Tier / Group	Randomly Selected K/A	Reason for Rejection
1/2 RO	003/AK3.03	**Knowledge of the reasons for the following responses as they apply to the Dropped Control Rod: Turbine automatic runback with reactor in order to balance power output.** Rejected due to KA not applicable to Waterford 3 and similarities with Operating Test. Replaced with 005/AK3.04
2/2 RO	028/K2.01	**Knowledge of bus power supplies to the following: Hydrogen Recombiners.** Rejected due to over sampling of power supply K/As. A3 was not originally selected for Tier 2 group 2, No A3 K/As existed for 028. Replaced with 041/A3.02
1/1 SRO	054/AA2.02	**Ability to determine and interpret the following as they apply to the Loss of Main Feedwater (MFW): Differentiation between loss of all MFW and trip of one MFW pump.** Rejected due to similarity with Operational Exam. Replaced with AA2.06
2/1 SRO	061/A2.01	**Ability to (a) predict the impacts of the following malfunctions or operations on the AFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Startup of MFW pump during AFW operation.** Rejected due to Low Operational value for discriminatory SRO level question. Replaced with A2.03

Suppressed K/As

Printed: 07/11/2006

Facility: Waterford 3

		Basis	IMPORTANCE RO / SRO
025	**Ice Condenser System**		
K1	**Knowledge of the physical connections and/or cause-effect relationships between the Ice Condenser System and the following systems:**		
K1.01	Containment ventilation		2.7*/2.7*
K1.02	Refrigerant systems		2.7*/2.7*
K1.03	Containment sump system		3.2*/3.0*
K2.01	Containment ventilation fans and dampers		2.2*/2.7*
K2.02	Refrigerant systems		2.0*/2.5*
K2.03	Isolation valves		2.0*/2.2*
K3.01	Containment		3.8*/3.8*
K4.01	Glycol expansion tank levels and ice condenser system containment isolation valves		2.2*/2.5*
K4.02	System control		2.8*/3.0*
K5.01	Relationships between pressure and temperature		3.0*/3.4*
K5.02	Heat transfer		2.6*/2.8*
K5.03	Gas laws		2.4*/2.8*
K6.01	Upper and lower doors of the ice condenser		3.4*/3.6*
A1.01	Temperature chart recorders		3.0*/3.0*
A1.02	Glycol expansion tank level		2.5*/2.2*
A1.03	Glycol flow to ice condenser air handling units		2.5*/2.5*
A2.01	Trip of glycol circulation pumps		2.2*/2.7*
A2.02	High/low floor cooling temperature		2.7*/2.5*
A2.03	Opening of ice condenser doors		3.0*/3.2*
A2.04	Containment isolation		3.0*/3.2*
A2.05	Abnormal glycol expansion tank level		2.5*/2.7*
A2.06	Decreasing ice condenser temperature		2.5*/2.7*
A3.01	Refrigerant system		3.0*/3.0*
A3.02	Isolation valves		3.4*/3.4*
A4.01	Ice condenser isolation valves		3.0*/2.7*
A4.02	Containment vent fans		2.7*/2.5*
A4.03	Glycol circulation pumps		2.2*/2.2*
2.1.1	Knowledge of conduct of operations requirements.		3.7/3.8
2.1.10	Knowledge of conditions and limitations in the facility license.		2.7/3.9
2.1.11	Knowledge of less than one hour technical specification action statements for systems.		3.0/3.8
2.1.12	Ability to apply technical specifications for a system.		2.9/4.0
2.1.13	Knowledge of facility requirements for controlling vital / controlled access.		2.0/2.9
2.1.14	Knowledge of system status criteria which require the notification of plant personnel.		2.5/3.3
2.1.15	Ability to manage short-term information such as night and standing orders.		2.3/3.0
2.1.16	Ability to operate plant phone, paging system, and two-way radio.		2.9/2.8
2.1.17	Ability to make accurate, clear and concise verbal reports.		3.5/3.6
2.1.18	Ability to make accurate, clear and concise logs, records, status boards, and reports.		2.9/3.0
2.1.19	Ability to use plant computer to obtain and evaluate parametric information on system or component status.		3.0/3.0
2.1.2	Knowledge of operator responsibilities during all modes of plant operation.		3.0/4.0

Facility: Waterford 3

		Basis	IMPORTANCE RO / SRO
025	**Ice Condenser System**		
2.1	**Conduct of Operations**		
2.1.20	Ability to execute procedure steps.		4.3/4.2
2.1.21	Ability to obtain and verify controlled procedure copy.		3.1/3.2
2.1.22	Ability to determine Mode of Operation.		2.8/3.3
2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.		3.9/4.0
2.1.24	Ability to obtain and interpret station electrical and mechanical drawings.		2.8/3.1
2.1.25	Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data.		2.8/3.1
2.1.26	Knowledge of non-nuclear safety procedures (e.g. rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen).		2.2/2.6
2.1.27	Knowledge of system purpose and or function.		2.8/2.9
2.1.28	Knowledge of the purpose and function of major system components and controls.		3.2/3.3
2.1.29	Knowledge of how to conduct and verify valve lineups.		3.4/3.3
2.1.3	Knowledge of shift turnover practices.		3.0/3.4
2.1.30	Ability to locate and operate components, including local controls.		3.9/3.4
2.1.31	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup.		4.2/3.9
2.1.32	Ability to explain and apply all system limits and precautions.		3.4/3.8
2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.		3.4/4.0
2.1.34	Ability to maintain primary and secondary plant chemistry within allowable limits.		2.3/2.9
2.1.4	Knowledge of shift staffing requirements.		2.3/3.4
2.1.5	Ability to locate and use procedures and directives related to shift staffing and activities.		2.3/3.4
2.1.6	Ability to supervise and assume a management role during plant transients and upset conditions.		2.1/4.3
2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.		3.7/4.4
2.1.8	Ability to coordinate personnel activities outside the control room.		3.8/3.6
2.1.9	Ability to direct personnel activities inside the control room.		2.5/4.0
2.2.1	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.		3.7/3.6
2.2.10	Knowledge of the process for determining if the margin of safety, as defined in the basis of any technical specification is reduced by a proposed change, test or experiment.		1.9/3.3
2.2.11	Knowledge of the process for controlling temporary changes.		2.5/3.4*
2.2.12	Knowledge of surveillance procedures.		3.0/3.4
2.2.13	Knowledge of tagging and clearance procedures.		3.6/3.8
2.2.14	Knowledge of the process for making configuration changes.		2.1/3.0
2.2.15	Ability to identify and utilize as-built design and configuration change documentation to ascertain expected current plant configuration and operate the plant.		2.2/2.9
2.2.16	Knowledge of the process for making of field changes.		1.9/2.6*
2.2.17	Knowledge of the process for managing maintenance activities during power operations.		2.3/3.5
2.2.18	Knowledge of the process for managing maintenance activities during shutdown operations.		2.3/3.6
2.2.19	Knowledge of maintenance work order requirements.		2.1/3.1

