Administrative Documents

MCGUIRE JUNE 2003 EXAM
50-369/2003-301 AND
50-370/2003-301

JUNE 16 - 30, 2003

✓1.	Exam Preparation Checklist	ES-201-1
✓2.	Exam Outline Quality Checklist	ES-201-2
✓3.	Exam Security Agreement	ES-201-3
✓4.	Administrative Topics Outline (Final)	ES-301-1
✓5.	Control Room Systems and Facility Walk-through Test Outline (Final)	ES-301-2
✓6.	Operating Test Quality Check Sheet	ES-301-3
✓7.	Simulator Scenario Quality Check Sheet	ES-301-4
✓8.	Transient and Event Checklist	ES-301-5
✓9.	Competencies Checklist	ES-301-~~6~~ 6
✓10.	Written Exam Quality Check Sheet	ES-401-~~7~~ 6
✓11.	Written Exam Review Worksheet	ES-401-9
✓12.	Written Exam Grading Quality Checklist	ES-403-1
☐13.	Post-Exam Check Sheet	ES-501-1

Facility: McGuire Date of Examination: Weeks of June 16 and 23, 2003

Examinations Developed by: (Facility) / (NRC) (circle one)

Target Date*	Task Description / Reference	Chief Examiner's Initials
-180	1. Examination administration date confirmed (C.1.a; C.2.a & b)	RSB
-120	2. NRC examiners and facility contact assigned (C.1.d; C.2.e)	RSB
-120	3. Facility contact briefed on security & other requirements (C.2.c)	RSB
-120	4. Corporate notification letter sent (C.2.d)	RSB
[-90]	[5. Reference material due (C.1.e; C.3.c)]	RSB
-75	6. Integrated examination outline(s) due (C.1.e & f; C.3.d)	RSB
-70	7. Examination outline(s) reviewed by NRC and feedback provided to facility licensee (C.2.h; C.3.e)	RSB
-45	8. Proposed examinations, supporting documentation, and reference materials due (C.1.e, f, g & h; C.3.d)	RSB
-30	9. Preliminary license applications due (C.1.l; C.2.g; ES-202)	RSB
-14	10. Final license applications due and assignment sheet prepared (C.1.l; C.2.g; ES-202)	RSB
-14	11. Examination approved by NRC supervisor for facility licensee review (C.2.h; C.3.f)	RSB
-14	12. Examinations reviewed with facility licensee (C.1.j; C.2.f & h; C.3.g)	RSB
-7	13. Written examinations and operating tests approved by NRC supervisor (C.2.i; C.3.h)	RSB
-7	14. Final applications reviewed; assignment sheet updated; waiver letters sent (C.2.g, ES-204)	RSB
-7	15. Proctoring/written exam administration guidelines reviewed with facility licensee and authorization granted to give written exams (if applicable) (C.3.k)	RSB
-7	16. Approved scenarios, job performance measures, and questions distributed to NRC examiners (C.3.i)	RSB

* Target dates are keyed to the examination date identified in the corporate notification letter. They are for planning purposes and may be adjusted on a case-by-case basis in coordination with the facility licensee.

[ ] Applies only to examinations prepared by the NRC.

Facility: McGuire Date of Examination: 6-19-03

Item	Task Description	Initials a	b*	c#
1. WRITTEN	a. Verify that the outline(s) fit(s) the appropriate model per ES-401.			
	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.			
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.			
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.			
2. SIM	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.			
	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~~ on subsequent days.			
	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.			
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.			
	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%~~4 - 6 (2 - 3 for SRO-U) 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.			
	c. Verify that the required administrative topics are covered, ~~with emphasis on performance-based activities.~~			
	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~~ subsequent days.			
4. GENERIC	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam section(s).			
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.			
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.			
	d. Check for duplication and overlap among exam sections.			
	e. Check the entire exam for balance of coverage.			
	f. Assess whether the exam fits the appropriate job level (RO or SRO).			

	Printed Name / Signature	Date
a. Author	CHARLES SAWYER / Charles Sawyer	4-17-03
b. Facility Reviewer (*)	Carroll Dean Cornwell / CD Cornwell	4-21-03
c. NRC Chief Examiner (#)	RICHARD S. BALDWIN / Richard S. Baldwin	6/12/03
d. NRC Supervisor	MICHAEL E. ERNSTES / Michael E. Ernstes	6/12/03

Note: * Not applicable for NRC-developed examinations.
Independent NRC reviewer initial items in Column "c;" chief examiner concurrence required.

1. Pre-Examination

June 16 AND June 23, 2003

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of _____ as of the date of my signature. I agree that I will not knowingly divulge any information about these examinations to any persons who have not been authorized by the NRC chief examiner. I understand that I am not to instruct, evaluate, or provide performance feedback to those applicants scheduled to be administered these licensing examinations from this date until completion of examination administration, except as specifically noted below and authorized by the NRC. Furthermore, I am aware of the physical security measures and requirements (as documented in the facility licensee's procedures) and understand that violation of the conditions of this agreement may result in cancellation of the examinations and/or an enforcement action against me or the facility licensee. I will immediately report to facility management or the NRC chief examiner any indications or suggestions that examination security may have been compromised.

2. Post-Examination

To the best of my knowledge, I did not divulge to any unauthorized persons any information concerning the NRC licensing examinations administered during the week(s) of June 16 AND June 23. From the date that I entered into this security agreement until the completion of examination administration, I did not instruct, evaluate, or provide performance feedback to those applicants who were administered these licensing examinations, except as specifically noted below and authorized by the NRC.

