

**INITIAL SUBMITTAL OF WRITTEN AND OPERATING OUTLINES,**

**ES-201-2, AND NRC COMMENTS**

**FOR THE DAVIS-BESSE INITIAL EXAMINATION - MARCH 2002**

Guy G. Campbell  
Vice President - Nuclear

419-321-8588  
Fax: 419-321-8337

Docket Number 50-346

License Number NPF-3

Serial Number 1-1253

November 30, 2001

Mr. M. Bielby  
Chief Examiner – Region III  
United States Nuclear Regulatory Commission  
801 Warrenville Road  
Lisle, IL 60532-4351

Subject: Operator License Examination Outline

Dear Mr. Bielby:

Enclosed is the operator license examination outline required to support the operator license examinations being administered at the Davis-Besse Nuclear Power Station (DBNPS) during the week of March 4, 2002. This examination outline is considered confidential material and shall be withheld from public disclosure until after the scheduled operator examinations are complete.

Mr. Donald Bondy, Senior Nuclear Instructor, can respond to questions with regard to the submitted materials, at (419) 321-8275.

If you require additional information, please contact Mr. David H. Lockwood, Manager – Regulatory Affairs, at (419) 321-8450.

Sincerely yours,



AWB/s  
Enclosures

cc: D. E. Hills, Chief - Operations Branch, NRC Region III w/o  
S. P. Sands, DB-1 NRC/NRR Project Manager w/o  
D. S. Simpkins, DB-1 Senior Resident Inspector (Acting) w/o  
USNRC Document Control Desk w/o  
Utility Radiological Safety Board w/o

DEC 04 2001

Docket Number 50-346  
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Attachment  
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### **COMMITMENT LIST**

The following list identifies those actions committed to by the Davis-Besse Nuclear Power Station in this document. Any other actions discussed in the submittal represent intended or planned actions by Davis-Besse. They are described only as information and are not regulatory commitments. Please notify the Manager – Regulatory Affairs (419) 321-8450 at Davis-Besse of any questions regarding this document or associated regulatory commitments.

#### **COMMITMENTS**

None

#### **DUE DATE**

N/A

The following describes the method used to develop the written examination outline for Davis-Besse March 2002 Reactor Operator and Senior Reactor Operator NRC licensing examinations:

### **Reactor Operator Examination Outline Development**

1. The Davis-Besse Examination Development computer program was used to randomly select the topics/evolutions that are applicable to Davis-Besse from each examination outline group.
2. The computer program also randomly selected the K/A category within each of the selected topics/evolutions.
3. The K/As within each selected K/A category, with importance numbers 2.5 or greater, were sequentially numbered. The computer program random number generator was used to select each individual K/A.

### **Senior Reactor Operator Examination Outline Development**

1. The SRO examination outline was developed using the RO outline as the basis.
2. Some groups in the SRO outline require a different number of questions as compared to the groups in the RO outline. For SRO groups that required K/As from additional evolutions/topics, the additional evolutions/topics for those groups were randomly selected. For SRO groups that required K/As with fewer evolutions/topics than the RO groups, the evolutions/topics were randomly de-selected.
3. If the additionally selected evolutions/topics for each group in the SRO outline were used in a different group within the RO outline then the K/As selected for the RO outline were used in the SRO outline.
4. For the remaining evolutions/topics on the SRO outline, the computer program was used to randomly select the K/A category within each of the additional selected topics/evolutions.
5. The K/As within each additionally selected K/A category, with importance numbers 2.5 or greater, were sequentially numbered. The computer program random number generator was used to select each individual K/A.

Facility: Davis-Besse		Date of Examination: March 4, 2002		
Item	Task Description	Initials		
		a	b*	c#
1. W R I T E N	a. Verify that the outline(s) fit(s) the appropriate model per ES-401.	DB	DI	MGB
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all K/A categories are appropriately sampled.	DB	DI	MGB
	c. Assess whether the outline over-emphasized any systems, evolutions, or generic topics.	DB	DI	MGB
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.	DB	DI	MGB
2. S I M	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.	JEH	DI	MGB
	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.	JEH	DI	MGB
	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.	JEH	DI	MGB
3. W / T	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.	DB	DI	MGB
	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.	DB	DI	MGB
	c. Verify that the required administrative topics are covered, with emphasis on performance-based activities.	DB	DI	MGB
	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.	DB	DI	MGB
	e. Verify that the required administrative topics are covered, with emphasis on performance-based activities.	DB	DI	MGB
4. G E N E R A L	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam section.	DB	DI	MGB
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.	DB	DI	MGB
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	DB	DI	MGB
	d. Check for duplication and overlap among exam sections.	DB	DI	MGB
	e. Check the entire exam for balance of coverage.	DB	DI	MGB
	f. Assess whether the exam fits the appropriate job level (RO or SRO).	DB	DI	MGB
Printed Name / Signature		Date		
a. Author	John C. House / John C. House	12/03/01		
b. Facility Reviewer (*)	David M. Imray	12/03/01		
c. NRC Chief Examiner (#)	Michael E. Bielby Sr.	12/15/01		
d. NRC Supervisor	David S. Mills	12/15/01		
Note: * Not applicable for NRC-developed examinations # Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.				

Facility: Davis-Besse		Date of Examination: March 4, 2002		Scenario Numbers: 1 / 2 / 3		Operating Test No.: 1			
QUALITATIVE ATTRIBUTES						Initials			
						a	b*	c#	
1.	The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the operators into expected events.	SL*	DI	MBB					
2.	The scenarios consist mostly of related events.	SL*	DI	MBB					
3.	Each event description consists of: <ul style="list-style-type: none"> <li>the point in the scenario when it is to be initiated.</li> <li>the malfunction(s) that are entered to initiate the event.</li> <li>the symptoms/cues that will be visible to the crew</li> <li>the expected operator actions (by shift position)</li> <li>the event termination point (if applicable)</li> </ul>	SL*	DI	MBB					
4.	No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.	SL*	DI	MBB					
5.	The events are valid with regard to physics and thermodynamics.	SL*	DI	MBB					
6.	Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives.	SL*	DI	MBB					
7.	If time compression techniques are used, the scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.	N/A	DI	MBB					
8.	The simulator modeling is not altered.	SL*	DI	MBB					
9.	The scenarios have been validated. Any open simulator performance deficiencies have been evaluated to ensure that functional fidelity is maintained while running the planned scenarios.			MBB			*		
10.	Every operator will be evaluated using at least one new or significantly modifies scenario. All other scenarios have been altered in accordance with Section D.4 of ES-301.	SL*	DI	MBB					
11.	All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios).	SL*	DI	MBB					
12.	Each applicant will be significantly involved in the minimum number of transients and events specified on Form ES-301-5 (submit the form with the simulator scenarios).	SL*	DI	MBB					
13.	The level of difficulty is appropriate to support licensing decisions for each crew position.	SL*	DI	MBB					
<b>TARGET QUANTITATIVE ATTRIBUTES (PER SCENARIO; SEE SECTION D.4.D)</b>						Actual Attributes	-	-	-
1.	Total malfunction (5-8)		7 / 7 / 6	SL*	DI	MBB			
2.	Malfunctions after EOP entry (1-2)		1 / 3 / 2	SL*	DI	MBB			
3.	Abnormal events (2-4)		4 / 3 / 3	SL*	DI	MBB			
4.	Major transients (1-2)		1 / 1 / 2	SL*	DI	MBB			
5.	EOPs entered/requiring substantive actions (1-2)		1 / 1 / 1	SL*	DI	MBB			
6.	EOP contingencies requiring substantive actions (0-2)		1 / 0 / 1	SL*	DI	MBB			
7.	Critical tasks (2-3)		2 / 3 / 2	SL*	DI	MBB			