Facility: Waterford 3

		Basis	IMPORTANCE RO / SRO
025	**Ice Condenser System**		
2.2	**Equipment Control**		
2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.		4.0/3.5
2.2.20	Knowledge of the process for managing troubleshooting activities.		2.2/3.3
2.2.21	Knowledge of pre- and post-maintenance operability requirements.		2.3/3.5
2.2.22	Knowledge of limiting conditions for operations and safety limits.		3.4/4.1
2.2.23	Ability to track limiting conditions for operations.		2.6/3.8
2.2.24	Ability to analyze the affect of maintenance activities on LCO status.		2.6/3.8
2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.		2.5/3.7
2.2.26	Knowledge of refueling administrative requirements.		2.5/3.7
2.2.27	Knowledge of the refueling process.		2.6/3.5
2.2.28	Knowledge of new and spent fuel movement procedures.		2.6/3.5
2.2.29	Knowledge of SRO fuel handling responsibilities.		1.6/3.8
2.2.3	(multi-unit) Knowledge of the design, procedural, and operational differences between units.		3.1/3.3
2.2.30	Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area, communication with fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.		3.5/3.3
2.2.31	Knowledge of procedures and limitations involved in initial core loading.		2.2/2.9*
2.2.32	Knowledge of the effects of alterations on core configuration.		2.3/3.3
2.2.33	Knowledge of control rod programming.		2.5/2.9
2.2.34	Knowledge of the process for determining the internal and external effects on core reactivity.		2.8/3.2*
2.2.4	(multi-unit) Ability to explain the variations in control board layouts, systems, instrumentation and procedural actions between units at a facility.		2.8/3.0*
2.2.5	Knowledge of the process for making changes in the facility as described in the safety analysis report.		1.6/2.7
2.2.6	Knowledge of the process for making changes in procedures as described in the safety analysis report.		2.3/3.3
2.2.7	Knowledge of the process for conducting tests or experiments not described in the safety analysis report.		2.0/3.2
2.2.8	Knowledge of the process for determining if the proposed change, test, or experiment involves an unreviewed safety question.		1.8/3.3
2.2.9	Knowledge of the process for determining if the proposed change, test or experiment increases the probability of occurrence or consequences of an accident during the change, test or experiment.		2.0/3.3
2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements.		2.6/3.0
2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.		2.9/3.3
2.3.11	Ability to control radiation releases.		2.7/3.2
2.3.2	Knowledge of facility ALARA program.		2.5/2.9
2.3.3	Knowledge of SRO responsibilities for auxiliary systems that are outside the control room (e.g., waste disposal and handling systems).		1.8/2.9
2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.		2.5/3.1

Facility: Waterford 3

		Basis	IMPORTANCE RO / SRO
025	**Ice Condenser System**		
2.3	**Radiological Controls**		
2.3.5	Knowledge of use and function of personnel monitoring equipment.		2.3/2.5
2.3.6	Knowledge of the requirements for reviewing and approving release permits.		2.1/3.1
2.3.7	Knowledge of the process for preparing a radiation work permit.		2.0/3.3
2.3.8	Knowledge of the process for performing a planned gaseous radioactive release.		2.3/3.2
2.3.9	Knowledge of the process for performing a containment purge.		2.5/3.4
2.4.1	Knowledge of EOP entry conditions and immediate action steps.		4.3/4.6
2.4.10	Knowledge of annunciator response procedures.		3.0/3.1
2.4.11	Knowledge of abnormal condition procedures.		3.4/3.6
2.4.12	Knowledge of general operating crew responsibilities during emergency operations.		3.4/3.9
2.4.13	Knowledge of crew roles and responsibilities during EOP flowchart use.		3.3/3.9
2.4.14	Knowledge of general guidelines for EOP flowchart use.		3.0/3.9
2.4.15	Knowledge of communications procedures associated with EOP implementation.		3.0/3.5
2.4.16	Knowledge of EOP implementation hierarchy and coordination with other support procedures.		3.0/4.0
2.4.17	Knowledge of EOP terms and definitions.		3.1/3.8
2.4.18	Knowledge of the specific bases for EOPs.		2.7/3.6
2.4.19	Knowledge of EOP layout, symbols, and icons.		2.7/3.7
2.4.2	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. Note: The issue of setpoints and automatic safety features is not specifically covered in the systems sections.		3.9/4.1
2.4.20	Knowledge of operational implications of EOP warnings, cautions, and notes.		3.3/4.0
2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions including: 1. Reactivity control; 2. Core cooling and heat removal; 3. Reactor coolant system integrity; 4. Containment conditions; 5. Radioactivity release control.		3.7/4.3
2.4.22	Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.		3.0/4.0
2.4.23	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.		2.8/3.8
2.4.24	Knowledge of loss of cooling water procedures.		3.3/3.7
2.4.25	Knowledge of fire protection procedures.		2.9/3.4
2.4.26	Knowledge of facility protection requirements including fire brigade and portable fire fighting equipment usage.		2.9/3.3
2.4.27	Knowledge of fire in the plant procedure.		3.0/3.5
2.4.28	Knowledge of procedures relating to emergency response to sabotage.		2.3/3.3
2.4.29	Knowledge of the emergency plan.		2.6/4.0
2.4.3	Ability to identify post-accident instrumentation.		3.5/3.8
2.4.30	Knowledge of which events related to system operations/status should be reported to outside agencies.		2.2/3.6
2.4.31	Knowledge of annunciators alarms and indications, and use of the response instructions.		3.3/3.4
2.4.32	Knowledge of operator response to loss of all annunciators.		3.3/3.5
2.4.33	Knowledge of the process used track inoperable alarms.		2.4/2.8
2.4.34	Knowledge of RO tasks performed outside the main control room during emergency operations including system geography and system implications.		3.8/3.6

