

DUANE ARNOLD

APRIL 2001

Outline Submittal

Facility:		Date of Examination:		
Item	Task Description	Initials		
		a	b*	c
W R I T T E N	1. a. Verify that the outline(s) fit(s) the appropriate model per ES-401.	MC	Ky	AMS
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all knowledge and ability categories are appropriately sampled.	MC	Ky	AMS *
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.	MC	Ky	AMS
	d. Assess whether the repetition from previous examination outlines is excessive.	MC	Ky	AMS
S I M	2. a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, and major transients.	MC	Ky	AMS
	b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity; ensure each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s)*, and scenarios will not be repeated over successive days.	MC	Ky	AMS
	c. To the extent possible, assess whether the outline(s) conform(s) with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D.	MC	Ky	AMS
W / T	3. a. Verify that: (1) the outline(s) contain(s) the required number of control room and in-plant tasks, (2) no more than 30% of the test material is repeated from the last NRC examination, (3)* no tasks are duplicated from the applicants' audit test(s), and (4) no more than 80% of any operating test is taken directly from the licensee's exam banks.	MC	Ky	AMS
	b. Verify that: (1) the tasks are distributed among the safety function groupings as specified in ES-301, (2) one task is conducted in a low-power or shutdown condition, (3) 40% of the tasks require the applicant to implement an alternate path procedure, (4) one in-plant task tests the applicant's response to an emergency or abnormal condition, and (5) the in-plant walk-through requires the applicant to enter the RCA.	MC	Ky	AMS
	c. Verify that the required administrative topics are covered, with emphasis on performance-based activities.	MC	Ky	AMS
	d. Determine if there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on successive days.	MC	Ky	AMS
G E N E R A L	4. a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam section.	MC	Ky	AMS
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.	MC	Ky	AMS
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	MC	Ky	AMS
	d. Check for duplication and overlap among exam sections.	MC	Ky	AMS
	e. Check the entire exam for balance of coverage.	MC	Ky	AMS
	f. Assess whether the exam fits the appropriate job level (RO or SRO).	MC	Ky	AMS
a. Author		Printed Name / Signature		Date
b. Facility Reviewer(*)		Michael Fisher / Michael Fisher		1/19/2001
c. Chief Examiner		Keith Young / Keith Young		1/19/2001
d. NRC Supervisor		Ann Marie Stone / Ann Marie Stone		1/25/2001
		David E. Aile / David E. Aile		1/25/2001

(*) Not applicable for NRC-developed examinations.

* Please see note to file.

EXPLANATION OF RANDOM K/A GENERATION TECHNIQUE

(Required by NUREG 1021, ES-401 D.1.b)

GENERAL

The primary tool used for random generation of the written exam outline was the computerized K/A Catalog, Version 1.07, developed by WD Associates, Inc. This program has a feature that produces a random selection of K/As for the RO and SRO outlines.

This program has a feature that allows suppression of K/As that are not applicable to a given plant. Experimentation with the random generator feature on a catalog that was not suppressed developed an unacceptably high percentage ($\approx 20\%$) of unusable K/As. Suppression was performed and a better product resulted. A second suppression was conducted in order to prevent the selection of system oriented generic K/As in Tier 3. Future suppression will be performed as necessary. (Justification for K/A suppression is also provided.)

This program also has a feature that allows the assignment of plant specific K/A values. This feature was NOT used.

There are some known limitations in this program. When "BOTH" RO and SRO random outlines were requested, the RO outline did not select Generic K/As for Tier 2. This problem does not exist when the RO and SRO outlines are requested individually. Requesting individual RO and SRO outlines is not viable as a primary method of outline generation because it also results in virtually no overlap between exams.

"Primary Random" outlines were generated on 5/19/00 using the "BOTH" option.

"Secondary Random" outlines were developed on 12/21/00. For this set of outlines, the RO and SRO outlines were generated individually. This partially solved the problem of no Tier 2 Generic K/As for the RO exam and provided a source of replacement, randomly selected K/As.

Several other problems have been identified:

- The Primary Random outlines contained instances where some systems or evolutions had no K/As selected (a void) while others had two K/As selected (a double). This problem occurred 19 times on the RO outline and 18 times on the SRO outline. This problem was discussed with H. Peterson of the NRC who was speaking in behalf of D. Hills of the NRC. It was decided that more complete coverage was preferred over sanctity of the Primary Random outline. When the Secondary Random outline provided a K/A for a void on the Primary Random outline, that K/A was inserted and a K/A from the same category was automatically deselected from a system or evolution that had double K/As. (Thus maintaining the ES-401-1&2 totals.)
- One obvious error was that Tier 1 Group 1 of the RO outline contained 14 questions rather than the required 13.
- In Tier 2, Group 2, System 204000 (Reactor Water Cleanup) Topic A1 was selected twice.
- The SRO outline must contain ten (10) SRO only questions in Tier 3, but the Primary Random outline generated only seven (7). This limitation was identified after the initial contact with our Chief Examiner.

The submitted outlines are dated 1/19/01.

METHODOLOGY

When necessary, random selection and de-selection was performed by rolling a die (1/2 of a set of dice).

- When the selection field was greater than six (6), the field was first assigned sequential numbers and eliminated by an odd or even roll of the die. This process is repeated as often as often as necessary to reduce the field to ≤ 6 .
- When ≤ 6 K/As remained, they were assigned sequential numbers 1-6 and selected by the roll of the die.
- When there were only two items in the selection field, they were assigned odd or even designation and selected or deselected by the odd or even roll of the die.
- When deselection was necessary, the field was reduced to the systems or evolutions with double K/As selected.

For the RO outline, K/A replacement was done by taking a K/A from the Secondary Random outline.

- When there was more than one K/A in the selection field of the Secondary Random outline, the substitute K/A was randomly selected by the roll of the die as described above.
- When a replacement K/A was necessary due to a void in the Primary Random outline, the substituted K/A automatically deselected a K/A from the same category in a system or evolution with double K/As. If there was more than one system or evolution with double K/As to in the selection field, then a K/A was randomly deselected by the roll of the die as described above.

The first option for K/A replacement on the SRO outline was to take the K/A from the submitted RO outline when available. After that, random selection was performed as for the RO outline. Selection fields were sometimes limited by the need to use SRO only or RO only K/As.

SPECIFIC PROBLEMS / RESOLUTIONS

1R = Primary Random Outline

2R = Secondary Random Outline

RO

Tier 1 Group 1

1. 295015 void on 1R but selected on 2R. (Generic 2.4.49)
Inserted 295015 Generic 2.4.49 and auto deselected 295024 Generic 2.1.31.
2. 295031 void on 1R but double selected on 2R. (EK 2.15 and EK 3.05)
Randomly selected EK 2.15
Inserted 295031 EK 2.15 and auto deselected 295010 AK2.02 .
3. Program selected a total of 14 questions when only 13 are necessary.
295007 and 295014 were the remaining doubles on 1R.
Randomly deselected 295007 AK3.03 from RO outline only.

