Facility:	Davis-Besse	Date of Examination:	7/18/2005
Examination Level (circle one):	**RO**	Operating Test Number:	**NRC**

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	P	Perform a Shutdown Margin Calculation in accordance with DB-NE-06202, REACTIVITY BALANCE CALCULATIONS. 2.1.25 (2.8) 2004 NRC Exam A1-2
Conduct of Operations	N	Perform RCS Hot Leg Monthly Channel Check in accordance with DB-SC-03166, RCS HOT LEG LEVEL MONTHLY CHANNEL CHECK. 2.1.19 (3.0)
Equipment Control		NOT SELECTED
Radiation Control	N	Perform quarterly functional test of radiation elements 5052A, B, and C to determine operability in accordance with DB-SC-03227, QUARTERLY FUNCTIONAL TEST OF 5052A, B, and C, CTMT PURGE EXHAUST RADIATION MONITOR, prior to initiation of containment purge, 2.3.9 (2.5)
Emergency Plan	M	Calculate a projected offsite Total Effective Dose Equivalent (TEDE) rate in accordance with RA-EP-02240, OFFSITE DOSE ASSESSMENT. 2.4.39 (3.3) Modify Bank JPM 072

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.

*Type Codes & Criteria:
(C)ontrol room
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (> 1)
(P)revious 2 exams (≤ 1; randomly selected)
(S)imulator

DAVIS-BESSE RO NRC ADMINISTRATIVE TOPICS OUTLINE SUMMARY:

Perform a Shutdown Margin Calculation in accordance with DB-NE-06202, REACTIVITY BALANCE CALCULATIONS. Candidate will do a hand calculation of shutdown margin following a reactor trip with stuck rods. A randomly-selected repeat JPM from the facility's 2004 NRC Examination.

SETTING: Classroom or Plant

Perform Hot Leg Level Monthly Channel check. This task requires use of the simulator or other computer to take readings, perform a calculation, compare the results to a computer point, and verify the results are within tolerance. New JPM.

SETTING: Classroom or Simulator

Perform quarterly functional test of radiation elements 5052A, B, C to determine operability prior to containment purge initiation in accordance with DB-SC-03227. New JPM.

SETTING: Simulator

Given a set of conditions, the candidate will calculate a projected offsite Total Effective Dose Equivalent (TEDE) rate in accordance with RA-EP-02240, OFFSITE DOSE ASSESSMENT. Change conditions on Bank JPM (072) used on a previous NRC examination.

SETTING: Classroom or Plant

Facility:	Davis-Besse	Date of Examination:	7/18/2005
Examination Level (circle one):	**SRO**	Operating Test Number:	**NRC**

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M	Review (for approval) an Estimated Critical Boron Concentration calculation (with one more errors) in accordance with DB-NE-06202, REACTIVITY BALANCE CALCULATIONS. 2.1.25 (3.1) Modify Bank JPM-059
Conduct of Operations	P	Evaluate Axial Power Imbalance (API) with alarms inoperable in accordance with DB-NE-03220, IMBALANCE, TILT, AND ROD INDEX CALCULATIONS – GROUP 39 ALARMS INOPERABLE, ATTACHMENT 1. 2.1.12 (4.0) 2002 NRC Exam A1-2
Equipment Control	N	Initiate tracking of the Spent Fuel Pool Negative Pressure Area Barrier in accordance with DB-OP-00018, Inoperable Equipment Tracking Log. 2.2.24 (3.8)
Radiation Control	N	Perform quarterly functional test of radiation elements 5052A, B, and C to determine operability in accordance with DB-SC-03227, QUARTERLY FUNCTIONAL TEST OF 5052A, B, and C, CTMT PURGE EXHAUST RADIATION MONITOR, prior to initiation of containment purge, 2.3.9 (3.4)
Emergency Plan	M	Given a set of conditions, make a Protective Action recommendation in accordance with RA-EP-02245. 2.4.44 (4.0) Modify Bank JPM-150

NOTE: All items (5 total are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.

*Type Codes & Criteria:	(C)ontrol room (D)irect from bank (≤ 3 for ROs; ≤ for SROs & RO retakes) (N)ew or (M)odified from bank (> 1) (P)revious 2 exams (≤ 1; randomly selected) (S)imulator

DAVIS-BESSE SRO NRC ADMINISTRATIVE TOPICS OUTLINE SUMMARY:

Review (for approval) an Estimated Critical Boron concentration calculation (with one or more errors) in accordance with DB-NE-06202, REACTIVITY BALANCE CALCULATIONS. As Unit Supervisor, the candidate will review a prepared Estimated Critical Boron concentration calculation that contains more than one error. Modification of a Facility Bank JPM.

SETTING: Classroom or Plant

Evaluate Axial Power Imbalance (API) with alarms inoperable in accordance with DB-NE-03220, IMBALANCE, TILT, AND ROD INDEX CALCULATIONS - GROUP 38 ALARMS INOPERABLE, ATTACHMENT 1. Candidate will complete the attachment and evaluate technical specification compliance. A randomly-selected repeat JPM from the facility's 2002 NRC Examination.

SETTING: Classroom

Initiate tracking of the Spent Fuel Pool Negative Pressure Area Barrier in accordance with DB-OP-00018, Inoperable Equipment Tracking Log will require the applicant to determine barrier operability when presented with a planned maintenance activity such as a seal injection filter changeout. New JPM

SETTING: Classroom or Plant

Perform quarterly functional test of radiation elements 5052A, B, C to determine operability prior to containment purge initiation in accordance with DB-SC-03227. New JPM.

SETTING: Simulator

Given a set of conditions, make a Protective Action Recommendation (PAR) in accordance with RA-EP-02245, PROTECTIVE ACTION GUIDELINES. Candidate will complete the Attachment(s) for making a PAR. Modification of a Facility Bank JPM.

SETTING: Classroom or Plant

Facility:	Davis-Besse		Scenario No.: 1	Op Test No.:	NRC 2005
Examiners:			Operators:		
Initial Conditions:	• 80% power, MOL				
	• AFPT #1 tagged OOS.				
	• Containment Air cooler (CAC) #1 tagged OOS				
	• CAC-3 is aligned for Train 1				
Turnover:	Hold at 80% power while the Reactor Engineer reviews the calorimetric calculation completed at the end of the last shift.				

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	TS-SRO	AO reports oil leak on Train 1 Containment Spray Pump.
2	RCP-07	C-RO, SRO	RCP 1st Stage Seal failure on RCP 1-1.
3		R-RO N-SRO TS-SRO	Power reduction prior to stopping RCP 1-1.
4	RCS-10	I-RO, BOP, SRO	RCS Hot Leg RTD slowly drifts HI.
5	RCP-01	M-ALL	RCP 1-2 Breaker trips. Reactor Trip required.
6	RPS-01	C-RO	AUTO and MANUAL Reactor trip fails.
7	PZR-01	M-ALL	PZR Safety Valve fails OPEN, initiating SFAS.
8	HPI-02, 03	C-RO	HPIP 1 trips. HPIP 2 fails to automatically start.