	PRINTED NAME	JOB TITLE / RESPONSIBILITY	SIGNATURE (1)	DATE	SIGNATURE (2)	DATE	NOTE
1.	CHARLES W. SAWYER SR	INSTRUCTOR / LEAD EXAM DEVELOPER		2-25-03		7-1-03	
2.	Rob Billings	Instructor / Exam Developer		3-4-03		7-1-03	
3.	STEVEN A. HELMS	INSTRUCTOR / EXAM DEV		3-4-03		7-7-03	
4.	Carroll Dean Cornwell	SRO / Exam Dev		3-5-03		8/5/03	
5.	SUTHASH KUMAR	[illegible] / SIM		3-17-03		7-1-03	
6.	DENNIS TAYLOR	[illegible] / SPT		3-17-03		7-7-03	
7.	Terry TESSNEAR	[illegible] / SimTest		3-18-03		7-1-03	
8.	Wiley Killette	INST [illegible] / Exam Dev		3/19/03		7/1/03	
9.	Catherine Swiatek	SR[illegible] / Developer		3-26-03		7-17-03	
10.	EDDIE L. ROBERTS	[illegible] / OPS TRNG.		4/8/03		7.1.03	
11.	Robert M Poole	RO		4-14-03		7/8/03	
12.	DENNIS E MOORE	SRO		4-14-03		7-8-03	
13.	Charles A. Yoder	SRO		4-16-03		7-29-03	
14.	Reza Bi[illegible]	SRO - STA		4-16-03		7/29/03	
15.	DAVID O[illegible]	RO		4/16/03		7/29/03	

NOTES:

1. Pre-Examination

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of _____ as of the date of my signature. I agree that I will not knowingly divulge any information about these examinations to any persons who have not been authorized by the NRC chief examiner. I understand that I am not to instruct, evaluate, or provide performance feedback to those applicants scheduled to be administered these licensing examinations from this date until completion of examination administration, except as specifically noted below and authorized by the NRC. Furthermore, I am aware of the physical security measures and requirements (as documented in the facility licensee's procedures) and understand that violation of the conditions of this agreement may result in cancellation of the examinations and/or an enforcement action against me or the facility licensee. I will immediately report to facility management or the NRC chief examiner any indications or suggestions that examination security may have been compromised.

2. Post-Examination

To the best of my knowledge, I did not divulge to any unauthorized persons any information concerning the NRC licensing examinations administered during the week(s) of _____. From the date that I entered into this security agreement until the completion of examination administration, I did not instruct, evaluate, or provide performance feedback to those applicants who were administered these licensing examinations, except as specifically noted below and authorized by the NRC.

	PRINTED NAME	JOB TITLE / RESPONSIBILITY	SIGNATURE (1)	DATE	SIGNATURE (2)	DATE	NOTE
1.	Timothy Allen White	NCO		4/17/03		7/17/03	
2.	Wesley Hill	SRO		4/17/03		7/22/03	
1 SPM ONLY 3.	CLEMENTE RIVERA JR.	NLO		5/30/03		8/12/03	
1 JPM ONLY 4.	Charles E Thomas	NLO		5-30-03		7-8-03	
5.	Charles E. ELAM	Prof		6/9/03		7/7/03	
6.	W. R. BAKER	Prof		6/9/03		7/11/03	
7.	Norma Cherry	[illegible]		6-16-03		7-1-03	
8.	DONALD R GRENTON	[illegible] MANAGER		6/17/03		07/21/03	
9.	Jerry W Rumfelt	OS		6/17/03		7/1/03	
10.	John H. Sadler	[illegible]		6/24/03		7/8/03	
11.	William M Mulkey	OPS [illegible]		6/24/03		7/1/03	
12.							
13.							
14.							
15.							

NOTES:

Facility: McGuire Date of Examination: Weeks of June 16 and 23, 2003
Examination Level (circle one): RO / **SRO** Operating Test Number: _____

Administrative Topic ~~/Subject Description~~ (see Note)	Describe activity to be performed ~~method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions~~
~~A.1.a~~ Conduct of Operations	Evaluate Overtime Eligibility (Modified)
Conduct of Operations	Calculate ECP with an additional ECB calculation
~~A.1.b~~ Equipment Control	Evaluate a Work Order for Clearance to do Work. (New)
~~A.3~~ Radiation Control	Evaluate Liquid Waste Release with Fault (New)
~~A.4~~ Emergency Plan	Evaluate Condition for PARS

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.

Facility: McGuire Date of Examination: Weeks of June 16 and 23, 2003
Examination Level (circle one): **RO** / SRO Operating Test Number: _____

Administrative Topic ~~/Subject Description~~ (see Note)	Describe activity to be performed ~~method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions~~
A.1.a Conduct of Operations	Calculate QPTR with an Inoperable Power Range Instrument and Make Technical Specification Evaluation
A.1.b Conduct of Operations	Calculate ECP
~~A.2~~ Equipment Control	Identify Boundaries for Tagout (New)
~~A.3~~ Radiation Control	Utilizing a Survey Map, Calculate the maximum permissible Stay Time with the Alert limit of the Duke Power Basic Administrative limits.
~~A.4~~ Emergency Plan	

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.