Tier 1 Group 2

4. 295028 void on 1R but selected on 2R. (EK3.01)
Inserted 295028 EK3.01 and auto deselected 295022 AK3.01
5. 295001 void on 1R but selected double on 2R. (AK1.03 and AK2.05)
Randomly selected AK1.03
Inserted 295001 AK1.03 and randomly deselected 295030 EK1.03.
6. 295038 void on 1R but selected double on 2R. (EK1.03 and Generic 2.4.48)
Randomly selected Generic 2.4.48
Inserted 295038 Generic 2.4.48 and randomly deselected 295017 AA2.04
7. 295008 void on 1R but selected on 2R. (Generic 2.4.50)
Only remaining double in 1R selection field is 295004
Randomly deselected 295004 AK1.02 and inserted 295008 2.4.50
8. 295016 and 295020 void on 1R and not selected on 2R.
Evolutions remain void on submitted outline. This Tier and Group would normally have two voids.

Tier 1 Group 3

9. 295032 on 1R but selected on 2R. (EK2.04)
Inserted 295032 EK2.04 and auto deselected 295035 EK2.03.

Tier 2 Group 1

10. No Generic questions selected on 1R for this Tier and Group. Generic questions selected on 2R for Systems 202002 and 241000, both of which had double K/As selected on 1R.
Inserted 202002 Generic 2.1.27.
Randomly deselected 202002 K3.01.

Inserted 241000 Generic 2.1.10.
Randomly deselected 241000 K3.01.
11. 201001 void on both 1R and 2R
System remains void on submitted outline.
12. 223002 void on 1R but selected double on 2R. (K3.28 and A2.06)
Randomly selected A2.06
Randomly deselected 215004 A3.01.
13. 259002 void on 1R but selected double on 2R. (K5.03 and A3.05)
Randomly selected K5.03
Randomly deselected 239002 K5.01.
14. 264000 void on 1R but selected double on 2R. (A1.01 and A4.04)
Randomly selected A4.04
Auto deselected 206000 A4.06

Tier 2 Group 2

15. System 204000 Topic A1 was selected twice.

See next problem. System 204000 became the selection field for insertion of a generic K/A.

16. No Generic questions selected on 1R for this Tier and Group. Generic questions selected on 2R for Systems 272000 which was void on 1R and 286000 which had double K/As selected on 1R.

Inserted 272000 Generic 2.4.3.

Randomly deselected 264000 A1.09

Inserted 286000 Generic 2.1.30

Randomly deselected 286000 K6.02.

17. 201006, 202001, 215002, 256000, and 262001 were void on both 1R and 2R.

Systems remain void on submitted outline. This Tier and Group would normally have four voids.

18. 205000 void on 1R but selected on 2R. (K2.01)

Inserted 205000 K2.01 and auto deselected 239000 K2.01

19. 230000 void on 1R but selected double on 2R. (A1.01 and A4.13)

Randomly selected A1.01.

Randomly deselected 226001

20. 263000 void on 1R but selected double on 2R. (K3.01 and A2.01)

Randomly selected K3.01.

Randomly deselected 201003 A4.02

21. 290001 void on 1R but selected double on 2R. (K3.01 and A2.01)

Randomly selected A2.01.

Auto deselected 300000 A2.01

22. 400000 void on 1R but selected double on 2R. (K1.03 and K4.01)

Randomly selected K1.03.

Auto deselected 286000 K1.09

Tier 2 Group 3

23. No Generic questions selected but none were selected on 2R.

24. System 268000 was void on both 1R and 2R. System remains void on submitted outline. This Tier and Group would normally have two voids. System 234000 or 288000 will also be void depending on the resolution to the next item.

25. Systems 234000 and 288000 were void on 1R but selected on 2R. Only one system, 290002 was double on 1R.

Randomly selected 234000 A3.02

Randomly deselected 292002 K6.13.

RO

Tier 3

26. Three generic K/As were selected on 1R that were subsequently suppressed because they were system oriented generic K/As. (See general discussion and ES401 D.2.a) Therefore 2.1.27, 2.1.28, and 2.4.49 were deselected.
27. With 2.1.27 and 2.1.28 deselected, auto selected the only two available K/As from 2R; 2.18 & 2.19.
28. With 2.4.49 deselected, randomly selected a 2.4 category K/A from the 2R; 2.4.46.

SRO

Tier 1 Group 1

29. 295015 void on 1R but selected on submitted RO outline. (Generic 2.4.49)
Inserted 295015 Generic 2.4.49 and auto deselected 295024 Generic 2.1.31 on RO outline. (# 1)
Did same on SRO outline.
30. 295016 void on 1R but selected double on 2R SRO (AA1.02 and Gen. 2.4.21)
295007 AK3.03 already deselected per # 3
Randomly selected 295016 Gen. 2.4.21
31. 295038 void on 1R but selected double on 2R SRO (EK2.01 and Gen. 2.4.16)
295010 AK2.02 already deselected per # 2
Randomly selected 295038 EK2.01

Tier 1 Group 2

32. 295008 void on 1R but selected on 2R RO. (Generic 2.4.50)
Replaced 295004 AK1.02 with 295008 Generic 2.4.50 same as on RO outline (# 7)
33. 295028 void on 1R but selected on 2R RO. (EK3.01)
Replaced 295022 AK3.01 with 295028 EK3.01 same as on RO outline (# 4)
34. 295020, 295032, and 295034 were all void on 1R but had K/As selected on 2R SRO. Only two Evolutions with double K/As remain with 1 RO K/A and 3 SRO K/As. Randomly selected 295032 and 295034.
35. 295034 void on 1R but selected on 2R SRO and by #31.
Inserted 295034 Generic 2.4.5.
Auto deselected 295019 Generic 2.1.7
36. 295032 void on 1R but selected on 2R SRO and by #31.
Inserted 295032 EK2.01
Auto deselected 295021 AA1.02 (because it was the only other RO K/A).
37. 600000 was void on 1R and not selected on 2R SRO. This Tier and Group would normally have two voids. 295020 is also void after the selection done in # 31.