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

Op Test No.: 1	Scenario # All	Event # 5, 6, 7, & 8	Page 2 of 2
Event Description:	RCP 1-2 Breaker Trips; Reactor Trip Required; AUTO and MANUAL Reactor Trip Fails; PZR Safety Valve Fails OPEN, Initiating SFAS; HPIP 1 Trips; HPIP 2 Fails to Automatically Start		

Time	Position	Applicant's Actions or Behavior

DAVIS-BESSE 2005 NRC EXAM SIMULATOR SCENARIO 1 GENERAL DESCRIPTION

The crew will take the watch with power holding at 80% power while the Reactor Engineer reviews the calorimetric calculation completed at the end of the last shift.

On cue from the Lead Evaluator, an AO will call the control room to report an oil leak on Containment Spray (CS) Pump #1. The SRO should request assistance from maintenance and/or enter the applicable TS. If necessary, a maintenance supervisor will report that the pump must be tagged OOS in order to make the repairs.

After the SRO has declared the TS for the CS Pump, the Lead Evaluator can cue the RCP 1-1 seal failure. The crew should respond to alarm 6-3-A in accordance with DB-OP-02006, REACTOR COOLANT PUMP ALARM PANEL 6 ANNUNCIATORS, and then enter DB-OP-02515, REACTOR COOLANT PUMP AND MOTOR ABNORMAL OPERATION. DB-OP-02515 will require the crew to reduce power to ≤72% in accordance with DB-OP-02504, RAPID SHUTDOWN, and stop the affected RCP. The SRO should enter the proper TS after the RCP is stopped.

On cue from the Lead Evaluator, the RCS Thot selected on HIS3A and for "Tave" or "UNIT" will begin to drift HI. The crew should respond to alarm 4-2-B or indications in accordance with DB-OP-02004, REACTOR COOLANT ALARM PANEL 4 ANNUNCIATORS. The affected controls should be shifted to an alternate channel and the channel should be removed from service. The channel does not have to be removed from service to proceed with the scenario.

The Lead Evaluator can cue RCP 1-2 breaker trip when evaluation on the Thot failure is complete. The crew should recognize that an AUTO reactor trip should have occurred and attempt to initiate a MANUAL reactor trip. This will fail and the RO should initiate a reactor trip by momentarily de-energizing Busses E2 and F2. Coincident with the reactor trip a PZR Safety Valve will fail sufficiently open to cause an SFAS actuation. HPIP #1 will trip and HPIP #2 will fail to automatically start. The crew should enter DB-OP-02000 - RPS, SFAS, SFRCS TRIP, OR S/G TUBE RUPTURE, and, among other actions, perform the following high level activities: verify the reactor is tripped, start HPIP #2, complete the actions for lack of adequate subcooling margin.

The Lead Evaluator can terminate the scenario when all high level activities have been completed and the evaluators agree the crew can be properly evaluated.

Facility:	DAVIS-BESSE	Scenario No.:	2	Op Test No.:	NRC 2005
Examiners:		Operators:			

Initial Conditions:
- 100% power, EOL
- AFPT #1 tagged OOS
- Containment Air Cooler #1 tagged OOS
- CAC #3 is aligned for Train 1

Turnover: Maintain 100% power.

Event No.	Malf. No.	Event Type*	Event Description
1		TS-SRO	SFRCS Power Supply Failure.
2		C-BOP, SRO	Condensate Pump Trip.
3		I-ALL	Steam Pressure Transmitter Failure.
4	CCW-01 CCW-02	C-RO, SRO TS-SRO	CCW Pump trip/failure of AUTO start on standby pump.
5	AC-05	M-ALL	Loss of one 13.8KV Bus.
6	MS-06	C-ALL	One Main Steam Safety Valve fails partially OPEN.
7	SFRCS-02	C-BOP, SRO	Failure of AUTO SFRCS actuation.

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

Op Test No.: 1	Scenario # 2	Event # 5, 6, & 7	Page 2 of 2
Event Description:	Loss of One 13.8KV Bus; One Main Steam Safety Valve Fails Partially OPEN; Failure of AUTO SFRCS Actuation		

Time	Position	Applicant's Actions or Behavior

DAVIS-BESSE 2005 NRC EXAM SIMULATOR SCENARIO 2 GENERAL DESCRIPTION

The crew will take the watch with directions to maintain 100% power.

On cue from the Lead Evaluator, an SFRCS power supply failure will occur. The crew will respond to multiple annunciators, check the SFRCS cabinets, and determine that a 28 VDC power supply has failed. The SRO will refer to DB-OP-06406 and Technical Specifications to determine required action.

The Lead Evaluator can cue the Condensate Pump failure any time after the declaration of the SFRCS TS. The crew will respond to annunciators and the BOP will manually throttle CD-420 and 421 to maintain Deaerator level in accordance with DB-OP-02013.

When the plant is stable following the Condensate Pump trip, a Steam header Pressure transmitter will fail, requiring the crew to place the turbine in MANUAL and raise SG pressure, and to place the SG/RX Demand in HAND to stabilize the plant. The crew will refer to DB-OP-06407 for the NNI failure, and DB-OP-06401 to restore ICS to full automatic operation.

Anytime after the plant is stabilized, the Lead Evaluator can cue the trip of a running Component Cooling Water (CCW) Pump. The crew should respond to alarm 11-4-B in accordance with DB-OP-02011, HEAT SINK ALARM PANEL 11 ANNUNCIATORS, and then implement DB-OP-02523, COMPONENT COOLING WATER SYSTEM MALFUNCTIONS. The RO should manually start the standby pump before RCP/reactor trip criteria is met.

After the standby CCW Pump has been started and the non-essential CCW Header isolation valves are closed on the failed pump, the Lead Evaluator can cue the loss of one 13.8KV Bus. This results in a reactor trip and entry into DB-OP-02000. One main steam safety valve will fail partially open and SFRCS will fail to actuate in AUTO. Flow through the main steam safety valve will be limited to avoid SFAS actuation. Among other actions, the crew will perform the following high level activities: actuate SFRCS, perform overcooling actions, and initiate MU/HPI cooling with only one vital bus available.

The Lead Evaluator can terminate the scenario when all high level activities have been completed and the evaluators agree the crew can be properly evaluated.

Facility:	Davis-Besse	Scenario No.:	3	Op Test No.:	NRC 2005
Examiners:		Operators:			

Initial Conditions:
- 70% power, BOL
- AFPT #1 tagged OOS
- Containment Air Cooler (CAC) #1 tagged OOS
- CAC #3 is aligned for Train 1

Turnover: MFPT #1 has a leak on the inboard bearing supply line. The previous shift initiated a power reduction to take MFPT #1 out of service for repairs. Continue the power reduction and remove MFPT #1 from service.