Suppressed K/As

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Facility: Waterford 3

		Basis	IMPORTANCE RO / SRO
025	**Ice Condenser System**		
2.4	**Emergency Procedures/Plan**		
2.4.35	Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications.		3.3/3.5
2.4.36	Knowledge of chemistry / health physics tasks during emergency operations.		2.0/2.8
2.4.37	Knowledge of the lines of authority during an emergency.		2.0/3.5
2.4.38	Ability to take actions called for in the facility emergency plan, including (if required) supporting or acting as emergency coordinator.		2.2/4.0
2.4.39	Knowledge of the RO's responsibilities in emergency plan implementation.		3.3/3.1
2.4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.		4.0/4.3
2.4.40	Knowledge of the SRO's responsibilities in emergency plan implementation.		2.3/4.0
2.4.41	Knowledge of the emergency action level thresholds and classifications.		2.3/4.1
2.4.42	Knowledge of emergency response facilities.		2.3/3.7
2.4.43	Knowledge of emergency communications systems and techniques.		2.8/3.5
2.4.44	Knowledge of emergency plan protective action recommendations.		2.1/4.0
2.4.45	Ability to prioritize and interpret the significance of each annunciator or alarm.		3.3/3.6
2.4.46	Ability to verify that the alarms are consistent with the plant conditions.		3.5/3.6
2.4.47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.		3.4/3.7
2.4.48	Ability to interpret control room indications to verify the status and operation of system, and understand how operator actions and directives affect plant and system conditions.		3.5/3.8
2.4.49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.		4.0/4.0
2.4.5	Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.		2.9/3.6
2.4.50	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.		3.3/3.3
2.4.6	Knowledge symptom based EOP mitigation strategies.		3.1/4.0
2.4.7	Knowledge of event based EOP mitigation strategies.		3.1/3.8
2.4.8	Knowledge of how the event-based emergency/abnormal operating procedures are used in conjunction with the symptom-based EOPs.		3.0/3.7
2.4.9	Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.		3.3/3.9

Facility: Waterford 3	**Date of Examination: 11/13/2006**
Exam Level: RO ☐ SRO-I ☐ SRO-U ☒	**Operating Test No.: 1**

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

System / JPM Title	Type Code*	Safety Function
a.		
b. Perform Actions on a Recirculation Actuation	A, D, L, P, S	2
c.		
d.		
e.		
f. Restore Normal Power to a 4.16KV Safety Bus	A, D, S	6
g. Reset CSAS Actuation	D, S	7
h.		

In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i. Operate the Atmospheric Dump Valves Locally	A, D, E, L	4
j.		
k. Place GDT on Decay	M, R	9

@ All control room (and in-plant) systems must be different and serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

Facility: Waterford 3 **Date of Examination:** 11/13/2006

Examination Level: RO ☐ SRO ☒ **Operating Test Number:** 1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, N	Review OP-004-015 Attachment 11.1, Manual CEA Subgroup Selection.
Conduct of Operations	R,N	Determine if hours worked exceed guidelines Requirements.
Equipment Control	R, N	Perform an SRO review of OP-903-001 Attachment 11.15, Containment Pressure calculation.
Radiation Control	R, N	Review OP-901-131 Attachment 1, Containment Closure checklist.
Emergency Plan	S,M	Determine E-Plan classification and notification requirements based on current simulator scenario.

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, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

Facility: Waterford 3	**Date of Examination: 11/13/2006**
Exam Level: RO ☒ SRO-I ☐ SRO-U ☐	**Operating Test No.: 1**

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

System / JPM Title	Type Code*	Safety Function
a. Recovery of Dropped Rod	A, D, P, S	1
b. Perform Actions on a Recirculation Actuation	A, D, L, P, S	2
c. ATC immediate Operator Actions on CR evacuation	A, D, P, S	3
d. Start Reactor Coolant Pump	A, L, M, S	4
e. Place Hydrogen Recombiner in service	D, C	5
f. Restore Normal Power to a 4.16KV Safety Bus	A, D, S	6
g. Reset CSAS Actuation	D, S	7
h. Restoration From Control Room Isolation	D, S	8
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Operate the Atmospheric Dump Valves Locally	A, D, E, L	4
j. Perform a SUPS A Startup	D	6
k. Place GDT on Decay	M, R	9

@ All control room (and in-plant) systems must be different and serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(L)ow-Power / **Shutdown**	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

Facility: Waterford 3 **Date of Examination:** 11/13/2006
Examination Level: RO ☒ SRO ☐ **Operating Test Number:** 1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, N	Perform OP-004-015 Attachment 11.1 Manual CEA Subgroup Selection.
Conduct of Operations	R, N	Evaluate Proposed Work Schedule Against Established Overtime Guidelines
Equipment Control	R, N	Perform OP-903-001 Attachment 11.15 Containment Pressure calculation.
Radiation Control	R,N	Determine Stay Times to Operate Equipment in a High Dose Field.
Emergency Plan		Not selected

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, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

Facility: Waterford III Scenario No.: 3 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: IC-10 100%, BOC

Turnover: RCP 1A Middle Seal failed 8 hours ago (RC09A). EFW Pump A tagged out and is expected to be returned to service by the end of shift. HPSI Pump A is tagged out and is expected to be returned to service within 24 hours.