Facility: McGuire	Date of examination:
Examination Level (circle one): RO / SRO	Operating Test :_____

Control Room Systems (8 for RO; 7 for SRO-I; 2 o3 for SRO-U		
System / JPM Title	Type Codes*	Safety Function
a. Respond to a Leak on RHR While in Mid-loop **(SROU)**	D,S,L	4p
b. Calculate Boric Acid Pot and Perform Manual Makeup	D,A,S	1
c. Synchronize Main Generator (New Voltage Regulator) **(SROU)**	N,S,A,L	4s
d. Align for Cold Leg Recirculation	D,A	2
e. Isolate Stuck Open PORV (Immediate Action JPM)	D,A	3
f. Respond to a Failure of Power Range N-42	D,A	7
g. RN Alignment after a Loss of AC Power on Unit 2 **(SROU)**	D,C	8
h. Start Up Unit 2 Lower Containment Ventilation Systems	D,C	5
In-Plant Systems (3 for RO, 3 for SRO-I; 3 or 2 for SRO-U		
a. Establish Reactor Coolant Pump Seal Injection from SSF	D	2
b. Start 1A Hydrogen Analyzer **(SROU)**	N, A, R	5
c. Manually Start 'H' Instrument Air Compressor for 4 hour run. **(SROU)**	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: McGuire Date of Examination: June 16, 2003 Operating Test Number:

	1. GENERAL CRITERIA	Initials a	b*	c#
a.	The operating test conforms with the previously approved outline; changes are consistent with sampling requirements (e.g., 10 CFR 55.45, operational importance, safety function, distributio	CA	CDC	RAB
b.	There is no day-to-day repetition between this and other operating te[illegible] to be adm[illegible] during this examination.	CA	CDC	RAB
c.	The operating test shall not duplicate items from the applicants' [illegible]it test(s)(see S[illegible]tion	CA	CDC	RAB
d.	Overlap with the written examination and between different pa[illegible] of the opera[illegible]g test ~~categor~~ is within acceptable limits.			RAB
e.	It appears that the operating test will differentiate between com[illegible]ess-than-competent applicants at the designated license level.	CA	CDC	RAB
	2. WALK-THROUGH ~~(CATEGORY A & B)~~ C[illegible]TERIA	--	--	--
a.	Each JPM includes the following, as applicable: · initial conditions · initiating cues · references and tools, including associated p[illegible]edures · reasonable and validated time limits (aver[illegible]e time allow[illegible]d fo[illegible] specific designation if deemed to be time critical[illegible] the facility [illegible]ensee · specific performance criteria that inclu[illegible] - detailed expected actions wit[illegible]ct criteria [illegible]d nomenclat[illegible] - system response and othe[illegible]ammer cues - statements describing im[illegible]t observa[illegible]s to be mad[illegible]y the applicant - criteria for successful co[illegible]etion of the - identification of critical s[illegible]s and their [illegible]ated p[illegible]mance standards - restrictions on th[illegible]ce of steps	CA	CDC	RAB
~~b.~~	~~[illegible]ipted que[illegible]gory A are p[illegible]inantly open reference and meet the [illegible]echment [illegible]~~	N/A	N/A	N/A
~~c~~b.	Rep[illegible]erating tes[illegible] the previous licensing examination is within accepta[illegible]% for the w[illegible] and do not compromise test integrity.	CA	CDC	RAB
~~d~~c.	At le[illegible] JPMs on [illegible] test are new or significantly modified.	CA	CDC	RAB
	[illegible]TOR ~~(CATEGORY C)~~ CRITERIA	--	--	--
a.	The associated simu[illegible]rating tests (scenario sets) have been reviewed in accordance with Form ES-301-4 and [illegible]cop[illegible] is attached.	CA	CDC	RAB

	Printed Name / Signature	Date
[illegible]thor	CHARLES SAWYER / Charles Sawyer	4-23-03
[illegible]	Carroll Dean Cornwell / CD Cornwell	4-24-3
[illegible]Examiner (#)	RICHARD E. BALDWIN / [illegible]	6/12/03
d. NRC Supervisor	MICHAEL E. ERNSTES / Michael E. Ernstes	6/12/03

NOTE: * The facility signature is not applicable for NRC-developed tests.
Independent NRC reviewer initial items in Column "c;" chief examiner concurrence required.

draft

Facility: McGuire Date of Exam: Weeks of June 16 and 23, 2003 Scenario Numbers: 1 / 2 / Operating Test No.:

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.	CA	CDC	PSB
2.	The scenarios consist mostly of related events.	CA	CDC	PSB
3.	Each event description consists of · the point in the scenario when it is to be initiated · the malfunction(s) that are entered to initiate the event · the symptoms/cues that will be visible to the crew · the expected operator actions (by shift position) · the event termination point (if applicable)	CA	CDC	PSB
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.	CA	CDC	PSB
5.	The events are valid with regard to physics and thermodynamics.	CA	CDC	PSB
6.	Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives.	CA	CDC	PSB
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.	CA	CDC	PSB
8.	The simulator modeling is not altered.	CA	CDC	PSB
9.	The scenarios have been validated. Pursuant to 10 CFR 55.46(d), any open simulator performance deficiencies have been evaluated to ensure that functional fidelity is maintained while running the planned scenarios.	CA	CDC	PSB
10.	Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered in accordance with Section D.45 of ES-301.	CA	CDC	PSB
11.	All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios).	CA	CDC	PSB
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).	CA	CDC	PSB
13.	The level of difficulty is appropriate to support licensing decisions for each crew position.	CA	CDC	PSB

TARGET QUANTITATIVE ATTRIBUTES (PER SCENARIO; SEE SECTION D.4.D5.d)		Actual Attributes	--	--	--
1.	Total malfunctions (5-8)	7 / 7 / 7	CA	CDC	PSB
2.	Malfunctions after EOP entry (1-2)	2 / 2 / 2	CA	CDC	PSB
3.	Abnormal events (2-4)	4 / 4 / 4	CA	CDC	PSB
4.	Major transients (1-2)	2 / 2 / 1	CA	CDC	PSB
5.	EOPs entered/requiring substantive actions (1-2)	2 / 2 / 2	CA	CDC	PSB
6.	EOP contingencies requiring substantive actions (0-2)	0 / 0 / 0	CA	CDC	PSB
7.	Critical tasks (2-3)	2 / 2 / 2	CA	CDC	PSB

OPERATING TEST NO.:

Applicant Type	Evolution Type	Minimum Number	Scenario Number 1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP	4 RO	4 BOP
RO 1-4	Reactivity	1*								
	Normal	1*	1	5	1					
	Instrument / Component	4*	3,6	2,4,5	2,5	3,4,6				
	Major	1	7	7	7	7				
As RO	Reactivity	1*								
	Normal	0								
	Instrument / Component	2*								
	Major	1								
SRO-I										
As SRO	Reactivity	0								
	Normal	1*								
	Instrument / Component	2*								
	Major	1								
			SRO		SRO					
SRO-U 1,2	Reactivity	0								
	Normal	1*	1,5		1					
	Instrument / Component	2*	2-6		2-6					
	Major	1	7		7					

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.45.d) but must be significant per Section C.2.a of Appendix D. * Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a one-for-one basis.
(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: Charles Sawyer

NRC Reviewer: Richard S. Baldwin

OPERATING TEST NO.:

Applicant Type	Evolution Type	Minimum Number	Scenario Number 1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP	4 RO	4 BOP
RO 5,6	Reactivity	1*								
	Normal	1*		5	1					
	Instrument / Component	4*		2,4	2,5					
	Major	1		7	7					
			RO							
As RO	Reactivity	1*								
	Normal	0								
	Instrument / Component	2*	3,6							
	Major	1	7							
SRO-I 1-2					SRO					
As SRO	Reactivity	0								
	Normal	1*			1					
	Instrument / Component	2*			2-6					
	Major	1			7					
			SRO			BOP				
SRO-U 3-4	Reactivity	0								
	Normal	1*	1							
	Instrument / Component	2*	2-6			2,3, 6				
	Major	1	7			7				

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.45.d) but must be significant per Section C.2.a of Appendix D. * Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a one-for-one basis.
(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: Charles Sawyer

NRC Reviewer: Richard S. Baldwin

SRO 1 RO 1 RO 2 Competencies	SRO ~~Applicant #1~~ ~~RO/SRO-I/SRO-U~~ SCENARIO				RO ~~Applicant #2~~ ~~RO/SRO-I/SRO-U~~ RO BOP SCENARIO				BOP ~~Applicant #3~~ ~~RO/SRO-I/SRO-U~~ BOP RO SCENARIO			
	1	2	3	4	1	2	3			2	3	4
~~Understand and Interpret Annunciators and Alarms~~												
Interpret / Diagnose Events and Conditions	2-4 5	2-7			3 6	3, 4, 6			2, 5			
~~Understand Plant and System Response~~												
Comply With and Use Procedures (1)	1-7	1-7			1, 3 5, 7	3, 6, 7			2, 4 5, 7	2, 5 7		
Operate Control Boards (2)	N/A	N/A				3, 4 6, 7			2, 4 5, 7	2, 5, 7		
Communicate and Interact ~~With the Crew~~	1-7	1-7			1-7	1-7			1-7	1-7		
Demonstrate Supervisory Ability (3)	1-7	1-7			N/A	N/A			N/A	N/A		
Comply [illegible] and Use Te[illegible] (3)	3. 4	3. 4			N/A	N/A			N/A	N/A		

Notes:

(1) Includ[illegible] cificatio[illegible] compliance for an RO.
(2) Op[illegible]nal for an S[illegible]
(3) [illegible]ly applicable to [illegible]

In[illegible]ctions:

[illegible]the applicant[illegible]license type and enter one or more event numbers that will allow the [illegible]to [illegible]uate every applicable competency for every applicant.

Author: Charles Sawyer

NRC Reviewer: R. Baldwin

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SRO2 RO3 RO4 Competencies	SRO ~~Applicant #1~~ ~~RO/SRO-I/SRO-U~~ SCENARIO				RO ~~Applicant #2~~ ~~RO/SRO-I/SRO-U~~ RO BUP SCENARIO				BOP ~~Applicant #3~~ ~~RO/SRO-I/SRO-U~~ BUP RO SCENARIO			
	1	2	3	4	1	2	3		1	2	3	4
~~Understand and Interpret Annunciators and Alarms~~												
Interpret / Diagnose Events and Conditions	2-4, 5	2-7			3, 6	3, 4, 6			2, 5			
~~Understand Plant and System Response~~												
Comply With and Use Procedures (1)	1-7	1-7			1, 3, 5, 7	3, 4, 6, 7			2, 4, 5, 7	2, 5, 7		
Operate Control Boards (2)	N/A	N/A				3, 4, 7			2, 4, 5, 7	2, 5, 7		
Communicate and Interact ~~With the Crew~~	1-7	1-7			1-7	1-7			1-7	1-7		
Demonstrate Supervisory Ability (3)	1-7	1-7			N/A	N/A			N/A	N/A		
Comply [illegible] and Use T[illegible] (3)	3, 4	3, 4			N/A	N/A			N/A	N/A		

Notes:

(1) Includ[illegible]cificatio[illegible] compliance for an RO.
(2) Op[illegible]nal for an S[illegible]
(3) [illegible]ly applicable to [illegible]

In[illegible]ctions:

[illegible] the applicant [illegible] license type and enter one or more event numbers that will allow the [illegible] to [illegible]ate every applicable competency for every applicant.