\* Scenarios will be validated after NRC approval. SL\*/DI

Facility: Davis Besse Nuclear Power Station Date of Examination: 03-04-02Examination Level (circle one): RO / SRO Operating Test Number: \_\_\_\_\_

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Risk Summary Update 2.1.14 3.3	Update Safety Monitor Risk Summary for taking MDFP out of service.
	COLR/TECH SPEC Utilization 2.1.11 3.8	Determine API in spec with alarms inoperable
A.2	Surveillance Testing 2.2.12 3.4	Perform Surveillance test for post accident panel, and determine instrument out of tolerance.
A.3	Radiation Control 2.3.2 2.9	Check out a radiation detector in the RRA
A.4	Emergency Plan Activate Cans 2.4.43 3.5	Activate the Computer Automated Notification System on an Alert.

Facility: Davis Besse Nuclear Power Station Date of Examination: 03-04-02Examination Level (circle one): RO SRO

Operating Test Number: \_\_\_\_\_

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Control of Locked Valves 2.1.1 3.7	Stroke timing of a Locked Valve
	COLR/TECH SPEC Utilization 2.1.11 3.0	Determine API in spec with alarms inoperable
A.2	Surveillance Testing 2.2.12 3.0	Perform Surveillance test for post accident panel, and determine instrument out of tolerance. SRO determine Tech Spec requirements
A.3	Radiation Control 2.3.2 2.5	Check out a radiation detector in the RRA
A.4	Emergency Plan Activate Cans 2.4.43 2.8	Activate the Computer Automated Notification System on an Alert.



Facility: Davis Besse Nuclear Power Station Date of Examination: 03-04-02  
 Exam Level (circle one): RO / SRO(I) / SRO(U) Operating Test No.: \_\_\_\_\_

**B.1 Control Room Systems**

System/ JPM Title	Type Code*	Safety Function
a. Perform PORV Cycle Test	N,A,S,L	3
b. Align ECCS Suction to Emergency Sump	M,S,L	2
c. Energize 4.16kv bus D2 from the SBODG	D,A,S	6
d. Borate the Makeup Tank using attach 13 of DB-OP-02000.	N,S	1
e. Trip an RPS Channel	D,A,S	7
f. Start CTMT Purge on the penetration rooms	N,S	8
g. Manually Trip SFAS	D,A,S	2

**B.2 Facility Walkthrough**

a. Primary Side Reactor Operator actions inside the RRA for Serious CTRM fire	D,R	2
b. Line up BUSW pmp to Service Water	D	4 Secondary
c. Loss of a TPCW pump	D	8

\* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: Davis Besse Scenario No.: 1 Op-Test No.: 1

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_

\_\_\_\_\_

Initial Conditions: 100% Power, 3 Circ. Pump operation, HPI Pump 1 out of service

\_\_\_\_\_

\_\_\_\_\_

Turnover: Return to 4 Circ. Pump operation

\_\_\_\_\_

\_\_\_\_\_

Event No.	Malf No.	Event Type*	Event Description
1	-----	N (ROS)	Start Circ. Water Pump 3
2	CT-03-4C	C (ROS)	Circ. Water Pump 3 Discharge Valve fails to open
3	RCS-10-12	I (ROP)	T-Hot input to SCM meter fails high
4	SG-06	I (ROS)	SG1 Startup level instrument midscale failure
5	MUP 12-1	C (ROP)	Makeup Pump 1 trip
6	MUP 12-2	C (ROP)	Makeup Pump 2 electrical fault
7	AC-06-2	C (All)	D1 bus lockout
8	-----	R (ROP)	Power reduction
9	RCS-02-4	M (All)	Small break LOCA, loss of SCM

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

Facility: Davis Besse Scenario No.: 2 Op-Test No.: 1

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_

Initial Conditions: 50% Power, both Main Feed Pumps in service, AFPT 2 is out of service

Turnover: Increase power to 100%, perform surveillance test on CCW Pump 3

Event No.	Malf No.	Event Type*	Event Description
1	-----	R (ROP)	Add water to the Makeup Tank
2	-----	N (ROP)	Start CCW Pump 3 for surveillance test
3	MFW 14-3	I (ROS)	MFW Control Valve delta pressure instrument fails low
4	MUP-16	I (ROP)	Seal Injection Flow Instrument fails low
5	CCW-08	C (All)	CCW System leak
6	CRD-04	C (ROP)	ATWS
7	AFW-02	C (ROS)	AFPT 1 overspeed trip
8	AFW-09	C (ROS)	MDFP Target Rock Valve fails open
9	MS-06	M (All)	Main Steam Safety Valve fails open, overcooling of the RCS

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

Facility: Davis Besse Scenario No.: 3 Op-Test No.: 1

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_

Initial Conditions: Mode 2, 2% power, startup in progress, MFP 2 out of service

Turnover: MFP 1 ready to be placed in service, thunderstorm watch in effect

Event No.	Malf No.	Event Type*	Event Description
1	-----	N (ROS)	Transfer from Motor Driven Feed Pump to MFP 1
2	-----	R (ROP)	Increase power to 5%
3	SG-04	I (ROS)	SG2 pressure instrument fails high
4	MUP-17	I (ROP)	Makeup Tank level instrument fails low
5	SG-01	C (All)	SG1 tube leak
6	AC-02	M (All)	Loss of off-site power
7	SW-07	C (ROP)	Service Water Pump 1 fails to auto start
8	SFRCS-02	C (ROS)	SFRCS fails to automatically actuate
9	SG-01	C (All)	SG1 tube rupture

