13)  | 3.0            | 1      |
|                       | 2.2.24 | Ability to analyze the affect of maintenance activities on LCO status. (CFR: 43.2 / 45.13)   | 2.6            | 1      |
|                       | 2.2.33 | Knowledge of control rod programming. (CFR: 43.6)  | 2.5            | 1      |
|                       | Total  |  |                |        |
| Radiation Control     | 2.3.2  | Knowledge of facility ALARA program. (CFR: 41.12 /43.4 / 45.9/45.10)   | 2.5            | 1      |
|                       | 2.3.4  | Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. (CFR: 43.4 / 45.10 ) | 2.5            | 1      |
|                       | 2.3.10 | Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. (CFR: 43.4 / 45.10)                    | 2.9            | 1      |
|                       | Total  |  |                |        |

| Facility: Waterford 3         |        | Date of Exam: January 18, 2002   | Exam Level: RO |        |
|-------------------------------|--------|--|----------------|--------|
| Category                      | K/A #  | Topic  | Imp.           | Points |
| Emergency Procedures/<br>Plan | 2.4.4  | Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. (CFR: 41.10 / 43.2 / 45.6) | 4.0            | 1      |
|                               | 2.4.16 | Knowledge of EOP implementation hierarchy and coordination with other support procedures. (CFR: 41.10 / 43.5 / 45.13)  | 3.0            | 1      |
|                               | 2.4.29 | Knowledge of the emergency plan. (CFR: 43.5 / 45.11)   | 2.6            | 1      |
|                               | Total  |  |                |        |
| Tier 3 Point Total            |        |  |                | 13     |