Author: Charles Sawyer

NRC Reviewer: R. Baldwin

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SRO u 3 SRO I 1 RO 5 Competencies	SRO ~~Applicant #1~~ ~~RO/SRO-I/SRO-U~~ SRO BOP SCENARIO				RO ~~Applicant #2~~ ~~RO/SRO-I/SRO-U~~ SCENARIO				BOP ~~Applicant #3~~ ~~RO/SRO-I/SRO-U~~ SCENARIO			
	1	2	3	4	1	2	3	4	1	2	3	4
~~Understand and Interpret Annunciators and Alarms~~												
Interpret / Diagnose Events and Conditions	2,3, 4,5	3,4, 6			6	2-7			5			
~~Understand Plant and System Response~~												
Comply With and Use Procedures (1)	1-7	3,4, 5,7			1,3, 5,7	1-7			3,4 5,7	2,5, 7		
Operate Control Boards (2)	N/A	3,4 6,7				N/A			2,4 5,7	2,5, 7		
Communicate and Interact ~~With the Crew~~	1-7	1-7			1-7	1-7			1-7	1-7		
Demonstrate Supervisory Ability (3)	1-7	N/A			N/A	1-7			N/A	N/A		
Comply [illegible] and Use Te[illegible] (3)	3,4	N/A			N/A	3,4			N/A	N/A		

Notes:

(1) Include[illegible]cification compliance for an RO.
(2) Op[illegible]nal for an S[illegible]
(3) [illegible]ly applicable to [illegible]

draft

In[illegible]ctions:

[illegible] the applicant[illegible]license type and enter one or more event numbers that will allow the [illegible]to [illegible]date every applicable competency for every applicant.

Author: Charles Sawyer

NRC Reviewer: R. Baldwin

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

Notes:

(1) Includes ... cification compliance for an RO.
(2) Op...nal for an S...
(3) ...ly applicable to ...

In...ctions:

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

Author: Charles Lawyer

NRC Reviewer: R. Baldwin

draft

Facility: McGuire	~~Date of~~ Exam: Weeks of June 16 & 23, 2003 RO/SRO	Exam Level:

	Item Description	Initial a	Initial b*	Initial c#
1.	Questions and answers technically accurate and applicable to facility	CA	CDC	PSB
2.	a. NRC K/As referenced for all questions b. Facility learning objectives referenced as available	CA	CDC	PSB
3.	~~RO/SRO overlap is no more than 75 percent, and~~ SRO questions are appropriate per Section ~~D.2~~ d of ES-401	CA	CDC	PSB
4.	Question selection and duplication from the last two NRC licensing exams appears consistent with a systematic sampling process			PSB
5.	Question duplication from the license screening/audit exam was controlled as indicated below (check the item that applies) and appears appropriate: ✓ the audit exam was systematically and randomly developed; or __ the audit exam was completed before the license exam was started; or __ the examinations were developed independently; or __ the licensee certifies that there is no duplication; or __ other (explain)	CA	CDC	PSB
6.	Bank use meets limits (no more than 75 percent from the bank at least 10 percent new, and the rest modified); enter the actual RO / SRO-only question distribution(s) at right Bank: 36/13; Modified: 2/10; New: 37/12	CA	CDC	PSB
7.	Between 50 and 60 percent of the questions on the RO exam ~~(including 10 new questions)~~ are written at the comprehension/analysis level; the SRO exam may exceed 60 percent if the randomly selected K/As support the higher cognitive levels; enter the actual RO / SRO question distribution(s) at right Memory: 36/9; C/A: 39/16	CA	CDC	PSB
8.	References/handouts provided do not give away answers	CA	CDC	PSB
9.	Question content conforms with specific K/A statements in the previously approved examination outline and is appropriate for the Tier to which they are assigned; deviations are justified	CA	CDC	PSB
10.	Question psychometric quality and format meet ES, Appendix B, guidelines	CA	CDC	PSB
11.	The exam contains ~~100,~~ the required number of one-point, multiple choice items; the total is correct and agrees with value on cover sheet	CA	CDC	PSB

	Printed Name / Signature	Date
a. Author	CHARLES SAWYER / Charles Sawyer	4-17-03
b. Facility Reviewer (*)	Carroll Dean Cornwell / CD Cornwell	4-17-03
c. NRC Chief Examiner (#)	RICHARD S. BALDWIN / [signature]	6/12/03
d. NRC Regional Supervisor	MICHAEL E. ERNSTES / Michael E. Ernstes	6/12/03

Note: * The facility reviewer's initials/signature are not applicable for NRC-developed examinations.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only		

Instructions

[Refer to Section D of ES-401 and Appendix B for additional information regarding each of the following concepts.]

1. Enter the level of knowledge (LOK) of each question as either (F)undamental or (H)igher cognitive level.
2. Enter the level of difficulty (LOD) of each question using a 1 - 5 (easy - difficult) rating scale (questions in the 2 - 4 range are acceptable).
3. Check the appropriate box if a psychometric flaw is identified:
   - The stem lacks sufficient focus to elicit the correct answer (e.g., unclear intent, more information is needed, or too much needless information).
   - The stem or distractors contain cues (i.e., clues, specific determiners, phrasing, length, etc).
   - The answer choices are a collection of unrelated true/false statements.
   - One or more ~~than one~~ distractors is not credible.
   - One or more distractors is (are) partially correct (e.g., if the applicant can make unstated assumptions that are not contradicted by stem).
4. Check the appropriate box if a job content error is identified:
   - The question is not linked to the job requirements (i.e., the question has a valid K/A but, as written, is not operational in content).
   - The question requires the recall of knowledge that is too specific for the closed reference test mode (i.e., it is not required to be known from memory).
   - The question contains data with an unrealistic level of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons).
   - The question requires reverse logic or application compared to the job requirements.
5. Check questions that are sampled for conformance with the approved K/A and those that are designated SRO-only (K/A and license level mismatches are unacceptable).
6. Based on the reviewer's judgment, is the question as written (U)nacceptable (requiring repair or replacement), in need of (E)ditorial enhancement, or (S)atisfactory?
7. At a minimum, explain any "U" ratings (e.g., how the Appendix B psychometric attributes are not being met).