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

Competencies	Applicant #1 RO/SRO-I/SRO-U				Applicant #2 RO/SRO-I/SRO-U				Applicant #3 RO/SRO-I/SRO-U			
	SCENARIO				SCENARIO				SCENARIO			
	1	2	3	4	1	2	3	4	1	2	3	4
Understand and Interpret Annunciators and Alarms	4,5,6,7,8	3,4,5,7	3,4,5,6,9		4,5,6,7,8	3,4,5,7	3,4,5,6,9		4,5,6,7,8	3,4,5,7	3,4,5,6,9	
Diagnose Events and Conditions	2,3,4,5,6,7	3,4,5,6,7,8,9	3,4,5,6,7,8,9		2,3,4,5,6,7,8,9	3,4,5,6,7,8,9	3,4,5,6,7,8,9		2,3,4,5,6,7,8,9	3,4,5,6,7,8,9	3,4,5,6,7,8,9	
Understand Plant and System Response	2,3,4,5,6,7	3,4,5,6,7,8,9	3,4,5,6,7,8,9		2,3,4,5,6,7,8,9	3,4,5,6,7,8,9	3,4,5,6,7,8,9		2,3,4,5,6,7,8,9	3,4,5,6,7,8,9	3,4,5,6,7,8,9	
Comply With and Use Procedures (1)	1,2,3,4,5,6,7,8,9	1,2,3,5,6,7,9	1,2,4,5,6,7,9		1,2,3,4,5,6,7,8,9	1,2,3,5,6,7,9	1,2,4,5,6,7,9		1,2,3,4,5,6,7,8,9	1,2,3,5,6,7,9	1,2,4,5,6,7,9	
Operate Control Boards (2)	1,2,4,5,6,8	1,2,3,4,5,6,7,8,9	1,2,3,4,5,7,8,9		1,2,4,5,8	1,2,3,4,5,6,7,8	1,2,3,4,6,7,8,9					
Communicate and Interact With the Crew	1,2,3,4,5,6,7,8	3,4,5,6,7,8,9	1,2,3,4,5,6,7,8,9		1,2,3,4,5,6,7,8,9	3,4,5,6,7,8,9	1,2,3,4,5,6,7,8,9		1,2,3,4,5,6,7,8,9	3,4,5,6,7,8,9		
Demonstrate Supervisory Ability (3)					1,2,3,4,5,6,7,8,9	3,4,5,7,8,9	2,3,4,5,7,8,9		1,2,3,4,5,6,7,8,9	3,4,5,6,7,8,9	2,3,4,5,7,8,9	
Comply With and Use Tech. Specs. (3)					5,6,7		5		5,6,7		5	

## Notes:

(1) Includes Technical Specification compliance for an RO.

(2) Optional for an SRO-U.

(3) Only applicable to SROs.

## Instructions:

Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author:

John C. House / John C House

NRC Reviewer:

Michael E. Bielby / Michael E. Bielby

## OPERATING TEST NO.:

Applicant Type	Evolution Type	Minimum Number	Scenario Number			
			1	2	3	4
RO	Reactivity	1	1	1	1	
	Normal	1	1	1	1	
	Instrument / Component	4	6	6	6	
	Major	1	1	1	1	

As RO	Reactivity	1	1	1	1	
	Normal	0	0	1	0	
	Instrument / Component	2	3	2	2	
	Major	1	1	1	1	
SRO-I	Reactivity	0	1	1	1	
	Normal	1	1	1	1	
	Instrument / Component	2	6	6	6	
	Major	1	1	1	1	
As SRO	Reactivity	0	1	1	1	
	Normal	1	1	1	1	
	Instrument / Component	2	6	6	6	
	Major	1	1	1	1	

SRO-U	Reactivity	0	1	1	1	
	Normal	1	1	1	1	
	Instrument / Component	2	6	6	6	
	Major	1	1	1	1	

- Instructions:
- (1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.
  - (2) Reactivity manipulations may be conducted under normal or controlled abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.
  - (3) Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirement.

Author:

John C. House / John C. House

NRC Reviewer:

Michael E. Bielby / Michael E. Bielby

Facility: Davis-Besse      Date of Exam: March 4, 2002      Exam Level: SRO													
Tier	Group	K/A Category Points										Point Total	
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4		G *
1. Emergency & Abnormal Plant Evolutions	1	2	4	5				4	7			2	24
	2	3	2	3				3	2			3	16
	3	1						1				1	3
	Tier Totals	6	6	8				8	9			6	43
2. Plant Systems	1	4	1	1	3	1	2	1	3	1	2	0	19
	2	2	1	2	1	2	1	2	2	1	2	1	17
	3				1				1		1	1	4
	Tier Totals	6	2	3	5	3	3	3	6	2	5	2	40
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		17
					5		4		4		4		
<p>Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p>2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by <math>\pm 1</math> from that specified in the table based on NRC revisions. The final exam must total 100 points.</p> <p>3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>6.* The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance rating for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p>													