Event No.	Malf. No.	Event Type*	Event Description
1		N-SRO R-RO	Controlled power reduction
2	MFW-11	C-BOP, SRO	Increasing vibration on MFPT #1 requiring manual trip
3	ICS-02	C-RO, SRO	ICS AUTO Runback fails
4	RCS-13	I-RO, SRO TS-SRO	RCS Pressure instrument selected for NNI input fails LO
5		TS-SRO	120VAC Inverter alarm actuates in the control room
6	SG-01	C-BOP, SRO	OTSG Tube Leak
7	MFW-01	M-ALL	MFPT #2 trips
8	SG-01	C-ALL	OTSG tube leak rises to rupture following the reactor trip
9	PZR-02	C-RO	PZR Spray Valve fails CLOSED during depressurization

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

Op Test No.: 1	Scenario # 3	Event # 7, 8 & 9	Page 2 of 3
Event Description:	MFPT #2 Trips; OTSG Tube Leak Rises to Rupture Following the Reactor Trip; PZR Spray Valve Fails CLOSED During Depressurization		

Time	Position	Applicant's Actions or Behavior

DAVIS-BESSE 2005 NRC EXAM SIMULATOR SCENARIO 3 GENERAL DESCRIPTION

The crew will take the watch with power holding between 70%. The previous shift initiated a power reduction to take MFPT #1 out of service for repairs. Directions will be to continue the power reduction and remove MFPT #1 from service for repair of an oil leak.

Any time after the power reduction is initiated the Lead Evaluator can cue initiation of rising vibration levels on MFPT #1. The crew should respond to alarm 10-3-A in accordance with DB-OP-02010, FEEDWATER ALARM PANEL 10 ANNUNCIATORS. The Auxiliary Operator (AO) will report a vibration level exceeding the threshold for tripping the pump. The crew should trip MFPT #1, recognize that an AUTO runback did not initiate and then manually runback power to within the capacity of one MFWP.

The Lead Evaluator can cue initiation of failure of the RCS pressure channel selected for NNI input after the plant is stabilized. The crew should respond to alarm 4-4-C in accordance with DB-OP-02004, REACTOR COOLANT ALARM PANEL 4 ANNUNCIATORS. The operator should return the heaters to the correct alignment for the conditions, the channel should be removed from service and the SRO should enter the correct TS. The channel does not have to be removed from service to proceed with the scenario.

Any time after the RCS pressure channel actions are complete, the Lead Evaluator can cue actuation of alarm 1-6-A, INV YV1-YV-3 TRBL. The crew should respond in accordance with DB-OP-02001, ELECTRICAL DISTRIBUTION ALARM PANEL 1 ANNUNCIATORS, and dispatch an AO to investigate. The AO will report that one of the inverters has shifted to the alternate source. The SRO should request maintenance assistance and/or enter the correct TS. If necessary, the maintenance supervisor will report an electrical problem that indicates the normal supply cannot be restored until corrective actions are completed.

Any time after the SRO has entered the TS for the 120VAC problem, the Lead Evaluator can cue initiation of the OTSG tube leak. The crew should respond to alarm 9-4-A in accordance with DB-OP-02009, PLANT SERVICES ALARM PANEL 9 ANNUNCIATORS, which will direct them to DB-OP-02531, STEAM GENERATOR TUBE LEAK, for actions. The simulator operator will maintain leak rate greater than the TS limit but less than DB-OP-02000 entry. After the crew has recognized the tube leak and/or the SRO is evaluating the tube leak TS, the Lead Evaluator can cue the MFPT #2 trip. This results in a reactor trip and entry into DB-OP-02000. After the crew has entered DB-OP-02000, the OTSG tube leak will ramp to a size below SFAS actuation. Among other actions, the crew will perform the following high level activities: establish

Op Test No.: 1	Scenario # 3	Event # 7, 8 & 9	Page 3 of 3
Event Description:	MFPT #2 Trips; OTSG Tube Leak Rises to Rupture Following the Reactor Trip; PZR Spray Valve Fails CLOSED During Depressurization		

Time	Position	Applicant's Actions or Behavior

HPI piggyback operation, depressurize the RCS using pressurizer PORV when the spray valve fails closed.

The Lead Evaluator can terminate the scenario when all high level activities have been completed and the evaluators agree the crew can be properly evaluated.

Facility:	Davis-Besse		Scenario No.: 4	Op Test No.:	NRC 2005
Examiners:			Operators:		

Initial Conditions:
- 100% power, MOL
- AFPT #1 tagged OOS
- Containment Air Cooler #1 tagged OOS
- CAC #3 is aligned for Train 1

Turnover: Maintain 100% power.

Event No.	Malf. No.	Event Type*	Event Description
1		I-RO, SRO TS-SRO	SFAS Containment Pressure transmitter fails low
2	MFW-06	C-BOP, SRO	HP FW Heater Tube leak
3		N-SRO R-RO	Controlled power reduction
4	SA-02, 03	C-BOP, SRO	SAC #1 trips and SAC #2 fails to load Emergency Instrument Air Compressor fails to AUTO start.
5	AC-06	C-RO, SRO TS-SRO	Bus D1 locks out
6	RCS-02	M-ALL	Rapidly progressing RCS leak rate
7		C-RO	SFAS L3 Output Module Failure (LPIP #1 fails to start and CC-1467 fails to re-position)

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

Op Test No.: 1	Scenario # 5	Event # 6 & 7	Page 2 of 3
Event Description:	Rapidly Progressing RCS Leak Rate; SFAS L3 Output Module Failure (LPIP #1 Fails to Start and CC-1467 Fails to Re-Position)		

Time	Position	Applicant's Actions or Behavior

DAVIS-BESSE 2005 NRC EXAM SIMULATOR SCENARIO 4 GENERAL DESCRIPTION

The crew will take the watch with directions to maintain 100% power.

On cue from the Lead Evaluator, a Containment Pressure transmitter will fail high. The crew should respond to alarm 5-1-B, SFAS CTMT PRESS HI CH TRIP, in accordance with DB-OP-02005, PRIMARY INSTRUMENTATION ALARM PANEL 5 ANNUNCIATORS. The SRO should enter the correct TS and direct the RO to reset the tripped bistable.

Any time after the containment pressure channel actions are complete, the Lead Evaluator can cue initiation of the HP FW Tube leak. The crew should respond in accordance with DB-OP-02013, CONDENSATE FEEDWATER ALARM PANEL 13 ANNUNCIATORS. DB-OP-02013 will direct them to DB-OP-06229, HIGH PRESSURE FEEDWATER HEATER SYSTEM OPERATION. DB-OP-06229 requires a power reduction to ≤95% prior to removing the heater from service.

After the feedwater heater is removed from service, the Lead Evaluator can cue the trip of the running Station Air Compressor (SAC). The standby SAC will fail to load and the Emergency Instrument Air Compressor (EIAC) fails to automatically start. The crew should respond in accordance with DB-OP-02009, PLANT SERVICES ALARM PANEL 9 ANNUNCIATORS and may enter DB-OP-02528, LOSS OF INSTRUMENT AIR, dependent on the magnitude of the pressure drop.

