

**REVISED WRITTEN EXAMINATION OUTLINE - ES-401-1**

**FOR THE DRESDEN INITIAL EXAMINATION - FEBRUARY 2006**

Facility Name: Dresden		Date of Exam: 2/6/06																
Tier	Group	RO K/A Category Points											Total	SRO-Only Points				
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *		A2	G*	Total		
1. Emergency & Abnormal Plant Evolution	1	4	3	3	N/A			4	3	N/A			3	20	4	3	7	
	2	1	2	1	N/A			1	1	N/A			1	7	2	1	3	
	Tier Totals	5	5	4				5	4				4	27	6	4	10	
2. Plant Systems	1	2	2	2	3	2	3	3	2	2	2	3	26	3	2	5		
	2	1	1	1	2	1	1	1	1	1	1	1	12	1	1	3		
	Tier Totals	3	3	3	5	3	4	4	3	3	3	4	38	5	3	8		
3. Generic Knowledge and Abilities Categories					1		2		3		4		10	1	2	3	4	7
					2		3		3		2			2	2	2	1	

Note: 1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).

2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by  $\pm 1$  from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.

3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.

4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.

5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.

6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.

7.\* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.

8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G\* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.

9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

ES-401		BWR Examination Outline							Form ES-401-1	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO)										
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	A 3	K/A Topic(s)	IR	#	
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4				0 7			Nuclear boiler instrumentation system	3.1	1	
295003 Partial or Complete Loss of AC / 6	0 1						Effect of battery discharge rate on capacity	2.7	1	
295004 Partial or Total Loss of DC Pwr / 6			0 3				Reactor SCRAM: Plant-Specific	3.1	1	
295005 Main Turbine Generator Trip / 3	0 3						Pressure effects on reactor level	3.5	1	
295006 SCRAM / 1					0 4		Reactor pressure	4.1	1	
295016 Control Room Abandonment / 7						0 4 4	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4	1	
295018 Partial or Total Loss of CCW / 8					0 4		System flow	2.9	1	
295019 Partial or Total Loss of Inst. Air / 8				0 2		0 4 0	Instrument air system valves: Plant-Specific; Knowledge of operator responsibilities during all modes of plant operation.	3.3; 3	2	
295021 Loss of Shutdown Cooling / 4				0 1			Reactor water cleanup system	3.4	1	
295023 Refueling Acc / 8		0 3					Radiation monitoring equipment	3.4	1	
295024 High Drywell Pressure / 5		0 1					HPCI (FWCI): Plant-Specific	3.9	1	
295025 High Reactor Pressure / 3	0 6						Pressure effects on reactor water level	3.5	1	
295026 Suppression Pool High Water Temp. / 5						0 4 4	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4	1	
295027 High Containment Temperature / 5							Not applicable to Dresden		0	
295028 High Drywell Temperature / 5	0 1						Reactor water level measurement	3.5	1	
295030 Low Suppression Pool Wtr Lvl / 5		0 8					SRV discharge submergence	3.5	1	
295031 Reactor Low Water Level / 2					0 2		Reactor power	4	1	
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1			0 3				Lowering reactor water level	4.1	1	
295038 High Off-site Release Rate / 9			0 4				Emergency depressurization	3.6	1	
600000 Plant Fire On Site / 8				0 9			Plant fire zone panel (including detector location)	2.5	1	
K/A Category Totals:	4	3	3	4	3	3	Group Point Total:		20	

ES-401		BWR Examination Outline							Form ES-401-1	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO)										
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	A 3	K/A Topic(s)		IR	#
295002 Loss of Main Condenser Vac / 3										0
295007 High Reactor Pressure / 3										0
295008 High Reactor Water Level / 2										0
295009 Low Reactor Water Level / 2										0
295010 High Drywell Pressure / 5				0 6			Leakage detection systems		3.3	1
295011 High Containment Temp / 5										0
295012 High Drywell Temperature / 5			0 1				Increased drywell cooling		3.5	1
295013 High Suppression Pool Temp. / 5		0 1					Suppression pool cooling		3.6	1
295014 Inadvertent Reactivity Addition / 1										0
295015 Incomplete SCRAM / 1		0 2					RMCS: Plant-Specific		3.6	1
295017 High Off-site Release Rate / 9	0 3						Meteorological effects on off-site release		2.7	1
295020 Inadvertent Cont. Isolation / 5 & 7						0 60	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.		3.3	1
295022 Loss of CRD Pumps / 1										0
295029 High Suppression Pool Wtr Lvl / 5										0
295032 High Secondary Containment Area Temperature / 5										0
295033 High Secondary Containment Area Radiation Levels / 9					0 1		Area radiation levels		3.8	1
295034 Secondary Containment Ventilation High Radiation / 9										0
295035 Secondary Containment High Differential Pressure / 5										0
295036 Secondary Containment High Sump/Area Water Level / 5										0
500000 High CTMT Hydrogen Conc. / 5										0
K/A Category Totals:	1	2	1	1	1	1	Group Point Total:			7