SRO

Tier 2 Group1

38. 211000 void on 1R SRO but selected on 1R RO
 Inserted 211000 K4.08 (from submitted RO outline)
 Randomly deselected 212000 K4.05
39. 223002 void on 1R but selected per #12.
 Replaced 215004 A3.01 with 223002 A2.06 same as on RO outline (#12)
40. 259002 void on 1R but selected on submitted RO Outline. (K5.03)
 Inserted 295002 K5.03.
 Auto deselected 226001 K5.06.
41. 262001 void on 1R and on submitted RO outline but selected on 2R SRO. (K4.02)
 Inserted 262001 K4.02.
 Auto deselected 203000 K4.06
42. 264000 void on 1R but selected on submitted RO. (A4.04)
 Inserted 264000 A4.04.
 Randomly deselected 218000 .
43. 290001Void on 1R but selected on submitted RO outline. (A2.01)
 Inserted 290001 A2.01.
 Auto deselected 241000 A2.01

Tier 2 Group2

44. 13 systems were void on 1R when only 9 would be expected. Therefore only 4 sets of voids/doubles could be rectified. The selection field of voids was first reduced to the systems that had available K/As on the submitted RO outline. Systems 214000, 219000, 262002, and 272000 were randomly selected from this list.
45. 214000 void but selected on submitted RO outline.
 Inserted 214000 K3.01.
 Auto deselected 215003 K3.01
46. 219000 void but selected on submitted RO outline.
 Inserted 219000 A1.01.
 Auto deselected 204000 A1.05
47. 262002 void but selected on submitted RO outline.
 Inserted 262002 K3.13
 Randomly deselected 286000 K6.02.
48. 272000 void but selected on submitted RO outline.
 Inserted 272000 2.4.3
 Randomly deselected 271000 K4.07

Tier2 Group 3

49. Only one system had double K/As selected and 4 systems were void. The selection field of voids was first reduced to the systems that had available K/As on the submitted RO outline, which were 215001 and 290002. 290002 was randomly selected.
50. 290002 was void on 1R but selected on submitted RO outline.
 Inserted 290002 K4.03.
 Randomly deselected 239001 K6.01.

Tier 3

51. Four generic K/As were selected on 1R that were subsequently suppressed because they were system oriented generic K/As. (See general discussion and ES401 D.2.a) Therefore 2.1.27, 2.1.28, 2.4.49 and SRO 2.1.12 were deselected.
52. 2.1.27, 2.1.28, and 2.4.49 were replaced per #26-28.
53. With SRO 2.1.12.deselected, randomly selected a 2.1 category K/A from 2R SRO; 2.1.5
54. Only 7 SRO questions were selected for this tier on 1R while when 10 are required. 3 of the 10 common RO K/As were randomly deselected ; 2.1.18, 2.3.4, and 2.4.45. The selection field for replacement SRO K/As was first reduced to those unique to the 2R SRO outline. Randomly selected three replacements; 2.1.17, 2.4.1, 2.4.30.

Facility: DAEC

Form ES-401-1

Exam Date: 04/09/2001

Exam Level: SRO

Tier	Group	K/A Category Points											Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	
1. Emergency & Abnormal Plant Evolutions	1	4	5	3				4	5			5	26
	2	2	3	3				2	3			4	17
	Tier Totals	6	8	6				6	8			9	43
2. Plant Systems	1	1	2	2	2	2	2	2	3	2	2	3	23
	2	1	1	2	0	2	0	1	1	1	1	3	13
	3	0	1	0	1	0	0	0	0	1	0	1	4
	Tier Totals	2	4	4	3	4	2	3	4	4	3	7	40
3. Generic Knowledge And Abilities					Cat 1		Cat 2		Cat 3		Cat 4		
					5		4		3		5		17

Note:

1. Attempt to distribute topics among all K/A Categories; select at least one topic from every K/A category within each tier.
2. Actual point totals must match those specified in the table.
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.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category tier.

BWR SRO Examination Outline

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ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-1

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
295003	Partial or Complete Loss of A.C. Power / 6		X					AK2.02 - Emergency generators	4.2*	1
295006	SCRAM / 1						X	2.1.14 - Knowledge of system status criteria which require the notification of plant personnel.	3.3	1
295006	SCRAM / 1		X					AK2.02 - Reactor water level control system	3.8	1
295007	High Reactor Pressure / 3				X			AA1.05 - Reactor/turbine pressure regulating system	3.8	1
295009	Low Reactor Water Level / 2			X				AK3.01 - Recirculation pump run back: Plant-Specific	3.3	1
295010	High Drywell Pressure / 5	X						AK1.01 - Downcomer submergence: Mark-I&II	3.4	1
295013	High Suppression Pool Temperature / 5		X					AK2.01 - Suppression pool cooling	3.7	1
295014	Inadvertent Reactivity Addition / 1			X				AK3.01 - Reactor SCRAM	4.1	1
295014	Inadvertent Reactivity Addition / 1				X			AA1.03 - RMCS: Plant-Specific	3.5	1
295015	Incomplete SCRAM / 1						X	2.4.49 - Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	1
295016	Control Room Abandonment / 7						X	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.	4.3	1

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Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-1

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
295017	High Off-Site Release Rate / 9				X			AA1.11 - PCIS/NSSSS	4.1	1
295023	Refueling Accidents / 8					X		AA2.01 - Area radiation levels	4.0	1
295024	High Drywell Pressure / 5			X				EK3.04 - †Emergency depressurization	4.1	1
295025	High Reactor Pressure / 3						X	2.4.22 - Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.	4.0	1
295025	High Reactor Pressure / 3					X		EA2.05 - Decay heat generation	3.6	1
295026	Suppression Pool High Water Temperature / 5					X		EA2.02 - Suppression pool level	3.9	1
295026	Suppression Pool High Water Temperature / 5	X						EK1.01 - Pump NPSH	3.4	1
295030	Low Suppression Pool Water Level / 5	X						EK1.03 - Heat capacity	4.1*	1
295030	Low Suppression Pool Water Level / 5		X					EK2.07 - Downcomer/ horizontal vent submergence	3.8	1
295031	Reactor Low Water Level / 2					X		EA2.01 - Reactor water level	4.6*	1
295031	Reactor Low Water Level / 2						X	2.4.8 - Knowledge of how the event-based emergency/abnormal operating procedures are used in conjunction with the symptom-based EOPs.	3.7	1
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1					X		EA2.03 - SBLC tank level	4.4*	1
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1	X						EK1.02 - Reactor water level effects on reactor power	4.3*	1

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Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-1

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
295038	High Off-Site Release Rate / 9		X					EK2.01 - Radwaste	3.4	1
500000	High Containment Hydrogen Concentration / 5				X			EA1.07 - Nitrogen purge system	3.3	1

K/A Category Totals: 4 5 3 4 5 5

Group Point Total: 26

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ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-1