Event No.	Malf. No.	Event Type*	Event Description
1	NI01G	I(ALL)	After the crew takes the shift ENI Channel C Middle Detector fails low energizing Startup Channel 1. The crew should de-energize SU Channel 1. The crew should enter TS 3.3.1 & 3.3.3.6 and bypass affected trip bistables.
2	RC21A	I(ALL)	A loop 1 T_{hot} instrument fails low affecting pressurizer level setpoint. This event requires implementation of OP-901-110, Pressurizer Level Malfunction Off-Normal procedure.
3	CC03A	C(BOP/SRO)	CCW Pump A bearing seizes and the pump trips. The BOP will start CCW Pump AB to replace A. Since the AB buses are aligned to the B side, this will require entry into TS 3.7.3 and cascading TS per OP-100-014.
4	RC08A	C(RO/SRO)	The pressure surge on the system causes RCP 1A Lower Seal to fail. The crew should trip the reactor and secure RCP 1A to comply with OP-901-130.
5	RP01A RP01B RP01C	I(RO)	The manual reactor trip will fail and the RO will trip the reactor by alternate means.
6	FW07B	I(BOP)	EFW Pump B will fail to auto start, requiring the BOP to manually start the pump.
7	SG01A (20%)	M(ALL)	After the trip a SGTR occurs in SG #1. The crew will enter OP-902-007. Once the crew isolates SG #1, the scenario may be terminated.

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

Facility: Waterford III Scenario No.: 2 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: IC-30 100%, EOC

Turnover: RCP 1A Middle Seal failed 8 hours ago (RC09A). EFW Pump A is tagged out and is expected to be returned to service by the end of shift. HPSI Pump A is tagged out and is expected to be returned to service within 24 hours.

Event No.	Malf. No.	Event Type*	Event Description
1	RD02A82	R(RO) C(BOP/SRO)	CEA 82 drops into the core. The crew should implement OP-901-102. To comply with TS 3.1.3.1 the crew implements OP-901-212 for a rapid power reduction within 15 minutes.
2	RC23B (0.01%)	C(SRO)	After the crew satisfies the reactivity manipulation, an RCS leak develops inside Containment. The crew should enter TS 3.4.5.2.
3	CV02A CV02C	I(RO)	Charging Pumps AB and A fail to auto start on lowering Pressurizer level. The RO should start pumps as directed by the SRO.
4	MS09A	I(BOP/SRO)	SG #1 Steam Flow instrument, FW-IFR-1011, fails low. The crew should enter OP-901-201 and manually control feedwater flow. The Ultrasonic Flowmeter goes bad due to the FW flow transient and the crew should enter TRM 3.3.5. Note: the crew has 1 minute 17 seconds to respond to this failure or the plant will trip on low SG level.
5	RC23B (0.1%)	M(ALL)	The leak grows to a SB LOCA over a 10 minute period. The crew should manually trip the reactor and manually initiate SIAS and CIAS.
6	SI02B SI16G	I(BOP)	HPSI Pump B fails to auto start and SI-227B fails to Open. The BOP should manually start HPSI Pump B and open SI-227B. The crew may commence a cooldown with the ADVs.
7	RP05B3 RP05C3 RP05D3	I(RO)	CSAS fails to initiate when containment pressure reaches 17.7 psia. The RO should recognize this and manually initiate CSAS. Once the RO secures RCPs following CSAS, the scenario may be terminated.

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

Facility: Waterford III Scenario No.: 1 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: IC-19 70%, MOC

Turnover: EFW Pump A tagged out and is expected to be returned to service by the end of shift. HPSI Pump A is tagged out and is expected to be returned to service within 24 hours. MFW Pump B has recently been returned to service following emergent maintenance. Plant is ready to restore power to 100%.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R(RO) N(BOP/SRO)	Crew performs a brief and commences power escalation toward 100% power.
2	SG07D2	I(BOP/SRO)	SG 2 Channel D low pressure trip setpoint fails high. The crew should enter TS 3.3.1 and 3.3.2 and take required actions to bypass SG Pressure Low and SG ΔP 1 and 2 (EFAS) in PPS Channel D.
3	CV12A2	I(RO/SRO)	After the crew satisfies the reactivity manipulation, the VCT level transmitter fails low causing Charging Pump suction to swap from the VCT to the RWSP. The crew should implement OP-901-113 and secure Charging and Letdown to secure from inadvertent boration. The crew should enter TS 3.1.2.4 due to placing Charging Pump C/S to OFF (may enter 3.0.3 if they take all Pumps to OFF).
4	FW32B	C(SRO)	MFW Pump B lube oil pipe leak, which causes the crew to commence power reduction. During the power reduction brief the oil leak worsens and trips MFW Pump B.
5	PW02	I(RO/SRO)	An automatic reactor power cutback fails to occur, and the crew trips the reactor.
6	RD11A03 RD11A82	C(RO)	CEAs 3 and 82 stick out on the trip, which causes the RO to emergency borate due to two stuck CEAs.
7	ED01A ED01B ED01C ED01D EG09B	C(BOP) M(ALL)	A LOOP occurs 1 minute after the trip, and EDG B Output breaker fails to close and cannot be closed. The crew will implement SPTAs and will be directed to OP-902-003.
8	FW05	C(BOP/SRO)	After the crew performs Step 7 to Protect Main Condenser, the AB EFW Pump trips on overspeed and cannot be restored. The crew will transition to OP-902-008 due to a loss of all feedwater. Once safety function priorities are evaluated, EDG B Output breaker is restored and can be closed. Once closed, the B EFW Pump may be used to feed SGs.