ES-401		PWR SRO Examination Outline Emergency and Abnormal Plant Evolutions –Tier 1/Group 1						Form ES-401-3	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1					1		AA2.04-Reactor power trend	4.3	1
000003 Dropped Control Rod / 1		1	1				AK2.05-CRD power supplies/AK3.03-Turbine auto runback	2.8/3.7	2
000005 Inoperable/Stuck Control Rod / 1	1						AK1.03-Xenon transient	3.6	1
000011 Large Break LOCA / 3		1					EK2.02-Relationship with pumps	2.7	1
000015/17 RCP Malfunctions / 4			1				AK3.01-High bearing/winding temps	3.1	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4			1				EK3.4-Procedure adherence, teamwork	3.8	1
000024 Emergency Boration / 1			1				AK3.01-Emergency boration	4.4	1
000026 Loss of Component Cooling Water / 8			1				AK3.04-Effects on loss of CCW	3.7	1
000029 Anticipated Transient w/o Scram / 1					1		EA2.05-System component valve position indication	3.4	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture – Excessive Heat Transfer / 4				1			EA1.1-Components function of safety system	4.2	1
000051 Loss of Condenser Vacuum / 4						1	GEN2.4.8-Knowledge of event based vs symptom based	3.7	1
000055 Station Blackout / 6				1			EA1.02-Manual ED/G start	4.4	1
000057 Loss of Vital AC Elec. Inst. Bus / 6					1		AA2.11-MFP running indicator and controller	3.0	1
000059 Accidental Liquid Radwaste Rel. / 9					1		AA2.04-Valve lineup for release	3.5	1
000062 Loss of Nuclear Service Water / 4					1		AA2.06-Time after loss until component damage	3.1	1
000067 Plant Fire On-Site / 9				1			AA1.09-Plant fire zone panel	3.3	1
000068 (BW/A06) Control Room Evac. / 8						1	GEN2.4.5-Knowledge of organization of operating procedures	3.6	1
000069 (W/E14) Loss of CTMT Integrity / 5	1						AK1.01-Effect of pressure on leak rate	3.1	1
000074 (W/E06&E07) Inad. Core Cooling / 4		1					EK2.06-Knowledge between ICC and TBV/AVVs	3.6	1
BW/E03 Inadequate Subcooling Margin / 4				1	1		EA1.1-Components/functions control and safety system./EA2.02-Adherence to procedure	3.8/4.0	2
000076 High Reactor Coolant Activity / 9		1					AK2.01-Process Rad monitor	3.0	1
BW/A02&A03 Loss of NNI-X/Y / 7					1		AA2.1-Selection of appropriate procedures	4.0	1
K/A Category Totals:	2	4	5	4	7	2	Group Point Total:	24	



ES-401		PWR SRO Examination Outline Emergency and Abnormal Plant Evolutions –Tier 1/Group 2							Form ES-401-3	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points	
000007 (BW/E02&E10; CE/E02) Reactor Trip – Stabilization – Recovery / 1	1						EK1.1-Component, capacity, and function	4.0	1	
BW/A01 Plant Runback / 1						1	GEN-2.1.30-Ability to locate/operate controls	3.4	1	
BW/A04 Turbine Trip / 4						1	GEN-2.4.7-Knowledge of event based EOP	3.8	1	
000008 Pressurizer Vapor Space Accident / 3										
000009 Small Break LOCA / 3		1					EK2.03-S/Gs	3.3	1	
BW/E08; W/E03 LOCA Cooldown – Depress. / 4		1					EK2.1-Components,and function of control and safety systems	3.9	1	
W/E11 Loss of Emergency Coolant Recirc. / 4										
000022 Loss of Reactor Coolant Makeup / 2			1				AK3.07-Isolating charging	3.2	1	
000025 Loss of RHR System / 4	1						AK1.01-Loss of RHR all modes	4.3	1	
000027 Pressurizer Pressure Control System Malfunction / 3										
000032 Loss of Source Range NI / 7					1		AA2.06-Confirmation of reactor trip	4.1	1	
000033 Loss of Intermediate Range NI / 7			1				AK3.02-Guidance in EOP for loss of Intermediate range NIs	3.9	1	
000037 Steam Generator Tube Leak / 3				1			AA1.11-PZR level indication	3.3	1	
000038 Steam Generator Tube Rupture / 3				1			EA1.27-Steam dump valve status lights	3.9	1	
000054 (CE/E06) Loss of Main Feedwater / 4			1				AK3.02-Matching feedwater and steam flows	3.7	1	
BW/E04; W/E05 Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4	1						EK1.3-Annunciator condition,indication,and remedial action	4.0	1	
000058 Loss of DC Power / 6						1	GEN 2.1.29-Knowledge of how to conduct/verify valve lineups	3.3	1	
000060 Accidental Gaseous Radwaste Rel. / 9				1			AA1.02-Ventilation system	3.1	1	
000061 ARM System Alarms / 7										
W/E 16 High Containment Radiation / 9										
000065 Loss of Instrument Air / 8					1		AA2.01-Cause and effect of low pressure alarm	3.2	1	
CE/E09 Functional Recovery										
K/A Category Point Totals:	3	2	3	3	2	3	Group Point Total:		16	

ES-401		PWR SRO Examination Outline Emergency and Abnormal Plant Evolutions –Tier 1/Group 2						Form ES-401-3	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000007 (BW/E02&E10; CE/E02) Reactor Trip – Stabilization – Recovery / 1	1						EK1.1-Component, capacity, and function	3.6	1
BW/A01 Plant Runback / 1						1	GEN-2.1.30-Ability to locate/operate controls	3.4	1
BW/A04 Turbine Trip / 4						1	GEN-2.4.7-Knowledge of event based EOP	3.8	1
000008 Pressurizer Vapor Space Accident / 3									
000009 Small Break LOCA / 3		1					EK2.03-S/Gs	3.3	1
BW/E08; W/E03 LOCA Cooldown – Depress. / 4		1					EK2.1-Components, and function of control and safety systems	3.9	1
W/E11 Loss of Emergency Coolant Recirc. / 4									
000022 Loss of Reactor Coolant Makeup / 2			1				AK3.07-Isolating charging	3.2	1
000025 Loss of RHR System / 4	1						AK1.01-Loss of RHR all modes	4.3	1
000027 Pressurizer Pressure Control System Malfunction / 3									
000032 Loss of Source Range NI / 7					1		AA2.06-Confirmation of reactor trip	4.1	1
000033 Loss of Intermediate Range NI / 7			1				AK3.02-Guidance in EOP for loss of Intermediate range NIs	3.9	1
000037 Steam Generator Tube Leak / 3				1			AA1.11-PZR level indication	3.3	1
000038 Steam Generator Tube Rupture / 3				1			EA1.27-Steam dump valve status lights	3.9	1
000054 (CE/E06) Loss of Main Feedwater / 4			1				AK3.02-Matching feedwater and steam flows	3.7	1
BW/E04; W/E05 Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4	1						EK1.3-Annunciator condition, indication, and remedial action	4.0	1
000058 Loss of DC Power / 6						1	GEN 2.1.29-Knowledge of how to conduct/verify valve lineups	3.3	1
000060 Accidental Gaseous Radwaste Rel. / 9				1			AA1.02-Ventilation system	3.1	1
000061 ARM System Alarms / 7									
W/E 16 High Containment Radiation / 9									
000065 Loss of Instrument Air / 8					1		AA2.01-Cause and effect of low pressure alarm	3.2	1
CE/E09 Functional Recovery									
K/A Category Point Totals:	3	2	3	3	2	3	Group Point Total:		16