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
295001	Partial or Complete Loss of Forced Core Flow Circulation / 1					X		AA2.03 - Actual core flow	3.3	1
295002	Loss of Main Condenser Vacuum / 3	X						AK1.03 - Loss of heat sink	3.8	1
295004	Partial or Complete Loss of D.C. Power / 6				X			AA1.03 - A.C. electrical distribution	3.6	1
295005	Main Turbine Generator Trip / 3				X			AA1.07 - A.C. electrical distribution	3.3	1
295008	High Reactor Water Level / 2						X	2.4.50 - Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	3.3	1
295012	High Drywell Temperature / 5		X					AK2.01 - Drywell ventilation	3.5	1
295018	Partial or Complete Loss of Component Cooling Water / 8			X				AK3.01 - Isolation of non-essential heat loads: Plant-Specific	3.2	1
295019	Partial or Complete Loss of Instrument Air / 8					X		AA2.02 - Status of safety-related instrument air system loads (see AK2.1-AK2.19)	3.7	1
295021	Loss of Shutdown Cooling / 4					X		AA2.07 - Reactor recirculation flow	3.1	1
295022	Loss of CRD Pumps / 1	X						AK1.02 - Reactivity control	3.7	1
295028	High Drywell Temperature / 5			X				EK3.01 - Emergency depressurization	3.9	1

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Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-1

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
295029	High Suppression Pool Water Level / 5						X	2.1.7 - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	1
295032	High Secondary Containment Area Temperature / 5		X					EK2.01 - Area/room coolers	3.6	1
295033	High Secondary Containment Area Radiation Levels / 9			X				EK3.03 - Isolating affected systems	3.9	1
295034	Secondary Containment Ventilation High Radiation / 9						X	2.4.5 - Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.	3.6	1
295035	Secondary Containment High Differential Pressure / 5		X					EK2.03 - †Off-site release rate	4.1	1
295036	Secondary Containment High Sump/Area Water Level / 5						X	2.4.4 - Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.3	1

K/A Category Totals: 2 3 3 2 3 4

Group Point Total: 17

BWR SRO Examination Outline

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ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-1

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
202002	Recirculation Flow Control System / 1			X									K3.01 - Core flow	3.5	1
202002	Recirculation Flow Control System / 1							X					A1.01 - Recirculation pump speed: BWR-2, 3, 4, 5, 6	3.2	1
203000	RHR/LPCI: Injection Mode (Plant Specific) / 2											X	2.4.47 - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	3.7	1
206000	High Pressure Coolant Injection System / 2										X		A4.06 - Reactor pressure: BWR-2, 3, 4	4.3*	1
209001	Low Pressure Core Spray System / 2		X										K2.02 - Valve power	2.7*	1
211000	Standby Liquid Control System / 1				X								K4.08 - System initiation upon operation of SBLC control switch	4.2*	1
212000	Reactor Protection System / 7											X	2.4.8 - Knowledge of how the event-based emergency/abnormal operating procedures are used in conjunction with the symptom-based EOPs.	3.7	1
215004	Source Range Monitor (SRM) System / 7											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.	3.8	1

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Plant Systems - Tier 2 / Group 1

Form ES-401-1

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
215005	Average Power Range Monitor/Local Power Range Monitor System / 7			X									K3.08 - †core thermal calculations	3.4	1
215005	Average Power Range Monitor/Local Power Range Monitor System / 7						X						K6.04 - Trip units	3.2	1
216000	Nuclear Boiler Instrumentation / 7							X					A1.03 - Surveillance testing	3.2*	1
217000	Reactor Core Isolation Cooling System (RCIC) / 2								X				A2.02 - Turbine trips	3.7	1
218000	Automatic Depressurization System / 3									X			A3.07 - Lights and alarms	3.6	1
223001	Primary Containment System and Auxiliaries / 5		X										K2.09 - Drywell cooling fans: Plant-Specific	2.9*	1
223002	Primary Containment Isolation System/Nuclear Steam Supply Shut-Off / 5								X				A2.06 - Containment instrumentation failures	3.2	1
226001	RHR/LPCI: Containment Spray System Mode / 5						X						K6.12 - Containment integrity	3.5	1
239002	Relief/Safety Valves / 3					X							K5.01 - Relief function of SRV operation	3.5	1
241000	Reactor/Turbine Pressure Regulating System / 3	X											K1.11 - RPS	3.8	1
259002	Reactor Water Level Control System / 2					X							K5.03 - Water level measurement	3.2	1

BWR SRO Examination Outline

Printed: 01/19/2001

Facility: DAEC

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-1

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
261000	Standby Gas Treatment System / 9									X			A3.02 - Fan start	3.1	1
262001	A.C. Electrical Distribution / 6				X								K4.02 - Circuit breaker automatic trips	3.3	1
264000	Emergency Generators (Diesel/Jet) / 6										X		A4.04 - Manual start, loading, and stopping of emergency generator: Plant-Specific	3.7	1
290001	Secondary Containment / 5								X				A2.01 - †Personnel airlock failure	3.7	1

K/A Category Totals: 1 2 2 2 2 2 2 3 2 2 3

Group Point Total: 23

BWR SRO Examination Outline

Printed: 01/19/2001

Facility: DAEC

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-1

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
204000	Reactor Water Cleanup System / 2											X	2.4.35 - Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications.	3.5	1
205000	Shutdown Cooling System (RHR Shutdown Cooling Mode) / 4											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.	3.8	1
214000	Rod Position Information System / 7			X									K3.01 - RWM: Plant-Specific	3.2	1
215003	Intermediate Range Monitor (IRM) System / 7					X							K5.03 - Changing detector position	3.1	1
230000	RHR/LPCI: Torus/Suppression Pool Spray Mode / 5							X					A1.01 - Suppression chamber pressure	3.9	1
245000	Main Turbine Generator and Auxiliary Systems / 4										X		A4.05 - Generator megawatt output	2.7	1
259001	Reactor Feedwater System / 2		X										K2.01 - Reactor feedwater pump(s): Motor-Driven-Only	3.3	1
262002	Uninterruptable Power Supply (A.C./D.C.) / 6			X									K3.13 - Rx pressure: Plant-Specific	2.9	1
271000	Offgas System / 9					X							K5.11 - Explain the necessity of reducing relative humidity for carbon bed filters	2.8	1

BWR SRO Examination Outline

Printed: 01/19/2001

Facility: DAEC

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-1

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
272000	Radiation Monitoring System / 7											X	2.4.3 - Ability to identify post-accident instrumentation.	3.8	1
286000	Fire Protection System / 8	X											K1.09 - Emergency generator rooms: Plant-Specific	3.3	1
290003	Control Room HVAC / 9								X				A2.01 - Initiation/reconfiguration	3.2	1
300000	Instrument Air System (IAS) / 8									X			A3.02 - Air temperature	2.7	1