When the EIAC has been started and the plant is stabilized, the Lead Evaluator can cue loss of Vital Bus D1. The bus will trip and lockout on an electrical fault. The crew should respond in accordance with DB-OP-02001, ELECTRICAL DISTRIBUTION ALARM PANEL 1 ANNUNCIATORS, and then implement DB-OP-02521, LOSS OF AC BUS POWER SOURCES. The SRO should request assistance from electrical maintenance and enter TS 3.8.1.1. and TS 3.0.3. Electrical maintenance will report back that a malfunctioning relay caused the problem and that it can be replaced within 30 minutes.

While the crew is performing DB-OP-02521 and after the SRO has declared the TS, the Lead Evaluator can cue initiation of a progressive RCS leak. The crew should respond to indications/alarms and enter DB-OP-2522, SMALL RCS LEAKS. The SRO should direct a MANUAL reactor trip no later than PZR Level ≤100 inches. The leak will become a design basis LOCA when the reactor trip occurs. The crew should enter DB-OP-02000. Coincident with the SFAS actuation, SFAS L3 Output Module will fail requiring the crew to take compensatory actions. Among other actions, the crew will perform the following high level activities: start LPIP #1, open CC1467 - CCW FROM DH CLR 1 VLV, stop HPI Pumps, and execute the steps of DB-OP-02000, Section 10.0.

Op Test No.: 1	Scenario # 5	Event # 6 & 7	Page 3 of 3
Event Description:	Rapidly Progressing RCS Leak Rate; SFAS L3 Output Module Failure (LPIP #1 Fails to Start and CC-1467 Fails to Re-Position)		

Time	Position	Applicant's Actions or Behavior

The Lead Evaluator can terminate the scenario when all high level activities have been completed and the evaluators agree the crew can be properly evaluated.

Facility:	Davis-Besse	Scenario No.: SP	Op Test No.: NRC 2005
Examiners:		Operators:	
Initial Conditions:	• 95% power, MOL		
	• #1 MU Pump tagged OOS		
	• Containment Air Cooler #1 tagged OOS		
	• CAC #3 is aligned for Train 1		
Turnover:	The previous shift returned HP Feedwater Heater #1 to service. Raise power to 100%.		

Event No.	Malf. No.	Event Type*	Event Description
1		N-BOP, SRO R-RO	Raise power to 100%.
2	PZR-10	I-RO, SRO	Controlling PZR Level instrument fails LO
3		C-BOP, SRO TS-SRO	Isolable steam leak in line to AFPT #2
4	CF-03	TS-SRO	N2 leak in a Core Flood Tank
5	CCW-05	M-ALL	Leak in a CCW Header requires a reactor trip
6	VS-01	C-ALL	Rapidly lowering condenser vacuum coincident with reactor trip
7	AFW-01	C-BOP	AFPT #1 trips on overspeed.
8	AFW-02	C-ALL	MDFP trips

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

Op Test No.: 1	Scenario # 5	Event # 5, 6, 7	Page 2 of 2
Event Description:	CCW Header leak, reactor trip, loss of all feedwater		

Time	Position	Applicant's Actions or Behavior

DAVIS-BESSE 2005 NRC EXAM SIMULATOR SPARE SCENARIO GENERAL DESCRIPTION

The crew will take the watch with directions to raise power to 100%.

On cue from the Lead Evaluator, the Pressurizer Level channel failure will be initiated. The crew should respond in accordance with DB-OP-02004, REACTOR COOLANT ALARM PANEL 4 ANNUNCIATORS and then enter DB-OP-02513, PRESSURIZER SYSTEM ABNORMAL OPERATION.

When Pressurizer Level controls have been restored to AUTO, the Lead Evaluator can cue the steam leak on the line to AFPT #2. The leak will be reported as isolable by an AO. The BOP will isolate the leak from the control room. The SRO should enter the correct TS and may request assistance from maintenance.

On cue from the Lead Evaluator, a nitrogen leak will develop in a Core Flood Tank. The crew should respond to alarm 3-2-F (G) in accordance with DB-OP-02003, ECCS ALARM PANEL 3 ANNUNCIATORS. The SRO should enter the correct TS and initiate corrective action. The scenario can proceed when corrective action has been initiated.

When the plant is stable and the AFPT TS entered, the Lead Evaluator can cue the Component Cooling Water header leak. The crew should respond in accordance with DB-OP-02011, HEAT SINK ALARM PANEL 11 ANNUNCIATORS and/or enter DB-OP-02523, COMPONENT COOLING WATER (CC) SYSTEM MALFUNCTIONS. When CCW Surge Tank level cannot be maintained the crew should initiate a reactor trip and stop all Reactor Coolant Pumps.

Condenser pressure will rise rapidly when the reactor is tripped. The crew should enter DB-OP-02000. The loss of vacuum will trip the MFP turbines and AFPT #1 will fail to AUTO start. The MDFP will trip. The BOP operator should start AFPT #1 but it will trip later in the scenario; leaving no running source of feedwater. Among other actions, the crew will perform the following high level activities: establish maximum MU flow from the BWST, perform actions for lack of adequate heat transfer, and establish feed flow from the SUFP.

The Lead Evaluator can terminate the scenario when all high level activities have been completed and the evaluators agree the crew can be properly evaluated.

Facility:	DAVIS – BESSE	Date of Examination:	7/18/2005
Exam Level (circle one)	**RO** / SRO(I)	Operating Test No.:	NRC

Control Room Systems[@] (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)			
	System / JPM Title	Type Code*	Safety Function
a.	Restore cooling to the CRD's in accordance with DB-OP-06910 following an SFAS actuation. (RO ONLY)	N, S	1
b.	Respond to a loss of normal RCS makeup in accordance with DB-OP-02512 (Bank JPM 082).	D, S	2
c.	Emergency close a Core Flood Tank Isolation Valve in accordance with DB-OP-06014 (Bank JPM-089).	D, S	3
d.	Swap operating DH loops with RCS cooling in progress in accordance with DB-OP-06012 (Bank JPM 087).	D, L, S	4P
e.	Trip the turbine generator in accordance with DB-OP-06903.	N, A, S, L	4S
f.	Energize the D2 Bus from Bus D1	N, A, S	6
g.	Monitor and control CTMT conditions using DB-OP-02000, Table 3.	N, A, S	5
h.	Shift from 4 to 2 Circulating Water Pump operation in accordance with DB-OP-06232 (2004 NRC, h).	P, A, L, S	8
In-Plant Systems[@] (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)			
i.	Place the High Pressure Injection alternate minimum recirculation flowpath in service in accordance with Attachment 14 of DB-OP-02000 (2004 NRC, i).	P, R, E	3
j.	Initiate a reactor trip from #2 Low Voltage Switchgear Room in accordance with DB-OP-2000 (Bank JPM 042).	D, A, E	1
k.	Reset the overspeed trip mechanism on the AFPT in accordance with DB-OP-06233 (Bank JPM 075).	D	4S