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only		
RO/SRO Combined Question															

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
1	H	3				X								E	WE09, EK2.1 (Q 47.1), **BANK**, used on prior NRC exam This question may have a problem with distractor A. I do not believe this is a credible distractor. May need to change it to something like: To collapse any voids formed in the CRD housings. This should be corrected. For informational purposes, the initial information is not really necessary for answering the question. This sort of ties it to being operationally oriented. Nothing has to be done in regards to this part of the question. KA ok. May 21, 2003
														S	Changed distractor C. Ok as is, change makes the question ok.
2	F	2-3												S	012K501 (Q 48.1), **BANK**, used on prior NRC exam Question appears to be ok. KA ok.
3	F	2-3										X		E	0026000K401 (Q 50.1), **BANK**, used on prior NRC exam The KA on the 401-2 form is ok. The KA provided matches this KA. However, the KA listed on the question page does not match the selected KA. The question meets the KA The question is ok as is, however, the KA used should be added to the question as an additional valid KA. May 21, 2003
														S	OK, changed the KA on the test question.
4	F	3												S	G 2.4.23, (Q 51.1), **BANK**, used on prior NRC exam KA appears ok Question appears ok.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
5	F	2-3										X		U	000067K302, (Q60.1), **BANK**, used on prior NRC exam The KA requires the knowledge of the reason... as they apply to a Plant Fire on Site. Steps called out in the site fire protection plan, FPS manual, and the fire zone manual. This question concerns itself with the type of fire suppression in an area and that type of hazards associated with it. This question **does NOT** meet the KA. A replacement question is necessary. May 21, 2003 Will Change this to make more operational. Need to re-review. June 3, 2003 The licensee will add the procedure number to open the valve. June 12, 2003 S Added the procedure number, ok as changed
6	H	3										X		U	EPE 0000007A1.04, (Q63.1), **BANK**, used on prior NRC exam Is it necessary in the stem to identify what bus line is supplying what? This seems to be teaching. Not sure the KA matches. The KA is: Ability to operate and monitor RCP operation and flow rates as they apply to a reactor trip. The question provides loss of bus voltage and asks what is the response to the transient in regards to the RCPs and what happens with the reactor. This is in reverse of the KA. May 21, 2003 S This question appears to be ok with licensee discussion. No change is necessary.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
7	H	2-3												E S	012000K3.02 (Q 107.1), **BANK**, used on prior NRC exam, **MODIFIED** The KA appears to be ok. The question could be enhanced if you underline the words emergency manual or manual. Or capitalize them. Either one would be ok. May 21, 2003 OK as changed.
8	F	2-3												S	092000K403 (Q 131.1), **BANK**, used on prior NRC exam KA is ok. Question appears to be ok.
9	F	2-3												S	103000A301 (Q162.1), **BANK**, used on prior NRC exam KA is ok. Appears to be ok. Question not rated for LOD by licensee. Believe it is a Memory.
10	H	3												S	010G2.1.31 (Q 164.2), **BANK**, used on prior NRC exam KA appears ok. Appears to be ok.
11	H	3												S	WE05 G2.4.18, (Q191.3), **BANK**, used on prior NRC exam Ka appears to be ok. Question Appears to be ok.
12	F	2-3												S	WE01/WE/02 K 1.20 (Q 195.5), **BANK**, used on prior NRC exam KA appears to be ok. Question appear to be ok.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
13	F	2-3				X								E	G 2.2.27, (Q 228.1), **BANK**, used on prior NRC exam Not sure why distractor A is NOT also correct. Not sure how Gamma Metric SDMs effect the answer. Discuss. May 21, 2003
														S	OK as is, no change is necessary.
14	H	3										X		U	010000K5.01 (Q 311.2), **BANK**, used on prior NRC exam NOT sure this question meets the KA. The KA concerns itself with the determination of the fluid in PZR, using steam tables. The question concerns itself with determining the temperature of a RTD on a leaking safety valve. May 21, 2003 Since the knowledge of the question is important, the question is a valid/operationally oriented question. The question will be kept, however, the KA will be changed to allow the question. The KA will be K5.02.
														S	OK as is.
15	H	3												S	000038K1.02 (Q 321.1), **BANK**, used on prior NRC exam KA appears to be ok. Question appears to be ok.
16	F	1										X		E	G 2.1.32, (Q 330.1), **BANK**, used on prior NRC exam Distractor A does not identify WHAT oil temperatures are decreasing back to design spec. Need to add what we are talking about. Distractor D does not make much sense to me. Discuss. May 21, 2003 Changed A to add the NCP oil change. OK as changed Changed D to read, this restriction ensures adequate #1 seal leak off flow.
														S	OK as changed.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
17	H	3							X					E	WE04 (Q 359.3), **BANK**, used on prior NRC exam IS this RO required knowledge? It appears that the applicants would need to have to remember the CSFSTs. Is this fair? Discuss w/ licensee. KA appears to be ok. May 21, 2003 Yes, they are expected to know this knowledge. OK as is.
														S	
18	H	3												E	000051K3.01, (Q373.1), **BANK**, used on prior NRC exam KA appears ok. Question appears to be ok. Why does the WOOTF .... have assuming at the end? May 21, 2003 OK as changed, removed the word assuming.
														S	
19	H	2-3				X								U	G.2.3.11, (Q407.1), **BANK**, used on prior NRC exams In the stem, we provide that 2 RC pumps are necessary. In the Initial conditions it states we have 3. In distractors A and C we state that only one pump is tripped as a possible reason. WHY would anyone choose those since tripping of 1 pump would bring you down to the required minimum? KA appears to be ok. Discuss with licensee. May 21, 2003 Will look at to see if we can change A or C to have 2 pumps trip. June 3, 2003 Need to review proposed change. June 12, 2003 Changed, ok as changed
														S	
20	H	3												S	G. 2.3.9, (Q 432.3), **BANK**, used on prior NRC exams KA appears to be ok. Question Appears to be ok.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
21	H	2-3										X		U	078000K4.01, (Q 451.1), **BANK**, used on prior NRC exams KA appears to NOT match. The KA is knowledge of the IAS design feature(s) and/or interlock(s) which provide for the following: Manual/automatic transfers of control. The question concerns the knowledge of what happens when there is a instrument air line rupture. How does that effect the Low pressure air system. This is an example of the next KA. 4.02, Cross-over to other air systems. May 21, 2003 This question appears to be OK after discussion with licensee. OK as IS.
														S	
22	F	2												S	056000A2.04, (Q 531.1), **BANK**, used on prior NRC exams KA appears to be ok. Question appears to be ok, not very hard.
23	H	2-3	X											E	055000K3.01 (Q547.2), **BANK**, used on prior NRC exams KA appears to be ok. The question states that there is a SUDDEN drop from 25 to 23 inches. Will the proposed malfunction cause a sudden drop? NOT sure. Can this be run on the simulator to see how long it will take? May 21, 2003 OK removed the word sudden from the stem, ok as changed.
														S	
24	F	3												E	013000K4.11, (Q 548.1), **BANK**, used on prior NRC exams Some questions Mode is Capitalized. The first letter. Make consistent. KA appears to be ok. Question, other than above appears to be ok. May 21, 2003 Capitalized Mode and is ok.
														S	