K/A Category Totals: 1 1 2 0 2 0 1 1 1 1 3

Group Point Total: 13

BWR SRO Examination Outline

Printed: 01/19/2001

Facility: DAEC

ES - 401

Plant Systems - Tier 2 / Group 3

Form ES-401-1

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
201003	Control Rod and Drive Mechanism / 1											X	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.	4.3	1
233000	Fuel Pool Cooling and Clean-up / 9									X			A3.03 - System indicating lights and alarms	2.6	1
239001	Main and Reheat Steam System / 3		X										K2.01 - Main steam isolation valve solenoids	3.3*	1
290002	Reactor Vessel Internals / 5				X								K4.03 - Core orificing	3.3	1

K/A Category Totals: 0 1 0 1 0 0 0 0 1 0 1

Group Point Total: 4

Generic Knowledge and Abilities Outline (Tier 3)

Printed: 01/19/2001

BWR SRO Examination Outline

Form ES-401-5

Facility: DAEC

Generic Category	KA	KA Topic	Imp.	Points
Conduct of Operations	2.1.4	Knowledge of shift staffing requirements.	3.4	1
	2.1.5	Ability to locate and use procedures and directives related to shift staffing and activities.	3.4	1
	2.1.8	Ability to coordinate personnel activities outside the control room.	3.6	1
	2.1.9	Ability to direct personnel activities inside the control room.	4.0	1
	2.1.17	Ability to make accurate, clear and concise verbal reports.	3.6	1
Category Total:				5
Equipment Control	2.2.34	Knowledge of the process for determining the internal and external effects on core reactivity.	3.2*	1
	2.2.6	Knowledge of the process for making changes in procedures as described in the safety analysis report.	3.3	1
	2.2.23	Ability to track limiting conditions for operations.	3.8	1
	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1
Category Total:				4
Radiation Control	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	3.3	1
	2.3.1	Knowledge of 10 CFR 20 and related facility radiation control requirements.	3.0	1
	2.3.2	Knowledge of facility ALARA program.	2.9	1
Category Total:				3

Generic Knowledge and Abilities Outline (Tier 3)

Printed: 01/19/2001

BWR SRO Examination Outline

Form ES-401-5

Facility: DAEC

Generic Category	KA	KA Topic	Imp.	Points
Emergency Plan	2.4.11	Knowledge of abnormal condition procedures.	3.6	1
	2.4.19	Knowledge of EOP layout, symbols, and icons.	3.7	1
	2.4.1	Knowledge of EOP entry conditions and immediate action steps.	4.6	1
	2.4.30	Knowledge of which events related to system operations/status should be reported to outside agencies.	3.6	1
	2.4.46	Ability to verify that the alarms are consistent with the plant conditions.	3.6	1

Category Total: 5

Generic Total: 17

Facility: DAEC

Form ES-401-2

Exam Date: 04/09/2001

Exam Level: RO

Tier	Group	K/A Category Points											Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	
1. Emergency & Abnormal Plant Evolutions	1	2	2	3				4	1			1	13
	2	4	4	3				3	2			3	19
	3	0	1	1				1	1			0	4
	Totals Tier	6	7	7				8	4			4	36
2. Plant Systems	1	3	3	2	3	2	3	3	2	2	3	2	28
	2	1	2	3	2	2	1	2	2	1	1	2	19
	3	0	0	0	1	0	0	1	0	2	0	0	4
	Tier Totals	4	5	5	6	4	4	6	4	5	4	4	51
3. Generic Knowledge And Abilities					Cat 1		Cat 2		Cat 3		Cat 4		
					4		3		3		3		13

Note:

1. Attempt to distribute topics among all K/A Categories; select at least one topic from every K/A category within each tier.
2. Actual point totals must match those specified in the table.
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.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category tier.

BWR RO Examination Outline

Printed: 01/19/2001

Facility: DAEC

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
295005	Main Turbine Generator Trip / 3				X			AA1.07 - A.C. electrical distribution	3.3	1
295006	SCRAM / 1		X					AK2.02 - Reactor water level control system	3.8	1
295007	High Reactor Pressure / 3				X			AA1.05 - Reactor/turbine pressure regulating system	3.7	1
295009	Low Reactor Water Level / 2			X				AK3.01 - Recirculation pump run back: Plant-Specific	3.2	1
295010	High Drywell Pressure / 5	X						AK1.01 - Downcomer submergence: Mark-I&II	3.0	1
295014	Inadvertent Reactivity Addition / 1			X				AK3.01 - Reactor SCRAM	4.1*	1
295014	Inadvertent Reactivity Addition / 1				X			AA1.03 - RMCS: Plant-Specific	3.5	1
295015	Incomplete SCRAM / 1						X	2.4.49 - Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	1
295024	High Drywell Pressure / 5			X				EK3.04 - †Emergency depressurization	3.7	1
295025	High Reactor Pressure / 3					X		EA2.05 - Decay heat generation	3.4	1
295031	Reactor Low Water Level / 2		X					EK2.15 - A.C. distribution: Plant-Specific	3.2	1
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1	X						EK1.02 - Reactor water level effects on reactor power	4.1*	1
500000	High Containment Hydrogen Concentration / 5				X			EA1.07 - Nitrogen purge system	3.4	1

K/A Category Totals: 2 2 3 4 1 1

Group Point Total: 13

BWR RO Examination Outline

Printed: 01/19/2001

Facility: DAEC

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-2

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
295001	Partial or Complete Loss of Forced Core Flow Circulation / 1	X						AK1.03 - †Thermal limits	3.6	1
295002	Loss of Main Condenser Vacuum / 3	X						AK1.03 - Loss of heat sink	3.6	1
295003	Partial or Complete Loss of A.C. Power / 6		X					AK2.02 - Emergency generators	4.1*	1
295004	Partial or Complete Loss of D.C. Power / 6				X			AA1.03 - A.C. electrical distribution	3.4	1
295008	High Reactor Water Level / 2						X	2.4.50 - Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	3.3	1
295012	High Drywell Temperature / 5		X					AK2.01 - Drywell ventilation	3.4	1
295013	High Suppression Pool Temperature / 5		X					AK2.01 - Suppression pool cooling	3.6	1
295017	High Off-Site Release Rate / 9				X			AA1.11 - PCIS/NSSSS	3.9	1
295018	Partial or Complete Loss of Component Cooling Water / 8			X				AK3.01 - Isolation of non-essential heat loads: Plant-Specific	2.9	1
295019	Partial or Complete Loss of Instrument Air / 8				X			AA1.04 - Service air isolations valves: Plant-Specific	3.3	1
295022	Loss of CRD Pumps / 1	X						AK1.02 - Reactivity control	3.6	1
295026	Suppression Pool High Water Temperature / 5	X						EK1.01 - Pump NPSH	3.0	1
295028	High Drywell Temperature / 5			X				EK3.01 - Emergency depressurization	3.6	1