BWR Examination Outline													Form ES-401-1	
Plant Systems - Tier 2/Group 1 (RO)														
E/APE # / Name / Safety Function	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
203000 RHR/LPCI: Injection Mode	1 3										0 6	Drywell pressure; System reset following automatic initiation: Plant-Specific	3.9; 3.9	2
205000 Shutdown Cooling			0 3									Reactor temperatures (moderator, vessel, flange)	3.8	1
206000 HPCI	0 6											Suppression chamber: BWR-2, 3, 4	3.7	1
207000 Isolation (Emergency) Condenser							0 9					Valve operations: BWR-2, 3	3.7	1
209001 LPCS					0 4							Heat removal (transfer) mechanisms	2.8	1
209002 HPCS												Not applicable at Dresden		0
211000 SLC							0 6					Flow indication: Plant-Specific	3.8	1
212000 RPS							0 1					RPS motor-generator output voltage	2.8	1
215003 IRM			0 2									Reactor manual control	3.6	1
215004 Source Range Monitor									0 3	0 4		RPS status; SRM drive control switches	3.6; 3.2	2
215005 APRM / LPRM		0 2										APRM channels	2.6	1
217000 RCIC												Not applicable at Dresden		0
218000 ADS					0 1						04 08	ADS logic operation; Knowledge symptom based EOP mitigation strategies.	3.8; 3.1	2
223002 PCIS/Nuclear Steam Supply Shutoff						0 5						Containment instrumentation	3	1
239002 SRVs						0 3						A.C. power: Plant-Specific	2.7	1
259002 Reactor Water Level Control						0 1						Plant air systems	3.2	1
261000 SGTS									0 4			System temperature	3	1
262001 AC Electrical Distribution				0 6							01 27	Redundant power sources to vital buses; Knowledge of system purpose and/or function.	3.6; 2.8	2
262002 UPS (AC/DC)								0 2				Over voltage	2.5	1
263000 DC Electrical Distribution		0 1										Major D.C. loads	3.1	1
264000 EDGs				0 7								Local operation and control	3.3	1
300000 Instrument Air				0 3								Securing of IAS upon loss of cooling water	2.8	1
400000 Component Cooling Water							0 2				01 33	High/Low surge tank level; Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	2.8; 3.4	2
														0
K/A Category Totals:	2	2	2	3	2	3	3	2	2	2	3	Group Point Total:		26

ES-401		BWR Examination Outline												Form ES-401-1	
Plant Systems - Tier 2/Group 2 (RO)															
E/APE # / Name / Safety Function	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#	
201001 CRD Hydraulic														0	
201002 RMCS														0	
201003 Control Rod and Drive Mechanism														0	
201004 RSCS														0	
201005 RCIS														0	
201006 RWM										0 3		Latched group indication: P-Spec(Not-BWR6)	3	1	
202001 Recirculation									0 7			Pump trips: Plant-Specific	3.3	1	
202002 Recirculation Flow Control														0	
204000 RWCU	0 5											Plant air systems	2.7	1	
214000 RPIS			0 3									RMCS: Plant-Specific	3.1	1	
215001 Traversing In-core Probe														0	
215002 RBM														0	
216000 Nuclear Boiler Inst.														0	
219000 RHR/LPCI: Torus/Pool Cooling Mode														0	
223001 Primary CTMT and Aux.					1 1							Temperature measurement	2.7	1	
226001 RHR/LPCI: CTMT Spray Mode														0	
230000 RHR/LPCI: Torus/Pool Spray Mode							0 9					Emergency generator loading	3.3	1	
233000 Fuel Pool Cooling/Cleanup	0 2											RHR pumps	2.8	1	
234000 Fuel Handling Equipment			0 2									Prevention of control rod movement during core alterations	3.3	1	
239001 Main and Reheat Steam			0 1									Automatic isolation of steam lines	3.8	1	
239003 MSIV Leakage Control														0	
241000 Reactor/Turbine Pressure Regulator														0	
245000 Main Turbine Gen. / Aux.					0 5							Stator water cooling	2.9	1	
256000 Reactor Condensate							0 3					Valve openings	2.8	1	
259001 Reactor Feedwater														0	
268000 Radwaste														0	
271000 Offgas														0	
272000 Radiation Monitoring														0	
286000 Fire Protection											01 30	Ability to locate and operate components, including local controls.	3.9	1	
288000 Plant Ventilation														0	
290001 Secondary CTMT														0	
290003 Control Room HVAC														0	
290002 Reactor Vessel Internals														0	
K/A Category Totals:	1	1	1	2	1	1	1	1	1	1	1	Group Point Total:		12	