ES-401		PWR SRO Examination Outline Emergency and Abnormal Plant Evolutions –Tier 1/Group 3						Form ES-401-3	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2									
000036 (BW/A08) Fuel Handling Accident / 8									
000056 Loss of Off-site Power / 6	1						AK1.03-Use of steam table for SCM	3.4	1
BW/E13&E14 EOP Rules and Enclosures						1	GEN-2.4.39-Knowledge of E-Plan responsibility	3.1	1
BW/A05 Emergency Diesel Actuation / 6									
BW/A07 Flooding / 8				1			AA1.2-Behavior of facility	3.0	1
CE/A16 Excess RCS Leakage / 2									
W/E13 Steam Generator Over-pressure / 4									
W/E15 Containment Flooding / 5									
K/A Category Point Totals:	1			1		1	Group Point Total:		3

ES-401		PWR SRO Examination Outline Plant Systems – Tier 2/Group 1										Form ES-401-3		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive					1					1		K5.56-Determining SCM/A4.15-Stop boron dilution	4.6/3.1	2
003 Reactor Coolant Pump				1				1				K4.11-Isolation valve interlocks/A2.05-Effects of VCT on seals	3.0/2.8	2
004 Chemical and Volume Control						1						K6.07-Heat exchanger and condenser	2.8	1
013 Engineered Safety Features Actuation	1									1		K1.12-ED/Gs/A4.02-Reset of SFAS	4.4/4.4	2
014 Rod Position Indication														
015 Nuclear Instrumentation						1			1			K6.02-Discriminating/comp circuit/A3.02-Alarm signals	2.9/3.9	2
017 In-core Temperature Monitor			1									K3.01-Natural circ indication	3.7	1
022 Containment Cooling				1								K4.04-Cooling of CRDMs	3.1	1
025 Ice Condenser														
026 Containment Spray														
056 Condensate	1							1				K1.03-MFW/A2.04-Loss of pumps	2.6/2.8	2
059 Main Feedwater				1			1					K4.13-FW fill of SG loss of RCP/A1.07-FW pump speed control	2.9/2.6	2
061 Auxiliary/Emergency Feedwater		1										K2.02-Electric driven pump	3.7	1
063 DC Electrical Distribution														
068 Liquid Radwaste								1				A2.04-Failure of automatic isolation	3.3	1
071 Waste Gas Disposal	1											K1.05-Met tower	2.8	1
072 Area Radiation Monitoring	1											K1.04-CTRM ventilation	3.5	1
K/A Category Point Totals:	4	1	1	3	1	2	1	3	1	2	0	Group Point Total:		19

ES-401		PWR SRO Examination Outline Plant Systems – Tier 2/Group 2											Form ES-401-3		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points	
002 Reactor Coolant										1		A4.03-Indication/control/recognition and correct saturated conditions	4.4	1	
006 Emergency Core Cooling					1							K5.01-Effects of temp on water level indication	3.3	1	
010 Pressurizer Pressure Control				1								K4.03-Over pressure control	4.1	1	
011 Pressurizer Level Control										1		A4.04-Transfer to manual	2.9	1	
012 Reactor Protection							1					A1.01-Trip setpoint adjust	3.4	1	
016 Non-nuclear Instrumentation								1				A2.04-Voltage too HI or LOW	2.6	1	
027 Containment Iodine Removal															
028 Hydrogen Recombiner and Purge Control															
029 Containment Purge							1					A1.03-CTMT press/temp/humidity	3.3	1	
033 Spent Fuel Pool Cooling	1											K1.02-RHRS	2.7	1	
034 Fuel Handling Equipment															
035 Steam Generator															
039 Main and Reheat Steam	1											K1.05-TG	2.6	1	
055 Condenser Air Removal			1									K3.01-Main condenser	2.7	1	
062 AC Electrical Distribution									1			A3.04-Operation of inverters	2.9	1	
064 Emergency Diesel Generator			1									K3.03-ED/G manual loads	3.9	1	
073 Process Radiation Monitoring					1							K5.02-Rad intensity change	3.1	1	
075 Circulating Water		1									1	K2.03-Emer/essen SWS pumps/GEN-2.1.26-Knowledge of non-nuclear safety related procedures	2.7/2.6	2	
079 Station Air								1				A2.01-Crossconnect w IA system	3.2	1	
086 Fire Protection						1						K6.04-Fire/smoke/heat detectors	2.9	1	
103 Containment															
K/A Category Point Totals:	2	1	2	1	2	1	2	2	1	2	1	Group Point Total:		17	

ES-401		PWR SRO Examination Outline Plant Systems – Tier 2/Group 3										Form ES-401-3		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal														
007 Pressurizer Relief/ Quench Tank								1				A2.05-Exceeding PRT pressure limit	3.6	1
008 Component Cooling Water														
041 Steam Dump/Turbine Bypass Control										1		A4.08-Steam dump valves	3.1	1
045 Main Turbine Generator											1	GEN-2.4.50-Verify alarm/operate ctrls	3.3	1
076 Service Water														
078 Instrument Air				1								K4.02-Crossover to other air system	3.5	1
K/A Category Point Totals:				1				1		1	1	Group Point Total:		4
Plant-Specific Priorities														
Summary / Topic				Recommended Replacement for...				Reason				Points		
Plant-Specific Priority Total: (limit 10)														

Facility: Davis Besse		Date of Exam: March 4, 2002		Exam Level: SRO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.03	Knowledge of shift turnover	3.4	1	
	2.1.17	Ability to make accurate/clear/concise verbal report	3.6	1	
	2.1.19	Ability to use plant computer to obtain and evaluate data	3.0	1	
	2.1.27	Knowledge of system purpose and function	2.9	1	
	2.1.11	Knowledge of one hour Tech Spec actions	3.8	1	
	Total			5	
Equipment Control	2.2.12	Knowledge of surveillance procedures	3.4	1	
	2.2.27	Knowledge of refueling process	3.5	1	
	2.2.33	Knowledge of CRD programming	2.9	1	
	2.2.05	Knowledge of making changes in facility as described in the SAR	2.7	1	
	2.2.				
	Total			4	
Radiation Control	2.3.1	Knowledge of 10CFR20 and related facility radiation controls	3.0	1	
	2.3.10	Ability to perform procedures to reduce radiation	3.3	1	
	2.3.11	Ability to control radiation releases	3.2	1	
	2.3.05	Knowledge of use and function of personnel monitoring equipment	2.5	1	
	2.3.				
	2.3.				
Total			4		
Emergency Procedures/ Plan	2.4.09	Knowledge of low power/shutdown implication	3.9	1	
	2.4.26	Knowledge of facility fire protection requirements	3.3	1	
	2.4.39	Knowledge of RO responsibilities in E-Plan	3.1	1	
	2.4.43	Knowledge of emergency communication system	3.5	1	
	2.4.				
	Total			4	
Tier 3 Point Total (RO/SRO)				13/17	