BWR RO Examination Outline

Printed: 01/19/2001

Facility: DAEC

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-2

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
295029	High Suppression Pool Water Level / 5						X	2.4.2 - Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.	3.9	1
295030	Low Suppression Pool Water Level / 5		X					EK2.07 - Downcomer/ horizontal vent submergence	3.5	1
295033	High Secondary Containment Area Radiation Levels / 9			X				EK3.03 - Isolating affected systems	3.8	1
295034	Secondary Containment Ventilation High Radiation / 9					X		EA2.01 - Ventilation radiation levels	3.8	1
295038	High Off-Site Release Rate / 9						X	2.4.48 - Ability to interpret control room indications to verify the status and operation of system, and understand how operator action s and directives affect plant and system conditions.	3.5	1
600000	Plant Fire On Site / 8					X		AA2.13 - Need for emergency plant shutdown	3.2	1

K/A Category Totals: 4 4 3 3 2 3

Group Point Total: 19

BWR RO Examination Outline

Printed: 01/19/2001

Facility: DAEC

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 3

Form ES-401-2

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
295021	Loss of Shutdown Cooling / 4				X			AA1.02 - RHR/shutdown cooling	3.5	1
295023	Refueling Accidents / 8					X		AA2.01 - Area radiation levels	3.6	1
295032	High Secondary Containment Area Temperature / 5		X					EK2.04 - PCIS/NSSSS	3.6	1
295035	Secondary Containment High Differential Pressure / 5			X				EK3.01 - Blow-out panel operation: Plant-Specific	2.8	1

K/A Category Totals: 0 1 1 1 1 0

Group Point Total: 4

BWR RO Examination Outline

Printed: 01/19/2001

Facility: DAEC

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
201002	Reactor Manual Control System / 1										X		A4.03 - Rod drift test switch	2.8	1
202002	Recirculation Flow Control System / 1							X					A1.01 - Recirculation pump speed: BWR-2, 3, 4, 5, 6	3.2	1
202002	Recirculation Flow Control System / 1											X	2.1.27 - Knowledge of system purpose and/or function.	2.8	1
203000	RHR/LPCI: Injection Mode (Plant Specific) / 2				X								K4.06 - Adequate pump net positive suction head (interlock suction valve open): Plant-Specific	3.5	1
206000	High Pressure Coolant Injection System / 2	X											K1.16 - Containment/Torus pressure: BWR-2, 3, 4	3.5	1
209001	Low Pressure Core Spray System / 2		X										K2.02 - Valve power	2.5*	1
209001	Low Pressure Core Spray System / 2							X					A1.02 - Core spray pressure	3.2	1
211000	Standby Liquid Control System / 1				X								K4.08 - System initiation upon operation of SBLC control switch	4.2*	1
212000	Reactor Protection System / 7				X								K4.05 - Functional testing of the system while maintaining power operation	3.4	1
212000	Reactor Protection System / 7						X						K6.02 - Nuclear instrumentation	3.7	1

215003 Intermediate Range Monitor (IRM) System / 7

X

K3.01 - RPS

3.9

1

BWR RO Examination Outline

Printed: 01/19/2001

Facility: DAEC

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
215003	Intermediate Range Monitor (IRM) System / 7					X							K5.03 - Changing detector position	3.0	1
215004	Source Range Monitor (SRM) System / 7						X						K6.01 - RPS	3.2	1
215005	Average Power Range Monitor/Local Power Range Monitor System / 7			X									K3.08 - †core thermal calculations	3.0	1
215005	Average Power Range Monitor/Local Power Range Monitor System / 7						X						K6.04 - Trip units	3.1	1
216000	Nuclear Boiler Instrumentation / 7							X					A1.03 - Surveillance testing	2.9*	1
217000	Reactor Core Isolation Cooling System (RCIC) / 2								X				A2.02 - Turbine trips	3.8	1
218000	Automatic Depressurization System / 3	X											K1.04 - Drywell/containment pressure: Plant-Specific	3.9	1
218000	Automatic Depressurization System / 3									X			A3.07 - Lights and alarms	3.7	1
223001	Primary Containment System and Auxiliaries / 5		X										K2.09 - Drywell cooling fans: Plant-Specific	2.7	1
223002	Primary Containment Isolation System/Nuclear Steam Supply Shut-Off / 5								X				A2.06 - Containment instrumentation failures	3.0	1

BWR RO Examination Outline

Printed: 01/19/2001

Facility: DAEC

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
239002	Relief/Safety Valves / 3										X		A4.06 - Reactor water level	3.9	1
241000	Reactor/Turbine Pressure Regulating System / 3	X											K1.11 - RPS	3.7	1
241000	Reactor/Turbine Pressure Regulating System / 3											X	2.1.10 - Knowledge of conditions and limitations in the facility license.	2.7	1
259001	Reactor Feedwater System / 2		X										K2.01 - Reactor feedwater pump(s): Motor-Driven-Only	3.3	1
259002	Reactor Water Level Control System / 2					X							K5.03 - Water level measurement	3.1	1
261000	Standby Gas Treatment System / 9									X			A3.02 - Fan start	3.2	1
264000	Emergency Generators (Diesel/Jet) / 6										X		A4.04 - Manual start, loading, and stopping of emergency generator: Plant-Specific	3.7	1

K/A Category Totals: 3 3 2 3 2 3 3 2 2 3 2

Group Point Total: 28

BWR RO Examination Outline

Printed: 01/19/2001

Facility: DAEC

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-2

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
201003	Control Rod and Drive Mechanism / 1				X								K4.07 - Maintaining the control rod at a given location	3.2	1
204000	Reactor Water Cleanup System / 2							X					A1.05 - System pressure	2.6	1
205000	Shutdown Cooling System (RHR Shutdown Cooling Mode) / 4		X										K2.01 - Pump motors	3.1*	1
214000	Rod Position Information System / 7			X									K3.01 - RWM: Plant-Specific	3.0	1
219000	RHR/LPCI: Torus/Suppression Pool Cooling Mode / 5		X										K2.01 - †Valves	2.5*	1
226001	RHR/LPCI: Containment Spray System Mode / 5					X							K5.06 - Vacuum breaker operation	2.6	1
230000	RHR/LPCI: Torus/Suppression Pool Spray Mode / 5							X					A1.01 - Suppression chamber pressure	3.8	1
239001	Main and Reheat Steam System / 3						X						K6.01 - Electrical power	3.1	1
245000	Main Turbine Generator and Auxiliary Systems / 4										X		A4.05 - Generator megawatt output	2.7	1
262002	Uninterruptable Power Supply (A.C./D.C.) / 6			X									K3.13 - Rx pressure: Plant-Specific	2.7	1
263000	D.C. Electrical Distribution / 6			X									K3.01 - Emergency generators: Plant-Specific	3.4	1