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

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

a. From a plant tripped condition, the candidate will be directed to restore cooling to the CRD's in accordance with DB-OP-06910, TRIP RECOVERY. This task will be performed by RO applicants only
New JPM K/A: 001 A4.01 (3.1/2.9).

b. From a Mode 1 condition, MU 32, Pressurizer Level Control valve, will fail closed. The candidate will respond in accordance with DB-OP-02512, LOSS OF RCS MAKEUP.
Bank JPM 082 K/A: 004 A2.07 (3.4/3.7).

c. From a Mode 1 condition, the candidate will be directed to emergency close a Core Flood Tank Isolation Valve in accordance with DB-OP-06014, CORE FLOOD SYSTEM, Section 5.2, due to excessive in-leakage.
Bank JPM-089 K/A: 006 A4.02 (4.0/3.8).

d. From a Mode 5 condition, the candidate will be directed to shift operating DH Pumps with RCS cooling in progress in accordance with DB-OP-06012, DECAY HEAT AND LOW PRESSURE INJECTION SYSTEM.
Bank JPM 087 K/A: 005 A4.01 (3.6/3.4).

e. From a Mode 1 condition, the candidate will be required to trip the Main Turbine Generator in accordance with DB-OP-06903. The alternate path for this task is to open switchyard breakers when a Generator Output breaker fails to open
New JPM K/A: 045 A4.02 (2.7/2.6).

f. From a loss of off-site power condition, the candidate will be directed to implement the actions for Specific Rule 6 of DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE. A loss of AFW has resulted in requirement for Feed and Bleed cooling. The alternate path of this task is that diesel loading will be too high to start the MDFW pump once the bus is energized, requiring the candidate to use a separate attachment to determine which loads must be secured prior to starting the MDFW pump.
New JPM. KA: APE 056 AA2.14 (4.4/4.6).

g. From post-trip conditions, the applicant will be required to monitor and control containment atmospheric conditions in accordance with DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE, Table 3. The Containment Air Cooling system alignment does not reflect the required mode of operation, requiring manual operation to realign. The Hydrogen Dilution Blowers must also be placed in service.
K/A: 022 A4.01 (3.6/3.6).

h. From a Mode 1 condition, shift from 4 to 2 Circulating Water (CW) Pump operation in accordance with DB-OP-06232, CIRCULATING WATER SYSTEM AND COOLING TOWER OPERATION.

Randomly selected repeat from facility 2004 NRC Examination (JPM h). One CW Pump fails to stop, requiring the candidate to implement alternate action.
K/A: 075 A2.02 (2.5/2.7).

i. From a plant tripped condition, the candidate will be directed to perform DB-OP-02000, ATTACHMENT 14 - ESTABLISHING HIGH PRESSURE INJECTION ALTERNATE MINIMUM RECIRCULATION FLOWPATH. Randomly selected repeat from facility 2004 NRC Examination (JPM i).
K/A: System 006, Generic 2.1.30 (3.9/3.4).

j. From an ATWT condition, the candidate will be directed to initiate a reactor trip via the local actions of DB-OP-02000. The reactor trip breakers will fail to open, requiring the candidate to implement alternate action.
Bank JPM 042. K/A: System 001, Generic 2.1.30 (3.9/3.4).

k. From a plant tripped condition, the candidate will be directed to reset the overspeed trip mechanism on AFPT 1 in accordance with DB-OP-06233, AUXILIARY FEEDWATER SYSTEM, Section 5.11.
Bank JPM 075 K/A: System 061, Generic 2.1.30 (3.9/3.4).

Facility:	DAVIS – BESSE	Date of Examination:	7/18/2005
Exam Level (circle one)	RO / **SRO(I)**	Operating Test No.:	NRC

Control Room Systems[@] (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)			
	System / JPM Title	Type Code*	Safety Function
a.	(RO ONLY)		
b.	Respond to a loss of normal RCS makeup in accordance with DB-OP-02512 (Bank JPM 082).	D, S	2
c.	Emergency close a Core Flood Tank Isolation Valve in accordance with DB-OP-06014 (Bank JPM-089).	D, S	3
d.	Swap operating DH loops with RCS cooling in progress in accordance with DB-OP-06012 (Bank JPM 087).	D, L, S	4P
e.	Trip the turbine generator in accordance with DB-OP-06903.	N, A, S, L	4S
f.	Energize the D2 Bus from Bus D1	N, A, S	6
g.	Monitor and control CTMT conditions using DB-OP-02000, Table 3.	N, A, S	5
h.	Shift from 4 to 2 Circulating Water Pump operation in accordance with DB-OP-06232 (2004 NRC, h).	P, A, L, S	8
In-Plant Systems[@] (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)			
i.	Place the High Pressure Injection alternate minimum recirculation flowpath in service in accordance with Attachment 14 of DB-OP-02000 (2004 NRC, i).	P, R, E	3
j.	Initiate a reactor trip from #2 Low Voltage Switchgear Room in accordance with DB-OP-2000 (Bank JPM 042).	D, A, E	1
k.	Reset the overspeed trip mechanism on the AFPT in accordance with DB-OP-06233 (Bank JPM 075).	D	4S

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

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

a. RO only

b. From a Mode 1 condition, MU 32, Pressurizer Level Control valve, will fail closed. The candidate will respond in accordance with DB-OP-02512, LOSS OF RCS MAKEUP.
Bank JPM 082 K/A: 004 A2.07 (3.4/3.7).

c. From a Mode 1 condition, the candidate will be directed to emergency close a Core Flood Tank Isolation Valve in accordance with DB-OP-06014, CORE FLOOD SYSTEM, Section 5.2, due to excessive in-leakage.
Bank JPM-089 K/A: 006 A4.02 (4.0/3.8).

d. From a Mode 5 condition, the candidate will be directed to shift operating DH Pumps with RCS cooling in progress in accordance with DB-OP-06012, DECAY HEAT AND LOW PRESSURE INJECTION SYSTEM.
Bank JPM 087 K/A: 005 A4.01 (3.6/3.4).

e. From a Mode 1 condition, the candidate will be required to trip the Main Turbine Generator in accordance with DB-OP-06903. The alternate path for this task is to open switchyard breakers when a Generator Output breaker fails to open
New JPM K/A: 045 A4.02 (2.7/2.6).

f. From a loss of off-site power condition, the candidate will be directed to implement the actions for Specific Rule 6 of DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE. A loss of AFW has resulted in requirement for Feed and Bleed cooling. The alternate path of this task is that diesel loading will be too high to start the MDFW pump once the bus is energized, requiring the candidate to use a separate attachment to determine which loads must be secured prior to starting the MDFW pump.
New JPM. KA: APE 056 AA2.14 (4.4/4.6).

g. From post-trip conditions, the applicant will be required to monitor and control containment atmospheric conditions in accordance with DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE, Table 3. The Containment Air Cooling system alignment does not reflect the required mode of operation, requiring manual operation to realign. The Hydrogen Dilution Blowers must also be placed in service.
K/A: 022 A4.01 (3.6/3.6).