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
25	H	3												S	WE12, A1.3, (Q 593.1), **BANK**, used on prior NRC exams Could not find the lesson plan for the Steam Generators. The KA states: Abilty to operate and or monitor the following as they apply to (Uncontrolled Depressurization of ALL Steam Generators) Desired operating results during abnormal and emergency situations. Are there check valves to prevent the depressurization from all Steam Generators? If so, then the question does not meet the KA. May 21, 2003 Question is ok, does meet the KA. Question appears to be ok.
26	F	2-3												S	007000A2.02, (Q 617.2), **BANK**, used on prior NRC exams KA appears to be ok. I do not understand the answer based on the information provided. Need to have the licensee explain. Otherwise the question appears to be ok. May 21, 2003 The pressure alarm is 8 psig, therefore, the 9 psig has to be vented. OK as is.
27	H	3										X		U	073000A2.02, (Q 671.3), **BANK**, used on prior NRC exams This question does not match the KA. The KA essentially wants to know the effect of a detector failure on the PRM system. The question, however, asks what has to be done to the release, continue, stop etc. This does not match the KA May 21, 2003 Will tie the automatic response of the valve into 2 distractors. Will look at June 11, 2003 Replaced because the original one was close to the SRO exam. 1074 new number NEW. June 12, 2003 S Changed , ok as changed.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
28	F	2-3												S	W/E15G.2.1.7, (Q 891.2), **BANK**, used on prior NRC exams KA appears to be ok Question matches KA Question appears to be ok.
29	H	2-3												S	000058K1.01, (Q 895.10), **BANKModified**, used on prior NRC exams KA appears to be ok., Question matches KA and question appears to be ok.
30	F	2-3				X								E	063000A1.01, (Q 906.1), **BANK**, used on prior NRC exams KA appears to be ok. Question matches the KA Not sure from the supplied reference material, the word used in two stems, "Exponentially" is totally correct. Has this relationship been identified in some other reference material? Discuss May 21, 2003 The licensee will change from exponential to "at a faster rate". Could not find the document where it suggests that it is exponential. S OK as changed.
31	F	3				X								E	017000A3.01 (Q 911.2), **BANK**, used on prior NRC exams KA appears to be ok. Question matches the KA Could change some of the distractors to mimic B the answer. Use something like: S/G pressures are decreasing and T_{HOT} is at S/G saturation temperature. At least you would have to distinguish the difference between these. The other distractors did not seem all that familiar. May 21, 2003 Will change distractor "D" to mimic B, that way they will have a Thot in the answer. S OK as changed.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
32	F	2-3												S	022000K2.01, (Q 957.1), **BANK**, used on prior NRC exams KA appears to be ok. Question matches the KA and appears to be ok
33	F	3												S	0000051A1.04, (Q 963.1), **BANK**, used on prior NRC exams KA appears to be ok. Question matches the KA and appears to be ok
34	H	3												S	026000K4.07, (Q 975.1), **BANK**, used on prior NRC exams KA appears to be ok. Question matches the KA and appears to be ok IS this something the RO should know from memory? As licensee. May 21, 2003 Yes, they are supposed to know this from memory.
35	H	3												S	072000A3.01, (Q 976.1), **BANK**, used on prior NRC exams KA appears to be ok. Question matches the KA and appears to be ok Have licensee explain answer. May 21, 2003 Already in the filter mode before going to refueling. Ok as changed.
36	H	3												S	003000A3.03, (Q 977.1), **BANK**, used on prior NRC exams KA appears to be ok. Question matches the KA and appears to be ok
37	F	2-3												S	G2.1.3, (Q 984.1), **BANK**, used on prior NRC exams KA appears to be ok. Question matches the KA and appears to be ok What is ZPPT? May 21, 2003 Zero Power Physics Testing. OK