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



ES-401		PWR RO Examination Outline Emergency and Abnormal Plant Evolutions –Tier 1/Group 1						Form ES-401-4	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1	1						AK1.03 Xenon Transient	3.2	1
000015/17 RCP Malfunctions / 4			1				AK3.01-Hi bearing/winding temp	2.5	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4			1				EK3.4-Procedure adherence, teamwork	3.8	1
000024 Emergency Boration / 1			1				AK3.01-Emergency boration	4.1	1
000026 Loss of Component Cooling Water / 8			1				AK3.04-Effects on loss of CCW	3.5	1
000027 Pressurizer Pressure Control System Malfunction / 3		1					AK2.03-Controllers and positioners	2.6	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture – Excessive Heat Transfer / 4				1			EA1.1-Components, function of safety system	4.2	1
CE/A11; W/E08 RCS Overcooling – PTS / 4									
000051 Loss of Condenser Vacuum / 4						1	GEN 2.4.8-Knowledge event based vs symptom based	3.0	1
000055 Station Blackout / 6				1			EA1.02-Manual ED/G start	4.3	1
000057 Loss of Vital AC Elec. Inst. Bus / 6					1		AA2.11-MFP running indicator and controller	2.9	1
000062 Loss of Nuclear Service Water / 4					1		AA2.06-Time after loss until component damage	2.8	1
000067 Plant Fire On-Site / 9									
000068 (BW/A06) Control Room Evac. / 8						1	GEN-2.4.5-Knowledge of organization of operating procedures	2.9	1
000069 (W/E14) Loss of CTMT Integrity / 5									
000074 (W/E06&E07) Inad. Core Cooling / 4		1					EK2.06-Knowledge between ICC and TBV/AVVs	3.5	1
BW/E03 Inadequate Subcooling Margin / 4					1		EA2.02-Adherence to procedures	3.5	1
000076 High Reactor Coolant Activity / 9		1					AK2.01-Process Rad monitor	2.6	1
BW/A02&A03 Loss of NNI-X/Y / 7					1		AA2.1-Selection of appropriate procedures	3.6	1
K/A Category Totals:	1	3	4	2	4	2	Group Point Total:		16

ES-401		PWR RO Examination Outline Emergency and Abnormal Plant Evolutions –Tier 1/Group 2						Form ES-401-4	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1					1		AA2.04-Reactor power trend	4.2	1
000003 Dropped Control Rod / 1									
000007 (BW/E02&E10; CE/E02) Reactor Trip – Stabilization – Recovery / 1	1						EK1.1-Component, capacity and function	3.6	1
BW/A01 Plant Runback / 1						1	GEN-2.1.30Ability to locate/operate controls	3.9	1
BW/A04 Turbine Trip / 4						1	GEN-2.4.7-Knowledge of event based EOP	3.1	1
000008 Pressurizer Vapor Space Accident / 3									
000009 Small Break LOCA / 3		1					EK2.03-S/Gs	3.0	1
000011 Large Break LOCA / 3		1					EK2.02-Relationship with pumps	2.6	1
W/E04 LOCA Outside Containment / 3									
BW/E08; W/E03 LOCA Cooldown – Depress. / 4									
W/E11 Loss of Emergency Coolant Recirc. / 4									
W/E01 & E02 Rediagnosis & SI Termination / 3									
000022 Loss of Reactor Coolant Makeup / 2			1				AK3.07-Isolating charging	3.0	1
000025 Loss of RHR System / 4	1						AK1.01-Loss of RHR during all modes	3.9	1
000029 Anticipated Transient w/o Scram / 1					1		EA2.05-System component valve position indication	3.4	1
000032 Loss of Source Range NI / 7					1		AA2.06-Confirmation of Reactor trip	3.9	1
000033 Loss of Intermediate Range NI / 7			1				AK3.02-Guidance in EOP for loss of Intermediate range NIs	3.6	1
000037 Steam Generator Tube Leak / 3									
000038 Steam Generator Tube Rupture / 3				1			EA1.27-Steam dump valve status lights	3.9	1
000054 (CE/E06) Loss of Main Feedwater / 4			1				AK3.02-Matching feedwater and steam flows	3.4	1
BW/E04; W/E05 Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4	1						EK1.3-Annunciator condition, indication, and remedial action	4.0	1
000058 Loss of DC Power / 6						1	GEN-2.1.29-Knowledge of how to conduct/verify valve lineups	3.4	1
000059 Accidental Liquid Radwaste Rel. / 9					1		AA2.04-Valve lineup for release	3.2	1
000060 Accidental Gaseous Radwaste Rel. / 9				1			AA1.02-Ventilation system	2.9	1
000061 ARM System Alarms / 7									
W/E 16 High Containment Radiation / 9									
CE/E09 Functional Recovery									
K/A Category Point Totals:	3	2	3	2	4	3	Group Point Total:		17

ES-401		PWR RO Examination Outline Emergency and Abnormal Plant Evolutions –Tier 1/Group 3						Form ES-401-4	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2									
000036 (BW/A08) Fuel Handling Accident / 8									
000056 Loss of Off-site Power / 6	1						AK1.03-Use of steam table for SCM	3.1	1
00065 Loss of Instrument Air / 8									
BW/E13&E14 EOP Rules and Enclosures						1	GEN-2.4.39-Knowledge of E-Plan responsibility	3.3	1
BW/A05 Emergency Diesel Actuation / 6									
BW/A07 Flooding / 8				1			AA1.2-Behavior of facility	2.8	1
CE/A16 Excess RCS Leakage / 2									
W/E13 Steam Generator Over-pressure / 4									
W/E15 Containment Flooding / 5									
K/A Category Point Totals:	1			1		1	Group Point Total:		3