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Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	A 3	K/A Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4									0
295003 Partial or Complete Loss of AC / 6									0
295004 Partial or Total Loss of DC Pwr / 6					0 3		Battery voltage	2.9	1
295005 Main Turbine Generator Trip / 3						0 4	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4	1
295006 SCRAM / 1									0
295016 Control Room Abandonment / 7									0
295018 Partial or Total Loss of CCW / 8						0 1	Knowledge of system status criteria which require the notification of plant personnel.	3.3	1
295019 Partial or Total Loss of Inst. Air / 8									0
295021 Loss of Shutdown Cooling / 4									0
295023 Refueling Acc / 8					0 5		Entry conditions of emergency plan	4.6	1
295024 High Drywell Pressure / 5									0
295025 High Reactor Pressure / 3					0 4		Suppression pool level	3.9	1
295026 Suppression Pool High Water Temp. / 5									0
295027 High Containment Temperature / 5									0
295028 High Drywell Temperature / 5						0 2	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1
295030 Low Suppression Pool Wtr Lvl / 5									0
295031 Reactor Low Water Level / 2									0
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1					0 7		Containment conditions/isolations	4.2	1
295038 High Off-site Release Rate / 9									0
600000 Plant Fire On Site / 8									0
K/A Category Totals:	0	0	0	0	4	3	Group Point Total:		7

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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	A 3	G	K/A Topic(s)	IR	#
295002 Loss of Main Condenser Vac / 3										0
295007 High Reactor Pressure / 3					0 2			Reactor power	4.1	1
295008 High Reactor Water Level / 2										0
295009 Low Reactor Water Level / 2										0
295010 High Drywell Pressure / 5										0
295011 High Containment Temp / 5										0
295012 High Drywell Temperature / 5										0
295013 High Suppression Pool Temp. / 5										0
295014 Inadvertent Reactivity Addition / 1										0
295015 Incomplete SCRAM / 1										0
295017 High Off-site Release Rate / 9										0
295020 Inadvertent Cont. Isolation / 5 & 7										0
295022 Loss of CRD Pumps / 1								Knowledge of system status criteria which require the notification of plant personnel.	3.3	1
295029 High Suppression Pool Wtr Lvl / 5										0
295032 High Secondary Containment Area Temperature / 5										0
295033 High Secondary Containment Area Radiation Levels / 9										0
295034 Secondary Containment Ventilation High Radiation / 9										0
295035 Secondary Containment High Differential Pressure / 5										0
295036 Secondary Containment High Sump/Area Water Level / 5					0 3			Cause of the high water level	3.8	1
500000 High CTMT Hydrogen Conc. / 5										0
K/A Category Totals:	0	0	0	0	2	1		Group Point Total:		3