BWR RO Examination Outline

Printed: 01/19/2001

Facility: DAEC

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-2

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
271000	Offgas System / 9				X								K4.07 - Maximizing charcoal bed efficiency	2.6	1
271000	Offgas System / 9					X							K5.11 - Explain the necessity of reducing relative humidity for carbon bed filters	2.6	1
272000	Radiation Monitoring System / 7											X	2.4.3 - Ability to identify post-accident instrumentation.	3.5	1
286000	Fire Protection System / 8											X	2.1.30 - Ability to locate and operate components, including local controls.	3.9	1
290001	Secondary Containment / 5								X				A2.01 - †Personnel airlock failure	3.3	1
290003	Control Room HVAC / 9								X				A2.01 - Initiation/reconfiguration	3.1	1
300000	Instrument Air System (IAS) / 8									X			A3.02 - Air temperature	2.9	1
400000	RWS, ESW, RHRSW, RBCCW, and WW / 8	X											K1.03 - Radiation monitoring systems	2.7	1

K/A Category Totals: 1 2 3 2 2 1 2 2 1 1 2

Group Point Total: 19

BWR RO Examination Outline

Printed: 01/19/2001

Facility: DAEC

ES - 401

Plant Systems - Tier 2 / Group 3

Form ES-401-2

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
215001	Traversing In-Core Probe / 7							X					A1.02 - Detector position: (Not-BWR1)	2.5	1
233000	Fuel Pool Cooling and Clean-up / 9									X			A3.03 - System indicating lights and alarms	2.6	1
234000	Fuel Handling Equipment / 8									X			A3.02 - †Interlock operation	3.1	1
290002	Reactor Vessel Internals / 5				X								K4.03 - Core orificing	3.2	1

K/A Category Totals: 0 0 0 1 0 0 1 0 2 0 0

Group Point Total: 4

Generic Knowledge and Abilities Outline (Tier 3)

Printed: 01/19/2001

BWR RO Examination Outline

Form ES-401-5

Facility: DAEC

Generic Category	KA	KA Topic	Imp.	Points
Conduct of Operations	2.1.18	Ability to make accurate, clear and concise logs, records, status boards, and reports.	2.9	1
	2.1.20	Ability to execute procedure steps.	4.3	1
	2.1.8	Ability to coordinate personnel activities outside the control room.	3.8	1
	2.1.9	Ability to direct personnel activities inside the control room.	2.5	1
Category Total:				4
Equipment Control	2.2.23	Ability to track limiting conditions for operations.	2.6	1
	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	2.5	1
	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	4.0	1
Category Total:				3
Radiation Control	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1
	2.3.2	Knowledge of facility ALARA program.	2.5	1
	2.3.9	Knowledge of the process for performing a containment purge.	2.5	1
Category Total:				3
Emergency Plan	2.4.45	Ability to prioritize and interpret the significance of each annunciator or alarm.	3.3	1
	2.4.19	Knowledge of EOP layout, symbols, and icons.	2.7	1
	2.4.46	Ability to verify that the alarms are consistent with the plant conditions.	3.5	1
Category Total:				3
Generic Total:				13

Facility: <u>DAEC</u>		Date of Examination: <u>04/13/2001</u>
Examination level (circle one): RO / <u>SRO</u>		Operating Test Number: _____
Administrative Topic/Subject Description		Describe Method of Evaluation 1. ONE Administrative JPM OR 2. TWO Administrative Questions
A.1. a	Determine RBM Operability Requirement	The Senior Operator candidate will use Technical Specifications to determine if a Rod Block Monitor channel is required to be operable.
A.1. b	Return an MOV to operable status	The Senior Operator candidate will review a Core Spray System Panel Lineup and determine actions necessary to restore an MOV to an Operable status.
A.2	Perform OP-24 for the RSP Area	The Senior Operator candidate will perform an inventory of emergency procedures and equipment maintained in the Remote Shutdown Panel Area
A.3	Gain Access to a High Rad Area	JPM/Questions The JPM will be administered when the operator enters the RCA. It will test the operators knowledge of the requirements for entry into a High Radiation Area.
A.4	Perform OP-28 EPIP Offsite Agencies Notification Weekly Test	The Senior Operator candidate will perform a weekly test of the communications necessary to notify off-site agencies of an emergency.

Facility: <u>DAEC</u>		Date of Examination: <u>04/13/2001</u>
Examination level (circle one): <u>RO</u> / SRO		Operating Test Number: _____
Administrative Topic/Subject Description		Describe Method of Evaluation 1. ONE Administrative JPM OR 2. TWO Administrative Questions
A.1. a	Determine LCRP from computer	The operator will obtain an Official 3D Case and determine if a Limiting Control Rod Pattern exists
A.1. b	Perform Control Room Shiftly Checklist	The operator will perform a Control Room panel check and determine that five (5) switches are out of position and answer questions associated with each switch and how the error would affect the associated system.
A.2	Perform an STP	The operator will perform the Main Steam Line Radiation Monitor Channel Functional Test.
A.3	Gain Access to a High Rad Area	JPM/Questions The JPM will be administered when the operator enters the RCA. It will test the operators knowledge of the requirements for entry into a High Radiation Area.
A.4	Perform the duties of the Back Panel Communicator	This JPM will test the operators ability to apply the requirements of the Emergency Plan Implementation Procedures.

ES-301

Control room systems and facility walk through test outline form ES-301

Facility: <u>DAEC</u>		Date of Examination: <u>04/13/2001</u>
Exam level (circle one): RO / SRO (I) / <u>SRO (U)</u>		Operating test No: _____
B.1 Control Room Systems		
System /JPM Title	Type Code	Safety Function
a. Rapid Restart of RFP following a reactor scram <u>259001-11</u> Task 45.00	(N), (S), (L)	2 Reactor Water Inventory Control
b. Install EOP Defeat 5 to depressurize the reactor <u>239001-02</u> Task 95.25	(N), (S), (L)	3 Reactor Pressure Control
c. Manual Initiation of SGBT and Secondary Containment <u>261000-07</u> Task 7.04	(D), (S), (A) (ESF)	9 Radioactivity Release
*Type Codes: (D)irect from bank, (M)odified from bank, (N)ew , (A)lternate path, (C)ontrolroom, (S)imulator, (L)ow power, (R)CA		