h. From a Mode 1 condition, shift from 4 to 2 Circulating Water (CW) Pump operation in accordance with DB-OP-06232, CIRCULATING WATER SYSTEM AND COOLING TOWER OPERATION. Randomly selected repeat from facility 2004 NRC Examination (JPM h). One CW Pump fails to stop, requiring the candidate to implement alternate action.
K/A: 075 A2.02 (2.5/2.7).

i. From a plant tripped condition, the candidate will be directed to perform DB-OP-02000, ATTACHMENT 14 - ESTABLISHING HIGH PRESSURE INJECTION ALTERNATE MINIMUM RECIRCULATION FLOWPATH. Randomly selected repeat from facility 2004 NRC Examination (JPM i).
K/A: System 006, Generic 2.1.30 (3.9/3.4).

j. From an ATWT condition, the candidate will be directed to initiate a reactor trip via the local actions of DB-OP-02000. The reactor trip breakers will fail to open, requiring the candidate to implement alternate action.
Bank JPM 042. K/A: System 001, Generic 2.1.30 (3.9/3.4).

k. From a plant tripped condition, the candidate will be directed to reset the overspeed trip mechanism on AFPT 1 in accordance with DB-OP-06233, AUXILIARY FEEDWATER SYSTEM, Section 5.11.
Bank JPM 075 K/A: System 061, Generic 2.1.30 (3.9/3.4).

Facility: Davis Besse Date of Exam: 7/18/2005

Tier	Group	RO K/A Category Points												SRO-Only Points		
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total
1. Emergency & Abnormal Plant Evolutions	1	3	2	2				5	4			2	18	3	3	6
	2	1	1	3				1	2			1	9	2	2	4
	Tier Totals	4	3	5				6	6			3	27	5	5	10
2. Plant Systems	1	5	3	2	4	2	1	3	3	3	1	1	28	2	3	5
	2	1	1	1	0	1	1	1	1	1	1	1	10	2	1	3
	Tier Totals	6	4	3	4	3	2	4	4	4	2	2	38	4	4	8
3. Generic Knowledge and Abilities Categories		1			2			3			4		10	1	2	3	4	7
		3			2			2			3			2	2	1	2	

Note:	1.	Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
	2.	The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
	3.	Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to ES-401, Attachment 2, for guidance regarding elimination of inappropriate K/A statements.
	4.	Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
	5.	Absent a plant specific priority, only those KAs having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
	6.	Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
	7.*	The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.
	8.	On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above: if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-Only exam, enter it on the left side of column A2 for Tier 2, Group 2. Use duplicate pages for RO and SRO-only exams.
	9.	For Tier 3, select topics from Section 2 of the K/A Catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10CFR55.43

Davis Besse
Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
015 / 17 / RCP Malfunctions / 4	X						2.2.25	Equipment Control Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	76
029 / ATWS / 1						X	EA2.06	Ability to determine or interpret the following as they apply to a ATWS: Main turbine trip switch position indication	3.9	77
038 / Steam Gen. Tube Rupture / 3	X						2.1.14	Conduct of Operations: Knowledge of system status criteria which require the notification of plant personnel.	3.3	78
057 / Loss of Vital AC Inst. Bus / 6	X						2.4.4	Emergency Procedures / Plan Ability to recognize abnormal indications for system operating parameters which are entry level conditions for emergency and abnormal operating procedures	4.3	79
058 / Loss of DC Power / 6						X	AA2 02	Ability to determine and interpret the following as they apply to the Loss of DC Power: 125V dc bus voltage, low/critical low, alarm	3.6	80
062 / Loss of Nuclear Svc. Water / 4						X	AA2.01	Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: Location of a leak in the SWS	3.5	81
008 / Pressurizer Vapor Space Accident / 3		X					AK1.01	Knowledge of the operational implications of the following concepts as they apply to a Pressurizer Vapor Space Accident: Thermodynamics and flow characteristics of open or leaking valves	3.2	39
009 / Small Break LOCA / 3	X						2.4.50	Emergency Procedures / Plan Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	3.3	40
015 / 17 / RCP Malfunctions / 4					X		AA1.23	Ability to operate and / or monitor the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): RCP vibration	3.1	41
022 / Loss of Rx Coolant Makeup / 2	X						2.1.30	Conduct of Operations: Ability to locate and operate components, including local controls.	3.9	42
025 / Loss of RHR System / 4			X				AK2.02	Knowledge of the interrelations between the Loss of Residual Heat Removal System and the following: LPI or Decay Heat Removal/RHR pumps	3.2	43
026 / Loss of Component Cooling Water / 8						X	AA2.06	Ability to determine and interpret the following as they apply to loss of CCW: The length of time after the loss of CCW flow to a component before that component may be damaged	2.8	44
027 / Pressurizer Pressure Control System Malfunction / 3				X			AK3.04	Knowledge of the reasons for the following responses as they apply to the Pressurizer Pressure Control Malfunctions: Why, if pressurizer level is lost and then restored, that pressure recovers much more slowly	2.8	45

Davis Besse
Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
029 / ATWS / 1						X	EA2.01	Ability to determine and interpret the following as they apply to an ATWS: Reactor nuclear instrumentation	4.4	46
038 / Steam Gen. Tube Rupture / 3		X					EK1.01	Knowledge of the operational implications of the following concepts as they apply to the SGTR: Use of steam tables	3.1	47
040 / Steam Line Rupture - Excessive Heat Transfer / 4					X		AA1.03	Ability to operate and / or monitor the following as they apply to the Steam Line Rupture: Isolation of one steam line from header	4.3	48
054 / Loss of Main Feedwater / 4						X	AA2.06	Ability to determine and interpret the following as they apply to the Loss of Main Feedwater (MFW): AFW adjustments needed to maintain proper T-ave. and S/G level	4.0	49
055 / Station Blackout / 6		X					EK1.02	Knowledge of the operational implications of the following concepts as they apply to the Station Blackout : Natural circulation cooling	4.1	50
056 / Loss of Off-site Power / 6						X	AA2.54	Ability to determine and interpret the following as they apply to the Loss of Offsite Power: Breaker position (remote and local)	2.9	51
057 / Loss of Vital AC Inst. Bus / 6					X		AA1.04	Ability to operate and / or monitor the following as they apply to the Loss of Vital AC Instrument Bus: RWST and VCT valves	3.5	52
062 / Loss of Nuclear Svc. Water / 4					X		AA1.04	Ability to operate and / or monitor the following as they apply to the Loss of Nuclear Service Water: CRDM high-temperature alarm system	2.7	53
E04 / Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4					X		EA1.1	Ability to operate and / or monitor the following as they apply to the (Inadequate Heat Transfer) Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	4.4	54
E05 / Steam Line Rupture - Excessive Heat Transfer / 4			X				EK2.2	Knowledge of the interrelations between the (Excessive Heat Transfer) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, and decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	4.2	55
E10 / Reactor Trip - Stabilization - Recovery / 1				X			EK3.3	Knowledge of the reasons for the following responses as they apply to the (Post-Trip Stabilization) Manipulation of controls required to obtain desired operating results during abnormal and emergency situations.	4.0	56
K/A Category Point Totals:	2/3	3	2	2	5	4/3	Group Point Total:			18/6