ES-401		PWR RO Examination Outline Plant Systems – Tier 2/Group 1										Form ES-401-4		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive					1					1	1	K5.56-Determining SCM/A4.15-Stopboron dilution/GEN-2.1.33-Ability to recognize entry into Tech Specs	4.2/3.1/3.4	3
003 Reactor Coolant Pump				1				1		1		K4.11-Isolation valve interlocks/A2.05-Effects of VCT on seals/A4.08-RCP cooling water supplies	3.0/2.5/3.2	3
004 Chemical and Volume Control						1						K6.07-Heat exchanger and condenser	2.7	1
013 Engineered Safety Features Actuation	1									1		K1.12-ED/Gs/A4.02-Reset of SFAS	4.1/4.3	2
015 Nuclear Instrumentation						1			1			K6.02-Discriminating/comp circuits/A3.02-Alarm signals	2.6/3.7	2
017 In-core Temperature Monitor			1									K3.01-Natural circ indications	3.5	1
022 Containment Cooling				1					1			K4.04-Cooling of CRDMs/A3.01-Initiation of safeguards	2.8/4.1	2
025 Ice Condenser														
056 Condensate	1							1				K1.03-MFW/A2.04-Loss of pumps	2.6/2.6	2
059 Main Feedwater			1	1			1					K3.03-S/Gs/K4.13-FW fill of SG loss of RCP/A1.07-FW pump speed control	3.5/2.9/2.5	3
061 Auxiliary/Emergency Feedwater		1										K2.02-Electric driven pump	3.7	1
068 Liquid Radwaste								1				A2.04-Failure of automatic isolation	2.7	1
071 Waste Gas Disposal	1											K1.05-Met tower	2.7	1
072 Area Radiation Monitoring	1											K1.04-CTRM ventilation	3.3	1
K/A Category Point Totals:	4	1	2	3	1	2	1	3	2	3	1	Group Point Total:		23

ES-401		PWR RO Examination Outline Plant Systems – Tier 2/Group 1										Form ES-401-4		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive					1					1	1	K5.56-Determining SCM/A4.15-Stopboron dilution/GEN-2.1.33-Ability to recognize entry into Tech Specs	4.2/3.1/3.4	3
003 Reactor Coolant Pump				1				1		1		K4.11-Isolation valve interlocks/A2.05-Effects of VCT on seals/A4.08-RCP cooling water supplies	3.0/2.5/3.2	3
004 Chemical and Volume Control						1						K6.07-Heat exchanger and condenser	2.7	1
013 Engineered Safety Features Actuation	1									1		K1.12-ED/Gs/A4.02-Reset of SFAS	4.1/4.3	2
015 Nuclear Instrumentation						1			1			K6.02-Discriminating/comp circuits/A3.02-Alarm signals	2.6/3.7	2
017 In-core Temperature Monitor			1									K3.01-Natural circ indications	3.5	1
022 Containment Cooling				1					1			K4.04-Cooling of CRDMs/A3.01-Initiation of safeguards	2.8/4.1	2
025 Ice Condenser														
056 Condensate	1							1				K1.03-MFW/A2.04-Loss of pumps	2.6/2.6	2
059 Main Feedwater			1	1			1					K3.03-S/Gs/K4.13-FW fill of SG loss of RCP/A1.07-FW pump speed control	3.5/2.9/2.5	3
061 Auxiliary/Emergency Feedwater		1										K2.02-Electric driven pump	3.7	1
068 Liquid Radwaste								1				A2.04-Failure of automatic isolation	3.3	1
071 Waste Gas Disposal	1											K1.05-Met tower	2.7	1
072 Area Radiation Monitoring	1											K1.04-CTRM ventilation	3.3	1
K/A Category Point Totals:	4	1	2	3	1	2	1	3	2	3	1	Group Point Total:		23

ES-401		PWR RO Examination Outline Plant Systems – Tier 2/Group 2										Form ES-401-4		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant										1		A4.03-Indication/control/recognition and correct saturated conditions	4.3	1
006 Emergency Core Cooling					1							K5.01-Effects of temp on water level indication	2.8	1
010 Pressurizer Pressure Control				1								K4.03-Over pressure control	3.8	1
011 Pressurizer Level Control										1		A4.04-Transfer to manual	3.2	1
012 Reactor Protection							1					A1.01-Trip setpoint adjust	2.9	1
014 Rod Position Indication											1	GEN-2.1.21-Obtain/verify procedure	3.1	1
016 Non-nuclear Instrumentation								1				A2.04-Voltage too HI or LOW	2.5	1
026 Containment Spray			1									K3.02-Recirc spray system	4.2	1
029 Containment Purge							1					A1.03-CTMT press/temp/humidity	3.0	1
033 Spent Fuel Pool Cooling	1											K1.02-RHRS	2.5	1
035 Steam Generator									1			A3.01-SG water level control	4.0	1
039 Main and Reheat Steam	1											K1.05-TG	2.5	1
055 Condenser Air Removal			1									K3.01-Main condenser	2.5	1
062 AC Electrical Distribution									1			A3.04-Operation of inverters	2.7	1
063 DC Electrical Distribution				1								K4.02-Breaker interlock	2.9	1
064 Emergency Diesel Generator			1									K3.03-ED/G manual loads	3.6	1
073 Process Radiation Monitoring					1							K5.02-Rad intensity change	2.5	1
075 Circulating Water		1										K2.03-Emer/essen SWS pumps	2.6	1
079 Station Air								1				A2.01-Crossconnect w/ IA system	2.9	1
086 Fire Protection						1						K6.04-Fire/smoke/heat detectors	2.6	1
K/A Category Point Totals:	2	1	3	2	2	1	2	2	2	2	1	Group Point Total:		20

ES-401		PWR RO Examination Outline Plant Systems – Tier 2/Group 3										Form ES-401-4		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal						1						K6.03-Loss of heat exchanger	2.5	1
007 Pressurizer Relief/Quench Tank								1				A2.05-Exceeding PRT pressure limit	3.2	1
008 Component Cooling Water			1									K3.03-RCP	4.1	1
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control														
034 Fuel Handling Equipment														
041 Steam Dump/Turbine Bypass Control										1		A4.08-Steam dump valves	3.0	1
045 Main Turbine Generator											1	GEN-2.4.50-Verify alarm/operate ctrls	3.3	1
076 Service Water	1											K1.01-CCW System	3.4	1
078 Instrument Air				1								K4.02-Crossover to, other air system	3.2	1
103 Containment									1			A3.01-CTMT isolation	3.9	1
K/A Category Point Totals:	1		1	1		1		1	1	1	1	Group Point Total:		8
Plant-Specific Priorities														
Summary / Topic		Recommended Replacement for...					Reason					Points		
Plant-Specific Priority Total: (limit 10)														