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

Facility: Waterford 3 Date of Exam: 11/10/2006

Tier	Group	RO K/A Category Points												SRO – Only Points		
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2	G*	TOTAL
1. Emergency & Abnormal Plant Evolutions	1													3	3	6
	2													2	2	4
	Tier Totals													5	5	10
2. Plant Systems	1													3	2	5
	2													K5: 1 / 1	1	3
	Tier Totals													5	3	8

3. Generic Knowledge and Abilities	1	2	3	4		1	2	3	4	7
						2	2	2	1	

Note:
1. Ensure that at least two topics from every K/A category are sampled within each tier of the RO Outline (i.e., the "Tier Totals" in each K/A category shall not be less than two). Refer to Section D.1.c for additional guidance regarding SRO sampling.
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. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system or evolution unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
6.* 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. The SRO K/As must also be linked to 10 CFR 55.43 or an SRO-level learning objective.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) 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; summarize all the SRO-only knowledge and non-A2 ability categories in the columns labeled "K" and "A". Use duplicate pages for RO and SRO-only exams.
8. For Tier 3, enter the K/A number, descriptions, importance ratings, and point totals on Form ES-401-3.
9. Refer to ES-401, *-Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.

ES-401	PWR Examination Outline	Form ES-401-2
	Emergency and Abnormal Plant Evolutions – Tier1 / Group 1 (SRO)	

	E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
76.	00007 (BW/E02 & E10; CE/E02) Reactor Trip – Stabilization – Recovery / 1					x		EA2.1 Ability to determine and interpret the following as they apply to the (Reactor Trip Recovery) Facility conditions and selection of appropriate procedures during abnormal and emergency operations. (CFR: 43.5)	3.7	1
77.	000011 Large Break LOCA / 3						x	2.4.1 Knowledge of EOP entry conditions and immediate action steps. (CFR: 43.5)	4.6	1
78.	000026 Loss of Component Cooling Water / 8 operations risk assessment						x	2.2.17; Knowledge of the process for managing maintenance activities during power operations. (CFR: 43.5)	3.5	1
79.	000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4					x		AA2.05 Ability to determine and interpret the following as they apply to the Steam Line Rupture: When ESFAS systems may be secured (CFR: 43.5)	4.5	1
80.	000054 (CE/E06) Loss of Main Feedwater / 4					x		AA2.06; Ability to determine and interpret the following as they apply to the Loss of Main Feedwater (MFW): AFW adjustments needed to maintain proper T-ave. and S/G level . . (CFR: 43.5)	4.3	1
81.	000055 Station Blackout / 6						x	2.2.25; Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. (CFR: 43.2)	3.7	1
	K/A Category Totals:					3	3	Group Point Total:		6

ES-401	PWR Examination Outline	Form ES-401-2

Emergency and Abnormal Plant Evolutions – Tier 1 / Group 2 (SRO)

E/APE # / Name / Safety Function		K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
82.	000001 Continuous Rod Withdrawal / 1					x		AA2.04 - Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal : Reactor power and its trend (CFR: 43.6)	4.3	1
83.	000037 Steam Generator Tube Leak / 3						x	2.1.34 - Ability to maintain primary and secondary plant chemistry within allowable limits. (CFR: 43.2)	2.9	1
84.	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)	4.1	1
85.	000061 ARM System Alarms / 7						x	2.3.1 Knowledge of 10 CFR: 20 and related facility radiation control requirements. (CFR: 43.4)	3.0	1
K/A Category Totals:						2	2	Group Point Total:		4

ES-401	PWR Examination Outline	Form ES-401-2

Plant systems – Tier 2 / Group 1 (SRO)

	System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
86.	004 Chemical and Volume Control											x	2.1.33 - Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. (CFR: 43.2)	4.0	1
87.	007 Pressurizer Relief/ Quench Tank											x	2.3.10 - Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. (CFR: 43.4)	3.3	1
88.	013 Engineered Safety Features Actuation								x				A2.04 - 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 instrument bus (CFR: 43.2)	4.2	1
89.	061 Auxiliary/Emergency Feedwater								x				A2.03-Ability to (a) predict the impacts of the following malfunctions or operations on the AFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of dc power (CFR: 43.5)	3.4	1
90.	062 AC Electrical Distribution								x				A2.12 Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Restoration of power to a system with a fault on it . (CFR: 43.5)	3.6	1
	K/A Category Totals:								3			2	Group Point Total:		5

ES-401	PWR Examination Outline	Form ES-401-2

Plant systems – Tier 2 / Group 2 (SRO)

	System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
91.	034 Fuel Handling Equipment					x							K5.02- Knowledge of the operational implication of the following concepts as they apply to the Fuel Handling System: Limiting of load (CFR: 43.7)	2.6	1
92.	056 Condensate											x	2.1.34 Ability to maintain primary and secondary plant chemistry within allowable limits. ((CFR: 43.5)	2.9	1
93.	086 Fire Protection								x				A2.04-Ability to (a) predict the impacts of the following malfunctions or operations on the Fire Protection System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure to actuate the FPS when required, resulting in fire damage (CFR: 43.5)		1
K/A Category Totals:						1			1			1	Group Point Total:		3

ES-401	Generic Knowledge and Abilities Outline (Tier 3)	Form ES-401-3
Facility Waterford 3	Date of Exam: 11/12/2004	

Category		K/A #	Topic	RO		SRO-Only	
				IR	#	IR	#
1. Conduct of Operations	94.	2.1.6	Ability to supervise and assume a management role during plant transients and upset conditions. (CFR: 43.5)			4.3	1
	95.	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (CFR: 43.5)			4.4	1
		Subtotal					2
2. Equipment Control	96.	2.2.13	Knowledge of tagging and clearance procedures. (CFR: 43.2)			3.8	1
	97.	2.2.28	Knowledge of new and spent fuel movement procedures. | (CFR: 43.7)			3.5	1
		Subtotal					2
3. Radiation Control	98.	2.3.3	Knowledge of SRO responsibilities for auxiliary systems that are outside the control room (e.g., waste disposal and handling systems). (CFR: 43.4)			2.9	1
	99.	2.3.6	Knowledge of the requirements for reviewing and approving release permits. (CFR: 43.4)			3.1	1
		Subtotal					2
4. Emergency Procedures/ Plan	100	2.4.29	Knowledge of the emergency plan. (CFR: 43.5)			4.0	1
		Subtotal					1
Tier 3 Point Total							7