Davis Besse
Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
033 / Loss of Intermediate Range NI / 7						X	AA2.12	Ability to determine and interpret the following as they apply to the Loss of Intermediate Range Nuclear Instrumentation: Maximum allowable channel disagreement	3.1	82
051 / Loss of Condenser Vacuum / 4	X						2.1.33	Conduct of Operations: Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	4.0	83
E13 / EOP Rules	X						2.4.6	Emergency Procedures / Plan Knowledge symptom based EOP mitigation strategies.	4.0	84
A01 / Plant Runback / 1						X	AA2.1	Ability to determine and interpret the following as they apply to the (Plant Runback) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	3.7	85
051 / Loss of Condenser Vacuum / 4						X	AA2.02	Ability to determine and interpret the following as they apply to the Loss of Condenser Vacuum: Conditions requiring reactor and/or turbine trip	3.9	57
059 / Accidental Liquid RadWaste Rel. / 9		X					AK1.01	Knowledge of the operational implications of the following concepts as they apply to Accidental Liquid Radwaste Release: Types of radiation, their units of intensity and the location of the sources of radiation in a nuclear power plant	2.7	58
060 / Accidental Gaseous RadWaste Rel. / 9	X						2.4.31	Emergency Procedures/Plan: Knowledge of annunciators, alarms and indications, and use of the response instructions	3.3	59
068 / Control Room Evac. / 8			X				AK2.07	Knowledge of the interrelations between the Control Room Evacuation and the following: ED/G	3.3	60
076 / High Reactor Coolant Activity / 9				X			AK3.06	Knowledge of the reasons for the following responses as they apply to the High Reactor Coolant Activity : Actions contained in EOP for high reactor coolant activity	3.2	61
A02 / Loss of NNI-X/Y / 7				X			AK3.4	Knowledge of the reasons for the following responses as they apply to the (Loss of NNI-X) RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated.	3.7	62
A07 / Flooding / 8						X	AA2.2	Ability to determine and interpret the following as they apply to the (Flooding) Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	3.3	63

Davis Besse
Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
E13 / EOP Rules					X		EA1.3	Ability to operate and / or monitor the following as they apply to the (EOP Rules) Desired operating results during abnormal and emergency situations.	3.4	64
E14 / EOP Enclosures				X			EK3.2	Knowledge of the reasons for the following responses as they apply to the (EOP Enclosures) Normal, abnormal and emergency operating procedures associated with (EOP Enclosures).	3.0	65
K/A Category Point Total:	1/2	1	1	3	1	2/2	Group Point Total:			**9/4**

Davis Besse
Written Examination Outline
Plant Systems – Tier 2 Group 1

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
003 Reactor Coolant Pump									X			A2.05	Ability to (a) predict the impacts of the following malfunctions or operations on the RCPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Effects of VCT pressure on RCP seal leakoff flows	2.8	86
006 Emergency Core Cooling	X											2.4.4	Emergency Procedures / Plan Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.3	87
039 Main and Reheat Steam									X			A2.04	Ability to (a) predict the impacts of the following mal-functions or operations on the MRSS; and (b) based on predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Malfunctioning steam dump	3.7	91
059 Main Feedwater	X											2.2.22	Equipment Control Knowledge of limiting conditions for operations and safety limits.	4.1	89
073 Process Radiation Monitoring	X											2.1.33	Conduct of Operations: Ability to recognize indications for system operating parameters which are entry level conditions for technical specifications	4.0	90
003 Reactor Coolant Pump						X						K5.05	Knowledge of the operational implications of the following concepts as they apply to the RCPS: The dependency of RCS flow rates upon the number of operating RCPs	3.8	1
003 Reactor Coolant Pump		X										K1.13	Knowledge of the physical connections and/or cause-effect relationships between the RCPS and the following systems: RCP bearing lift oil pump	2.5	2
004 Chemical and Volume Control										X		A3.18	Ability to monitor automatic operation of the CVCS, including: Interpretation of letdown orifice isolation valve position indicators	2.8	3
005 Residual Heat Removal					X							K4.03	Knowledge of RHRS design feature(s) and/or interlock(s) which provide or the following: RHR heat exchanger bypass flow control	2.9	4
006 Emergency Core Cooling								X				A1.16	Ability to predict and/or monitor changes in parameters RCS temperature, including superheat, saturation, and subcooled	4.1	5
006 Emergency Core Cooling		X										K1.02	Knowledge of the physical connections and/or cause-effect relationships between the ECCS and the following systems: ESFAS	4.3	6

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
007 Pressurizer Relief/Quench Tank								X				A1.02	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including: Maintaining quench tank pressure	2.7	7
008 Component Cooling Water										X		A3.05	Ability to monitor automatic operation of the CCWS, including: Control of the electrically operated, automatic isolation valves in the CCWS	3.0	8
010 Pressurizer Pressure Control										X		A3.01	Ability to monitor automatic operation of the PZR PCS, including: PRT temperature and pressure during PORV testing	3.0	9
012 Reactor Protection							X					K6.11	Knowledge of the effect that a loss or malfunction of the following will have on the RPS: Trip setpoint calculators	2.9	10
013 Engineered Safety Features Actuation			X									K2.01	Knowledge of bus power supplies to the following: ESFAS/safeguards equipment control	3.6	11
022 Containment Cooling								X				A1.01	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CCS controls including: Containment temperature	3.6	12
022 Containment Cooling									X			A2.04	Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of service water	2.9	13
026 Containment Spray					X							K4.07	Knowledge of CSS design feature(s) and/or interlock(s) which provide for the following: Adequate level in containment sump for suction (interlock)	3.8	14
026 Containment Spray			X									K2.02	Knowledge of bus power supplies to the following: MOVs	2.7	15
039 Main and Reheat Steam						X						K5.08	Knowledge of the operational implications of the following concepts as they apply to the MRSS: Effect of steam removal on reactivity	3.6	16
059 Main Feedwater	X											2.1.27	Conduct of Operations: Knowledge of system purpose and or function.	2.8	17
059 Main Feedwater									X			A2.07	Ability to (a) predict the impacts of the following malfunctions or operations on the MFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Tripping of MFW pump turbine	3.0	18