ES-401		BWR Examination Outline										Form ES-401-1		
Plant Systems - Tier 2/Group 1 (SRO)														
E/APE # / Name / Safety Function	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
203000 RHR/LPCI: Injection								1 5				Loop selection logic failure: Plant-Specific	4.2	1
205000 Shutdown Cooling Mode								0 1				Recirculation loop high temperature: Plant-Specific	3.3	1
206000 HPCI														0
207000 Isolation (Emergency) Condenser														0
209001 LPCS								0 6				Inadequate system flow	3.2	1
209002 HPCS														0
211000 SLC														0
212000 RPS														0
215003 IRM														0
215004 Source Range Monitor														0
215005 APRM / LPRM														0
217000 RCIC														0
218000 ADS														0
223002 PCIS/Nuclear Steam Supply Shutoff														0
239002 SRVs											04. 06	Knowledge symptom based EOP mitigation strategies.	4	1
259002 Reactor Water Level Control											04. 49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4	1
261000 SGTS														0
262001 AC Electrical Distribution														0
262002 UPS (AC/DC)														0
263000 DC Electrical Distribution														0
264000 EDGs														0
300000 Instrument Air														0
400000 Component Cooling Water														0
K/A Category Totals:	0	0	0	0	0	0	0	0	0	0	2	Group Point Total:		5

ES-401		BWR Examination Outline												Form ES-401-1	
Plant Systems - Tier 2/Group 2 (SRO)															
E/APE # / Name / Safety Function	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#	
201001 CRD Hydraulic														0	
201002 RMCS								0				Control rod block	3.1	1	
201003 Control Rod and Drive Mechanism														0	
201004 RSCS														0	
201005 RCIS														0	
201006 RWM														0	
202001 Recirculation														0	
202002 Recirculation Flow Control														0	
204000 RWCU														0	
214000 RPIS														0	
215001 Traversing In-core Probe														0	
215002 RBM														0	
216000 Nuclear Boiler Inst.														0	
219000 RHR/LPCI: Torus/Pool Cooling Mode														0	
223001 Primary CTMT and Aux.														0	
226001 RHR/LPCI: CTMT Spray Mode														0	
230000 RHR/LPCI: Torus/Pool Spray Mode														0	
233000 Fuel Pool Cooling/Cleanup														0	
234000 Fuel Handling Equipment							0					Spent fuel pool level	3.4	1	
239001 Main and Reheat Steam														0	
239003 MSIV Leakage Control														0	
241000 Reactor/Turbine Pressure Regulator											04	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.3	1	
245000 Main Turbine Gen. / Aux.														0	
256000 Reactor Condensate														0	
259001 Reactor Feedwater														0	
268000 Radwaste														0	
271000 Offgas														0	
272000 Radiation Monitoring														0	
286000 Fire Protection														0	
288000 Plant Ventilation														0	
290001 Secondary CTMT														0	
290003 Control Room HVAC														0	
290002 Reactor Vessel Internals														0	
K/A Category Totals:	0	0	0	0	0	0	1	1	0	0	1	Group Point Total:		3	

Facility Name: Dresden		Date of Exam: 2/6/06					
Category	K/A #	Topic	RO		SRO-Only		
			IR	#	IR	#	
1. Conduct of Operations	2.1. 01	Knowledge of conduct of operations requirements.	3.7	1			
	2.1. 07	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	3.7	1			
	2.1.						
	2.1.						
	2.1. 04	Knowledge of shift staffing requirements			3.4	1	
	2.1. 22	Ability to determine Mode of Operation.			3.3	1	
	Subtotal			2		2	
2. Equipment Control	2.2. 02	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels	4	1			
	2.2. 13	Knowledge of tagging and clearance procedures.	3.6	1			
	2.2. 34	Knowledge of the process for determining the internal and external effects on core reactivity	2.8	1			
	2.2.						
	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.			2.9	1	
	2.2. 22	Knowledge of limiting conditions for operations and safety limits.			4.1	1	
	Subtotal			3		2	
3. Radiation Control	2.3. 04	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized	2.5	1			
	2.3. 10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.9	1			
	2.3. 11	Ability to control radiation releases.	2.7	1			
	2.3.						
	2.3. 02	Knowledge of facility ALARA program.			2.9	1	
	2.3. 03	Knowledge of SRO responsibilities for auxiliary systems that are outside the control room (e.g., waste disposal and handling systems).			2.9	1	
	Subtotal			3		2	
4. Emergency Procedures / Plan	2.4. 06	Knowledge symptom based EOP mitigation strategies.	3.1	1			
	2.4. 23	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.	2.8	1			
	2.4.						
	2.4. 35	Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications.			3.5	1	
	2.4.						
	2.4.						
	Subtotal			2		1	
Tier 3 Point Total				10		7	