Facility: Waterford 3 Date of Exam: 11/10/2006

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	3				3	3			3	18			
	2	1	2	2				1	2			1	9			
	Tier Totals	4	5	5				4	5			4	27			
2. Plant Systems	1	3	2	3	3	2	2	3	3	2	2	3	28			
	2	1	0	1	1	1	1	1	1	1	1	1	10			
	Tier Totals	4	2	4	4	3	3	4	4	3	3	4	38			
3. Generic Knowledge and Abilities		1		2		3		4						1	2	3	4	
		3		2		3		2					10					

Note:

1. Ensure that at least two topics from every K/A category are sampled within each tier of the RO Outline (i.e., the "Tier Totals" in each K/A category shall not be less than two). Refer to Section D.1.c for additional guidance regarding SRO sampling.
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. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system or evolution unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
6.* 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. The SRO K/As must also be linked to 10 CFR 55.43 or an SRO-level learning objective.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) 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; summarize all the SRO-only knowledge and non-A2 ability categories in the columns labeled "K" and "A". Use duplicate pages for RO and SRO-only exams.
8. For Tier 3, enter the K/A number, descriptions, importance ratings, and point totals on Form ES-401-3.
9. Refer to ES-401, *-Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.

ES-401	PWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1 / Group 1 (RO)								Form ES-401-2	
E/APE # / Name / Safety Function		K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
1.	00007 (BW/E02 & E10; CE/E02) Reactor Trip – Stabilization – Recovery / 1	x						EK1.02 - Knowledge of the operational implications of the following concepts as they apply to the reactor trip: Shutdown margin (CFR: 41.10)	3.4	1
2.	00008 Pressurizer Vapor Space Accident / 3						x	2.2.34 - Knowledge of the process for determining the internal and external effects on core reactivity. (CFR: 41.1)	2.8	1
3.	000009 Small Break LOCA / 3			x				EK3.16 - Knowledge of the reasons for the following responses as the apply to the small break LOCA: Containment temperature, pressure, humidity and level limits (CFR: 41.5)	3.8	1
4.	000011 Large Break LOCA / 3		x					EK2.02 - Knowledge of the interrelations between a Large Break LOCA and the following: Pumps (CFR 41.7)	2.6	1
5.	000015/17 RCP Malfunctions / 4					x		AA2.02 - Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): Abnormalities in RCP air vent flow paths and/or oil cooling system (CFR: 41.14)	2.8	1
6.	000022 Loss of Rx Coolant Makeup / 2						x	2.1.24 - Ability to obtain and interpret station electrical and mechanical drawings. (CFR: 41.3)	2.8	1
7.	000025 Loss of RHR System / 4				x			AA1.01 - Ability to operate and / or monitor the following as they apply to the Loss of Residual Heat Removal System: RCS/RHRS cooldown rate (CFR 41.7)	3.6	1
8.	000026 Loss of Component Cooling Water / 8				x			AA1.07 - Ability to operate and / or monitor the following as they apply to the Loss of Component Cooling Water: Flow rates to the components and systems that are serviced by the CCWS; interactions among the components (CFR 41.7)	2.9	1
9.	000027 Pressurizer Pressure Control System Malfunction / 3	x						AK1.01 - Knowledge of the operational implications of the following concepts as they apply to Pressurizer Pressure Control Malfunctions: Definition of saturation temperature (CFR 41.14)	3.1	1
10.	000029 ATWS / 1		x					EK2.06 - Knowledge of the interrelations between the and the following an ATWS: Breakers, relays, and disconnects (CFR 41.6)	2.9	1
11.	000038 Steam Gen. Tube Rupture / 3	x						EK1.01 - Knowledge of the operational implications of the following concepts as they apply to the SGTR: Use of steam tables (CFR 41.10)	3.1	1

ES-401	PWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1 / Group 1 (RO)							Form ES-401-2	
E/APE # / Name / Safety Function		K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
12.	000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4			x				EK3.3 - Knowledge of the reasons for the following responses as they apply to the (Excess Steam Demand): Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations (CFR: 41.5)	3.8	1
13.	000054 (CE/E06) Loss of Main Feedwater / 4		x					EK2.1 -Knowledge of the interrelations between the (Loss of Feedwater) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features (CFR: 41.7)	3.3	1
14.	000055 Station Blackout / 6						x	2.4.20- Knowledge of operational implications of EOP warnings, cautions, and notes. (CFR: 41.10)	3.3	1
15.	000056 Loss of Off-site Power / 6					x		AA2.38 - Ability to determine and interpret the following as they apply to the Loss of Offsite Power: Load sequencer status lights (CFR: 41.7)	3.7	1
16.	000057 Loss of Vital AC Inst. Bus / 6			x				AK3.01 - Knowledge of the reasons for the following responses as they apply to the Loss of Vital AC Instrument Bus: Actions contained in EOP for loss of vital ac electrical instrument bus (CFR; 41.10)	4.1	1
17.	000058 Loss of DC Power / 6				x			AA1.03 - Ability to operate and / or monitor the following as they apply to the Loss of DC Power: Vital and battery bus components (CFR 41.7)	3.1	1
18.	000065 Loss of Instrument Air / 8					x		AA2.06 - Ability to determine and interpret the following as they apply to the Loss of Instrument Air: When to trip reactor if instrument air pressure is de-creasing (CFR: 41.10)	3.6 *	1
K/A Category Totals:		3	3	3	3	3	3	Group Point Total:		18

Emergency and Abnormal Plant Evolutions – Tier 1 / Group 2 (RO)