Davis Besse
Written Examination Outline
Plant Systems – Tier 2 Group 1

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
061 Auxillary/Emergency Feedwater				X								K3.01	Knowledge of the effect that a loss or malfunction of the AFW will have on the following: RCS	4.4	19
062 AC Electrical Distribution					X							K4.03	Knowledge of ac distribution system design feature(s) and/or interlock(s) which provide for the following: Interlocks between automatic bus transfer and breakers	2.8	20
062 AC Electrical Distribution									X			A2.11	Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Aligning standby equipment with correct emergency power source (D/G)	3.7	21
063 DC Electrical Distribution		X										K1.02	Knowledge of the physical connections and/or cause-effect relationships between the dc electrical system and the following systems: AC electrical system	2.7	22
064 Emergency Diesel Generator				X								K3.03	Knowledge of the effect that a loss or malfunction of the ED/G system will have on the following: ED/G (manual loads)	3.6	23
073 Process Radiation Monitoring					X							K4.01	Knowledge of PRM system design feature(s) and/or interlocks which provide for the following: Release termination when radiation exceeds setpoint	4.0	24
076 Service Water											X	A4.04	Ability manually operate and/or monitor in the control room: Emergency Heat Loads	3.5	25
076 Service Water		X										K1.01	Knowledge of the physical connections and/or cause- effect relationships between the SWS and the following systems: CCW system	3.4	26
078 Instrument Air			X									K2.02	Knowledge of bus power supplies to the following Emergency air compressor	3.3	27
103 Containment		X										K1.03	Knowledge of the physical connections and/or cause-effect relationships between the containment system and the following systems: Shield building vent system	3.1	28
K/A Category Point Totals:	1/3	5	3	2	4	2	1	3	3/2	3	1	Group Point Total:			**28/5**

Davis Besse
Written Examination Outline
Plant Systems – Tier 2 Group 2

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
034 Fuel Handling Equipment									X			A2.01	Ability to (a) predict the impacts of the following mal-functions or operations on the FHS; and (b) based on predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Dropped Fuel Assembly	3.6	88
072 Area Radiation Monitoring	X											2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.8	92
086 Fire Protection									X			A2.04	Ability to (a) predict the impacts of the following malfunctions or operations on the Fire Protection System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure to actuate the FPS when required, resulting in fire damage	3.9	93
001 Control Rod Drive				X								K3.01	Knowledge of the effect that a loss or malfunction of the CRDS will have on the following: CVCS	2.9	29
002 Reactor Coolant										X		A3.01	Ability to monitor automatic operation of the RCS, including: Reactor Coolant Leak Detection System	3.7	30
011 Pressurizer Level Control									X			A2.08	Ability to (a) predict the impacts of the following malfunctions or operations on the PZR LCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of Loss of level compensation	2.6	31
015 Nuclear Instrumentation			X									K2.01	Knowledge of bus power supplies to the following: NIS channels, components, and interconnections	3.3	33
016 Non-nuclear Instrumentation		X										K1.01	Knowledge of the physical connections and/or cause-effect relationships between the NNIS and the following systems: RCS	3.4	32
035 Steam Generator							X					K6.03	Knowledge of the effect of a loss or malfunction on the following will have on the S/GS: S/G level detector	2.6	35
041 Steam Dump								X				A1.02	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SDS controls, including: Steam Pressure.	3.1	37
045 Main Turbine Generator											X	A4.01	Ability to manually operate and/or monitor in the control room: Turbine valve indicators (throttle, governor, control, stop, intercept), alarms, and annunciators	3.1	36

Davis Besse
Written Examination Outline
Plant Systems – Tier 2 Group 2

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
079 Station Air	X											2.1.23	Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.	3.9	38
086 Fire Protection						X						K5.03	Knowledge of the operational implications of the following concepts as they apply to the Fire Protection System: Effect of water spray on electrical components	3.1	34
K/A Category Point Totals:	1/1	1	1	1	0	1	1	1	1/2	1	1	Group Point Total:			**10/3**

Facility:	Davis Besse	Date of Exam:	7/18/2005

Category	K/A #	Topic	RO		SRO-Only	
			IR	Q#	IR	Q#
1. Conduct of Operations	2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.			4.0	94
	2.1.4	Knowledge of shift staffing requirements.			3.4	95
	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.	3.9	66		
	2.1.24	Ability to obtain and interpret station electrical and mechanical drawings.	2.8	67		
	2.1.21	Ability to obtain and verify controlled procedure copy.	3.1	68		
	Subtotal			3		2
2. Equipment Control	2.2.20	Knowledge of the process for managing troubleshooting activities.			3.3	96
	2.2.25	Knowledge of basis in technical specifications limiting conditions for operation and safety limits			3.7	97
	2.2.26	Knowledge of refueling administrative requirements.	2.5	69		
	2.2.22	Knowledge of limiting conditions for operations and safety limits.	3.4	70		
	Subtotal			2		2
3. Radiation Control	2.3.1 .	Knowledge of 10 CFR: 20 and related facility radiation control requirements			3.0	98
	2.3.11	Ability to control radiation releases.	2.7	71		
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	72		
	Subtotal			2		1
4. Emergency Procedures / Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps.			4.6	99
	2.4.33	Knowledge of the process used to track inoperable alarms.			2.8	100
	2.4.49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	73		
	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions including: 1 Reactivity control 2. Core cooling and heat removal 3. Reactor coolant system integrity 4. Containment conditions 5. Radioactivity release control.	3.7	74		
	2.4.19	Knowledge of EOP layout, symbols, and icons.	2.7	75		
	Subtotal			3		2
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1	057 G2.4.30	Events related to this APE would not require reports to outside agencies
1/1	062 AA2.03	Procedures do not provide for alignments as specified by the KA
1/1	026 AA1.06	Components of this system do not have flow control
1/1	027 AK3.01	Action is not performed at Davis Besse
1/1	038 EK1.04	No reflux boiling exists during a SGTR for a OTSG
1/1	056 AA2.86	Cannot develop a psychometrically sound test item on interpretation of a meter scale during a LOOP
1/2	059 G2.4.6	No symptom based strategy for the event selected
1/2	060 AK3.01	Implementation of E-Plan beyond scope of RO position
2/1	073 G2.4.49	System does not require immediate operation of any controls
2/1	012 K2.01	Over-sampled power supplies for RPS/ESFAS. Double jeopardy.
2/1	022 A1.03	No indication of humidity in control room
2/1	076 K2.04	Facility does not have Reactor Building closed cooling water
2/1	076 K1.21	Facility does not have Auxiliary Backup SWS
2/2	001 K6.11	Removed due to over-sample of K6 for Tier 2 Group 2
2/2	002 A3.02	Facility does not have an RCS containment sound monitoring system
2/2	027 K1.01	Removed due to over-sample of K1 for Tier 2 Group 2
2/2	029 A4.04	Removed due to over-sample of A4 for Tier 2 Group 2
2/2	075 A2.01	No guidance available for event. Intake structure only used occasionally for Cooling Tower makeup at facility
2/2	039 A2.04	Item was duplicated by mistake from T2 G1 selection. Randomly generated T2 G2 034 A2.01 to replace
3	2.2.15	Item would have been duplicate of information from question 67. Randomly generated 2.2.25 to replace
2/2	011 A2.05	Facility system does not operate in a way that a question could be written to this KA. Randomly generated 011 A2.08 to replace
2/2	041 A1.01	Facility has no low low Tave setpoint. Randomly generated 041 A1.02
2 / 1	039 K5.05	Replaced because there was no reference supporting RO level knowledge for topic