ES-301

Control room systems and facility walk through test outline form ES-301

B.2 Facility Walk-Through		
System /JPM Title	Type Code	Safety Function
a. Manual control of Recirc MG set from MG set room <u>202002-05</u> Task 12.02	(D), (R)	1 Reactivity control
b. Manually Initiate CARDOX <u>286000-03</u> Task NSPEO 9.08	(D), (R), (A) (AOP)	8 Plant Service Systems
*Type Codes: (D)irect from bank, (M)odified from bank, (N)ew , (A)lternate path, (C)ontrolroom, (S)imulator, (L)ow power, (R)CA		

Facility: <u>DAEC</u>		Date of Examination: <u>4/13/2001</u>
Exam level (circle one): <u>RO</u> / SRO (I) / SRO (U)		Operating test No: _____
B.1 Control Room Systems		
System /JPM Title	Type Code	Safety Function
a. Start a CRD pump under normal conditions <u>201001-06</u> Task 10.01	(N), (S)	1 Reactivity control
b. Rapid Restart of RFP following a reactor scram <u>259001-11</u> Task 45.00	(N), (S), (L)	2 Reactor Water Inventory Control
c. Install EOP Defeat 5 to depressurize the reactor <u>239001-02</u> Task 95.25	(N), (S), (L)	3 Reactor Pressure Control
d. PRA for manual startup of RCIC system to establish a cooldown <u>217000-16</u> Task 3.04	(N), (S), (L)	4 Heat Removal from Core
e. PRA to re-energize a de-energized essential 4160V bus from the Standby Transformer <u>262001-07</u> Task 15.05	(M), (S), (L)	6 Electrical
f. Respond to APRM Upscale and remove a flow unit from service <u>215005-02</u> Task 99.12	(D), (S), (A)	7 Instrumentation
g. Manual Initiation of SBGT and Secondary Containment <u>261000-07</u> Task 7.04	(D), (S), (A) (ESF)	9 Radioactivity Release
*Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrolroom, (S)imulator, (L)ow power, (R)CA		

B.2 Facility Walk-Through

System /JPM Title	Type Code	Safety Function
a. Manual control of Recirc MG set from MG set room <u>202002-05</u> Task 12.02	(D), (R)	1 Reactivity control
b. Fill Torus using Core Spray <u>209001-03</u> Task NSPEO 39.02	(D), (R), (A)	5 Containment Integrity
c. Manually Initiate CARDOX <u>286000-03</u> Task NSPEO 9.08	(D), (R), (A) (AOP)	8 Plant Service Systems
*Type Codes: (D)irect from bank, (M)odified from bank, (N)ew , (A)lternate path, (C)ontrolroom, (S)imulator, (L)ow power, (R)CA		

Scenario Outline

Scenario Number ESG 12 License Exam 4/9/2001

Examiners _____

Operators SRO 1 _____

RO 1 _____

RO 2 _____

Objectives: Evaluate a reactor power decrease with the Reactor Recirculation System; Restoration of HPCI to the Standby Readiness condition; Response to various instrument failures

Initial Conditions: HPCI is in day 9 of 14, it has been repaired but is still isolated. The crew is to repressurize the HPCI system in preparation to perform an operability run.

Turnover: The plant is operating at 90% power.

Event No.	Malf. No.	Event Type	Event Description
1	N/A	R	1C05 Decrease power with Recirc by 60 MWe. (K/A 202002 A4.01)
2	N/A	N	SRO Direct BOP to Restore HPCI to Standby Readiness. BOP Place HPCI in Standby Readiness condition. (K/A 206000 A4.04)
3	N/A	N	SRO Direct the BOP operator to start service water systems BOP Startup RHRSW/ESW for chlorination of Service Water pits. (400000 A4.01)
4	LO RRHS4642A[GREEN] AN:1C03C[29]	I/C	SRO Direct crew response to XFV actuation BOP Respond to XFV-4642A failing in an intermediate position (K/A 223002 A1.01)
5	MS23B	I/C	SRO Direct the BOP operator to verify the Group 3 isolation completed. BOP A group 3B isolation occurs with a failure of CV-4371A (K/A 223002 A1.02)
6	RR17B	I/C	SRO Direct operator response to a trip of one Recirc pump. 1C05 "B" Recirc MG set trips (K/A 202002 A2.01)
7	HP01	I/C	BOP HPCI spurious initiation (K/A 206000 A2.17)
8	MS08E	M	ALL HPCI steam line break in the Steam Tunnel (K/A 295032 EA1.05)
9	AO RHFI1971B	I/C	BOP "B" RHR loop flow indicator fails (K/A 219000 A1.02)
10	HP10B	I/C	BOP HPCI fails to isolate (K/A 223002 A2.01)

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

Scenario Outline

Scenario Number ESG 13 License Exam 4/13/2001

Examiners _____

Operators SRO-1
RO-1
RO-2

Objectives: Evaluate an increase in reactor power using Recirc; Manual operation of SFU; Performing Main Turbine Operational Tests; Operator response to various instrument and component malfunctions and operator response to a LOCA inside the PC.

Initial Conditions: Plant startup is in progress with reactor power is at 50%.

Turnover: Reactor power is at 50%. Perform manual startup of "A" SFU for system engineer. Continue the up power and at 60%, perform STP NS930001, "Main Turbine Operational Tests"

Event No.	Malf. No.	Event Type	Event Description
1	N/A	R	1C05 Increase reactor power with Recirc (K/A 202002 A4.01)
2	N/A	N	BOP Perform manual startup of SFU. (K/A 290003 A4.01)
3	LO TCMTRPRSTG LO TCBUSPTST	C	BOP Perform STP NS930001, Main Turbine Operational Tests". The Overspeed Trip Device and Mechanical Trip Valve Test and Backup Overspeed Trip Circuits Test will be UNSAT which requires that the turbine be unloaded immediately. (K/A 241000 K4.13)
4	RR28A or B	I/C	1C05 GEMAC variable leg break (K/A 216000 A2.03)
5	EG02B TC03D	I/C	1C05 Main Generator backup lockout relay does not trip and an open transfer of the non-essential buses occur when the primary lockout relay trips. (K/A 262001 K4.03)
6	RR30 as necessary	M	Crew Perform actions of EOP 1 and EOP 2 as drywell pressure and temperature rise. (K/A 295024)
7	DI HPHS2256	I/C	BOP HPCI fails to start (K/A 206000 A3.03)
8	RH09A and DI RHHS2001	I/C	BOP Containment Spray valves will not open (K/A 226001 A2.05)
9	RR33	I/C	1C05 and BOP Level oscillations occur when the Saturation Curve is entered. (K/A 216000 A2.08)
10	N/A	M	Crew Perform the actions required by RPV Flooding. (K/A 295028)

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