E/APE # / Name / Safety Function		K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
19.	000005 Inoperable/Stuck Control Rod / 1			x				AK3.04-Knowledge of the reasons for the following responses as they apply to the Inoperable / Stuck Control Rod: Tech-Spec limits for inoperable rods. (CFR 41.2)	3.4	1
20.	000024 Emergency Boration / 1		x					AK2.04 - Knowledge of the interrelations between the Emergency Boration and the following: Pumps (CFR 41.8)	2.6	1
21.	000033 Loss of Intermediate Range NI / 7	x						AK1.01 -Knowledge of the operational implications of the following concepts as they apply to Loss of Intermediate Range Nuclear Instrumentation: Effects of voltage changes on performance (CFR 41.2)	2.7	1
22.	000036 (BW/A08) Fuel Handling Accident / 8				x			AA1.01 - Ability to operate and / or monitor the following as they apply to the Fuel Handling Incidents: Reactor building containment purge ventilation system (CFR 41.13)	3.3	1
23.	000059 Accidental Liquid RadWaste Rel. / 9					x		AA2.02 - Ability to determine and interpret the following as they apply to the Accidental Liquid Radwaste Release: The permit for liquid radioactive-waste release (CFR: 41.13)	2.9	1
24.	000069 (W/E14) Loss of CTMT Integrity / 5					x		AA2.01 - Ability to determine and interpret the following as they apply to the Loss of Containment Integrity: Loss of containment integrity (CFR: 41.9)	3.7	1
25.	000074 Inadequate Core Cooling/ 4		x					EK2.06 - Knowledge of the interrelations between Inadequate Core Cooling and the following: Turbine bypass and atmospheric dump valves (CFR 41.5)	3.5 *	1
26.	CE/A16 Excess RCS Leakage / 2						x	2.4.10 - Knowledge of annunciator response procedures. (CFR: 41.10)	3.0	1
27.	CE/E09 Functional Recovery			x				EK3.2 - Knowledge of the reasons for the following responses as they apply to the (Functional Recovery): Normal, abnormal and emergency operating procedures associated with (Functional Recovery) (CFR: 41.10)	3.0	1
K/A Category Totals:		1	2	2	1	2	1	Group Point Total:		9

Plant Systems – Tier 2 / Group 1 (RO)

System # / Name		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
28.	003 Reactor Coolant Pump							x					A1.09 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPS controls including: Seal flow and D/P (CFR: 41.5)	2.8	1
29.	004 Chemical and Volume Control						x						K6.05 - Knowledge of the effect of a loss or malfunction on the following CVCS components: Sensors and detectors (CFR: 41.7)	2.5	1
30.	005 Residual Heat Removal					x							K5.05 - Knowledge of the operational implications of the following concepts as they apply the RHRS: Plant response during "solid plant": pressure change due to the relative incompressibility of water (CFR: 41.5)	2.7 *	1
31.	006 Emergency Core Cooling	x											K1.08 - Knowledge of the physical connections and/or cause effect relationships between the ECCS and the following systems: CVCS (CFR: 41.6)	3.6	1
32.	006 Emergency Core Cooling									x			A3.05 - Ability to monitor automatic operation of the ECCS, including: Safety Injection Pump (CFR: 41.7)	4.2	1
33.	007 Pressurizer Relief/ Quench Tank							x					A1.01 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including: Maintaining quench tank water level within limits (CFR: 41.5)	2.9	1
34.	008 Component Cooling Water		x										K2.02 - Knowledge of bus power supplies to the following: CCW pump, including emergency backup (CFR: 41.7)	3.0 *	1
35.	010 Pressurizer Pressure Control			x									K3.03 - Knowledge of the effect that a loss or malfunction of the PZR PCS will have on the following: ESFAS (CFR: 41.7)	4.0	1
36.	012 Reactor Protection									x			A3.04 - Ability to monitor automatic operation of the RPS, including: Circuit breaker (CFR: 41.6)	2.8 *	1

Plant Systems – Tier 2 / Group 1 (RO)

System # / Name		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
37.	012 Reactor Protection						x						K6.09- Knowledge of the effect of a loss or malfunction of the following will have on the RPS: CEAC (CFR: 41.6)	3.6	1
38.	013 Engineered Safety Features Actuation			x									K3.01 - Knowledge of the effect that a loss or malfunction of the ESFAS will have on the following: Fuel (CFR: 41.2)	4.4	1
39.	022 Containment Cooling								x				A2.01 - Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Fan motor over-current (CFR: 41.5)	2.5	1
40.	022 Containment Cooling										x		A4.04 - Ability to manually operate and/or monitor in the control room: Valves in the CCS (CFR: 41.7)	3.1	1
41.	026 Containment Spray	x											K1.02 - Knowledge of the physical connections and/or cause effect relationships between the CSS and the following systems: Cooling water (CFR: 41.8)	4.1	1
42.	039 Main and Reheat Steam					x							K5.01 - Knowledge of the operational implications of the following concepts as they apply to the MRSS: Definition and causes of steam/ water hammer (CFR: 41.14)	2.9	1
43.	059 Main Feedwater								x				A2.03 - Ability to (a) predict the impacts of the following malfunctions or operations on the MFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Overfeeding event (CFR: 41.5)	2.7	1

Plant Systems – Tier 2 / Group 1 (RO)

System # / Name		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
44.	061 Auxiliary/Emergency Feedwater	x											K1.03 - Knowledge of the physical connections and/or cause effect relationships between the AFW and the following systems: Main steam system (CFR: 41.4)	3.5	1
45.	062 AC Electrical Distribution				x								K4.10 - Knowledge of ac distribution system design feature(s) and/or interlock(s) which provide for the following: Uninterruptible ac power sources (CFR: 41.7)	3.1	1
46.	063 DC Electrical Distribution				x								K4.04 - Knowledge of DC electrical system design feature(s) and/ or interlock(s) which provide for the following: Trips (CFR: 41.7)	2.6 ?	1
47.	063 DC Electrical Distribution										x		A4.03 - Ability to manually operate and/or monitor in the control room: Battery discharge rate (CFR: 41.8)	3.0 *	1
48.	064 Emergency Diesel Generator				x								K4.02 - Knowledge of ED/G system design feature(s) and/or interlock(s) which provide for the following: Trips for ED/G while operating (normal or emergency) (CFR: 41.7)	3.9	1
49.	073 Process Radiation Monitoring								x				A2.02 - Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Detector failure (CFR: 41.11)	2.7	1
50.	073 Process Radiation Monitoring											x	2.4.48 -Ability to interpret control room indications to verify the status and operation of system, and understand how operator actions and directives affect plant and system conditions. (CFR: 43.12)	4.0	1