Facility: Davis Besse		Date of Exam: March 4, 2002		Exam Level: RO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.03	Knowledge of shift turnover	3.0	1	
	2.1.17	Ability to make accurate/clear/concise verbal report	3.5	1	
	2.1.19	Ability to use plant computer to obtain and evaluate data	3.0	1	
	2.1.27	Knowledge of system purpose and function	2.8	1	
	2.1.				
	Total			4	
Equipment Control	2.2.12	Knowledge of surveillance procedures	3.0	1	
	2.2.27	Knowledge of refueling process	2.6	1	
	2.2.33	Knowledge of CRD programming	2.5	1	
	2.2.				
	2.2.				
	2.2.				
Total			3		
Radiation Control	2.3.1	Knowledge of 10CFR20 and related facility radiation controls	2.6	1	
	2.3.10	Ability to perform procedures to reduce radiation	2.9	1	
	2.3.11	Ability to control radiation releases	2.7	1	
	2.3.				
	2.3.				
	2.3.				
Total			3		
Emergency Procedures/ Plan	2.4.09	Knowledge of low power/shutdown implication	3.3	1	
	2.4.26	Knowledge of facility fire protection requirements	2.9	1	
	2.4.39	Knowledge of RO responsibilities in E-Plan	3.3	1	
	2.4.				
	2.4.				
	Total			3	
Tier 3 Point Total (RO/SRO)				13/17	



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Outline Review NRC Comments/ LIC Response  
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WRITTEN:

1. NRC: What computer program do you use to randomly select KAs?

LIC: Skyscraper program developed by the site.

2. NRC: Were any KAs suppressed/rejected?

LIC: No, except for the KAs in the Catalog that are not designated for B&W.

(Not applicable questions: Were justification statements prepared? Were KAs suppressed/rejected/justified on a case-by-case basis? Which ones? Why? How many? We need to review the suppressed/rejected/justified KA information.)

ADMIN JPMs:

1. Make sure the admin JPMs have significant, verifiable consequences such that if they are performed incorrectly, the task cannot be successfully completed. For example, key control does not appear to have significant consequence of incorrectly performed.

2. NRC: RO A.1a), Control of Locked Valves, Stroke Timing of a Locked Valve; 2.1.1, Knowledge of conduct of operations requirements (41.10, 45.13). a) What is involved with this admin JPM? This appears to be equipment control and probably belongs under A.2, however; I am willing to accept if you get a more appropriate KA, such as 2.1.29, Knowledge of how to conduct and verify valve lineups; or 2.1.20, Ability to execute procedural steps. (CHANGE KA or REPLACE A.1a) for RO?)

LIC: Emphasis is on the required paperwork that needs to be filled out and approved for performance of the surveillance on a locked valve.

NRC: KA appears appropriate based on licensee response. Review the JPM in more detail once exam is received.

3. NRC: SRO A.1a), Risk Summary Update, Update Safety Monitor Risk Summary for taking MDFP out of service; 2.1.14, Knowledge of system status criteria which require the notification of plant personnel (43.5, 45.12). a) Is information obtained from a computer? b) I would prefer that this admin JPM require the SRO to evaluate equipment out of service and make a determination that it is too risky to take this piece of equipment out of service. (REVISE A.1a) for SRO?)

LIC: Information is obtained from a computer. There is equipment initially OOS, the SRO must input the information, then evaluate the output information and determine if the equipment can be taken OOS.

4. NRC: SRO/RO A.1b), COLR(core operating limits requirements)/TECH SPEC Utilization, Determine API (axial power imbalance) in spec with alarms inoperable; 2.1.11, Knowledge of conduct of operations requirements (41.10, 45.13). a) Is this appropriate for an RO? Need an admin JPM that discriminates between SRO and RO tasks. Would be OK if RO has some procedural actions to take. Then it would be appropriate for the SRO to review the actions taken and verify the applicable tech spec LCO, or the like. REVISE A.1b) for SRO/RO?)

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LIC: RO required to identify problem based on printout, and notify the SRO. The SRO is required to review the information and identify the correct TS LCO requirement.

5. NRC: SRO and RO A.2 The writeups for the SRO and RO are reversed on the outline. (REVERSE RO and SRO A.2 OUTLINE WRITEUP)

LIC: Will review and fix.

6. NRC: SRO/RO A.3, RADIATION CONTROL, Check out a radiation detector in the RRA; 2.3.2, Knowledge of facility ALARA program (41.12, 43.4, 45.9/10). a) The JPM does not appear to match the KA. b) Does the JPM have significant, verifiable consequences such that if they are performed incorrectly, the task cannot be successfully completed? Are there procedural requirements for checking out the rad detector? c) Does the admin JPM task discriminate between SRO and RO? d) (REPLACE A.3 for SRO, and RO(?))

LIC: Operators are required to perform checks on the detectors. Will pick a more appropriate KA.

7. NRC: SRO/RO A.4, Emergency Plan, Activate the Computer Automated Notification System (CANS) on an ALERT; 2.4.43, Knowledge of emergency communications systems and techniques (45.13). a) This is ok for RO, but not SRO. Would prefer to have the SRO make a classification and PARS recommendation. (REPLACE A.4 for SRO)

LIC: This is a new process. There are applicable RO and SRO parts to it.

#### OPERATING JPMs:

General: Want alternate path JPMS to follow guidance in Appendix C, ie, procedurally driven (ARPs or ABNs are good), completes the task or mitigates the problem without reliance on actions by other control room operators...

1. I need to review a list of audit exam JPMs (to verify none of those JPMs are repeated on the NRC exam).

2. NRC: Replace either B.1.b or B.1.g. Ref: ES-301, D.3.a, "...All of the systems and evolutions in each subcategory of the test should be selected from different safety function lists, and the same system or evolution should not be used to evaluate more than one safety function in each subcategory."

LIC: Will look at and replace.

#### SCENARIOS:

Scenario 1:

1. NRC: Events 5 and 6, are parts of one event (loss of makeup pumps). As such, they can only be counted as one failure.

LIC: Will review.

2. Only one failure after the MT, want additional failures so recovery is not straight forward and predictable.

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Scenario 2:

1. NRC: Events 5, 6, 7, 8, why are these component failures? Can the systems be recovered through proper operator actions and used to mitigate plant conditions (ie, CCW system leak stopped, rods successfully inserted, AFPT1 recovered and used for level control, Target Rock Valve closed) If not, they are probably enhancements to the MT.

LIC: CCW leak gives procedural actions to take. Rods can be inserted. AFPT doesn't auto start, must be manually started. MDFP valve has to be isolated.

Scenario 3:

1. NRC: Event 7, what is significance of SW Pump 1 failing to auto start?

LIC: Have to manually start.