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

System # / Name		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
51.	076 Service Water							x					A1.02 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SWS controls including: Reactor and turbine building closed cooling water temperatures (CFR: 41.5)	2.6 *	1
52.	078 Instrument Air		x										K2.01 - Knowledge of bus power supplies to the following: Instrument air compressor (CFR: 41.7)	2.7	1
53.	078 Instrument Air											x	2.1.28- Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)	3.2	1
54.	103 Containment			x									K3.01 - Knowledge of the effect that a loss or malfunction of the containment system will have on the following: Loss of containment integrity under shutdown conditions (CFR: 41.9)	3.3 *	1
55.	103 Containment											x	2.1.29 - Knowledge of how to conduct and verify valve lineups. (CFR: 41.9)	3.4	1
K/A Category Totals:		3	2	3	3	2	2	3	3	2	2	3	Group Point Total:		28

Plant Systems – Tier 2 / Group 2 (RO)

System # / Name		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	IR	#
56.	001 Control Rod Drive			x									K3.02- Knowledge of the effect that a loss or malfunction of the CRDS will have on the following: RCS (CFR: 41.6)	3.4 *	1
57.	002 Reactor Coolant										x		A4.03 - Ability to manually operate and/or monitor in the control room: Indications necessary to verify natural circulation from appropriate level, flow, and temperature indications and valve positions upon loss of forced circulation (CFR: 41.5)	4.3	1
58.	011 Pressurizer Level Control							x					A1.04-Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PZR LCS controls including: Tave (CFR: 41.5)	3.1	1
59.	015 Nuclear Instrumentation						x						K6.03 - Knowledge of the effect of a loss or malfunction on the following will have on the NIS: Component interconnections (CFR: 41.2)	2.6	1
60.	016 Non-nuclear Instrumentation											x	2.1.33 - Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. (CFR: 41.5)	3.4	1
61.	029 Containment Purge								x				A2.04 - Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Health physics sampling of containment atmosphere (CFR: 41.9)	2.5	1
62.	033 Spent Fuel Pool Cooling HVF				x								K4.04 -Knowledge of design feature(s) and/or interlock(s) which provide for the following: Maintenance of spent fuel pool radiation (CFR: 41.7)	2.7	1

Plant Systems – Tier 2 / Group 2 (RO)

System # / Name		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	IR	#
63.	041 Steam Dump/Turbine Bypass Control									x			A3.02-Ability to monitor automatic operation of the SDS, including: RCS pressure, RCS temperature, and reactor power. (CFR: 41.5)	3.3	1
64.	071 Waste Gas Disposal					x							K5.04 – Knowledge of the operational implication of the following concepts as they apply to the Waste Gas Disposal System: Relationship hydrogen/ oxygen concentrations to flammability (CFR: 41.13)	2.5	1
65.	072 Area Radiation Monitoring	x											K1.05 - Knowledge of the physical connections and/or cause effect relationships between the ARM system and the following systems: MRSS (CFR: 41.11)	2.8 *	1
K/A Category Totals:		1	0	1	1	1	1	1	1	1	1	1	Group Point Total:		10

ES-401	Generic Knowledge and Abilities Outline (Tier 3)	Form ES-401-3
Facility Waterford 3	Date of Exam: 11/12/2004	

Category		K/A #	Topic	RO		SRO-Only	
				IR	#	IR	#
1. Conduct of Operations	66.	2.1.10	Knowledge of conditions and limitations in the facility license. (CFR: 41.5)	2.7	1		
	67.	2.1.25	Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data. (CFR: 41.10)	2.8	1		
	68.	2.1.32	Ability to explain and apply all system limits and precautions. (CFR: 41.5)	3.4	1		
		Subtotal			3		
2. Equipment Control	69.	2.2.27	Knowledge of the refueling process. (CFR: 41.13)	2.6	1		
	70.	2.2.34	Knowledge of the process for determining the internal and external effects on core reactivity. (CFR: 41.1)	2.8	1		
		Subtotal			2		
3. Radiation Control	71.	2.3.2	Knowledge of facility ALARA program. (CFR: 41.12)	2.5	1		
	72.	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. (CFR: 41.12)	2.5	1		
	73.	2.3.11	Ability to control radiation releases. (CFR: 41.13)	2.7	1		
		Subtotal			3		
4. Emergency Procedures/ Plan	74.	2.4.17	Knowledge of EOP terms and definitions. (CFR: 41.10)	3.1	1		
	75.	2.4.45	Ability to prioritize and interpret the significance of each annunciator or alarm. (CFR: 43.7)	3.3	1		
		Subtotal			2		
Tier 3 Point Total					10		

Written Outline K/A Selection Methodology

The following were used to generate the written examination outlines for the RO and SRO subjects:

Westinghouse Owners Group, PWR K/A DATABASE PROGRAM, JUNE 2005 VERSION 2.2.3, CE Plant Version, Developed by WD Associates for the Westinghouse Owners Group (WOG), PA-OSC-0059

- All K/As for the Ice Condenser system were suppressed. This system is not part of Waterford 3's design.
- The program filters all K/As < 2.5 for the applicable exam level.
- No other K/As were suppressed. This resulted in some K/As being replaced using a random number generator.

Waterford III used the following methodology for manually selecting replacement Knowledge/Ability (K/A) statements:

1. Selected Knowledge/Ability/Generic groups (K1-6, A1-4) should only be changed:
    - If no other K/A statements exist for the associated subject in the selected Knowledge/Ability/Generic group with a rating of > 2.5,
    - If no other K/A statements exist for the associated subject within the Knowledge/Ability/Generic group which are appropriate to be tested on the written examination,
    - To prevent low coverage of Knowledge/Ability/Generic groups.
    - To prevent over-sampling between written and operating tests.
2. Using a random number generator select a K/A statement (for example K1.01, or 2.1.1) for each of the applicable K/A statements to be replaced. The K/A statement must have an importance rating of > 2.5 and must be appropriate to be tested on the written examination.
3. K/A statements maybe replaced to ensure representative sampling of 10CFR55 requirements.