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
38	H	2-3	X											E	G2.3.10, (Q 1012.1), **BANK**, used on prior NRC exams KA appears to be ok. Question matches the KA and appears to be ok Do we need to add what procedure we are using in the stem? May 21, 2003
														S	OK as is, no change necessary.
39	F	3	X			X								E	000008A2.06, (Q 1022), **NEW**, KA appears to be ok. Question matches the KA and appears to be ok The wording of the stem could be better. Currently it states, I If pressure increases to 400 psig, which one of the following describes the correct inputs for a PORVs to actuate in LTOP mode? This could be written to say: If pressure.....input for a PORV to actuate in the LTOP Mode. Additionally, could we change one of the distractors from the D loop, to have 2 Ds and 2 Cs? May 21, 2003 Will look at this to see if C can use C loop cold leg May 28, 2003
														S	OK as changed.
40	F	2-3												S	000015/17A2.01 (Q 1023), **NEW** KA appears to be ok. Question matches the KA and appears to be ok Discuss with licensee the lineup in the initial conditions. A train essentials what does that mean for the non essentials? Explain May 21, 2003 OK as is, no changes necessary.
41	H	3												S	000027K3.03, (1024), **NEW** KA appears to be ok. Question matches the KA and appears to be ok

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
42	H	2-3												S	000009K3.13, (Q 1025), **NEW** In the initial conditions d), should use are vice "is." KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003 Change is ok
43	H	3												S	000022K1.01, (Q 1026), **NEW** KA appears to be ok. Question matches the KA and appears to be ok
44	F	2-3												S	000025K2.02, (Q 1027), **NEW** KA appears to be ok. Question matches the KA and appears to be ok From the material attached, could not determine the answer. May 21, 2003 Will have to add an additional bullet, to state the B ND pump is aligned for Aux. Containment Spray. This clarifies the correct answer.
45	F	2	X									X		U S	000040AK3.01, (Q 1028), **NEW** Not sure the first piece of information that describes the plant condition is necessary to answer the question. Not sure this question matches the KA. The KA asks for the "knowledge for the reason for (Operation of steam isolation valves) as they apply to the Steam line Rupture. The question asks what is the logic to actuate the Main Steam Isolation (MSI) signal? Are they the same? May 21, 2003 OK as is, no change is necessary.
46	H	3												S	000003AK1.07, (Q 1029), **NEW** KA appears to be ok. Question matches the KA and appears to be ok
47	F	2-3												S	003000K6.04, (Q 1030), **NEW** KA appears to be ok. Question matches the KA and appears to be ok

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
48	H	3												E	059000K4.02, (Q 1031), **NEW** Could we use a value for S/G A level vice the HI HI? That would require the applicant to recall that the value give is above the HI HI. The reference material puts the trip set point in a HI HI. This is not what the applicant would see on the board, but they would receive the Annunciator. You could also put the annunciator that would come in. Otherwise: KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003 Added a S/G level of 84 % vice the HI HI OK as changed.
49	F	3												S	039000A4.04, (Q 1032), **NEW** Missing a period on distractor B. Otherwise: KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003 Change made ok as is.
50	H	3												S	000068AA2.04, (Q 1034), **NEW** Need a coma in the first sentence after the word site. Need two spaces, vice one in front of Chlorine gas has entered the control room. Otherwise: KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003 OK as changed.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
51	H	2-3	X			X								U	000055AA1.02, (Q 1036), **NEW** In the initial conditions, remove the word up in the second bullet, state it started in auto, vice started up in auto. Third bullet, An operator or the RO, which one has sent someone to depress the emergency pushbutton. In the question do you mean the operator should Push the EMERGENCY STOP RESET PUSHBUTTON? Is this different from the Emergency STOP PUSHBUTTON? It seems to me it is. Discuss with licensee. May 21, 2003 This is the RESET pushbutton. Will change the nomenclature for the pushbutton. Also will pull out the reset pushbutton from each of the distractors. This will make the question correct. Review when changed. May 28, 2003 This question was changed once again, will review June 11. June 12, 2003
														S	Changed, ok as changed
52	F	2-3	X			X								U	062000A1.03, (Q 1038), **NEW** Stem of the question does not make sense to me. Looks like the word failing should not be in the question. Why are distractors B and D a viable? What is the connection between EVDA and KRP? Additionally, distractor D would be better if you used manual cross connect between EVDA and EVDS. EVDD has not physical connection. Why would anyone pick this? Change distractors B to something that makes sense. KRP is not even listed on the print provided. Where does it come from? May 21, 2003 Will remove failing from the stem. Will Change B to look more like C with EVCC as the power supply. May 29, 2003
														S	OK as changed

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
53	H	3												U	025000K3.01, (Q 1039), **NEW** Where did the 20 minutes come from in distractors A and C? Is this some number the applicants are bound to mix up? Discuss Why would an applicant from McGuire determine the design pressure is 20, the distractor analysis states that 20 psig. May 21, 2003 Will change the 20 pounds to 60 pounds in C and D. Will use 50 minutes vice 20 minutes. May 29, 2003 change is ok
														S	
54	F	2												S	001000K2.05, (Q 1040), **NEW**, KA appears to be ok. Question matches the KA and appears to be ok
55	F	2												S	028000K2.01, (Q 1041), **NEW** KA appears to be ok. Question matches the KA and appears to be ok
56	H	3												S	002000K6.06, (Q 1043), **NEW** KA appears to be ok. Question matches the KA and appears to be ok
57	F	2-3												S	014000A4.02, (Q 1044), **NEW** Could we make the question such that the applicant would have to answer what the value would be in automatic as well as manual rod control? That would provide some more substance to the question. If not: KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003 OK as is no changes necessary.
58	F	2-3												S	G2.4.34, (Q 1045), **NEW** KA appears to be ok. Question matches the KA and appears to be ok

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
59	F	2-3												S	005000K6.03, (Q 1047), **NEW** Do we have to use the noun names for the two EMFs listed, 1 and 41? Or does that give it away? This question may be more than memory, it does have some analysis in it. Otherwise: KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003 no change necessary. Do not add the noun names. Gives away the floor level the leak could be.
60	F	2-3												S	064000K4.02, (Q 1048), **NEW** KA appears to be ok. Question matches the KA and appears to be ok
61	H	3				X								E S	064000A4.07, (Q 1049), **NEW** Does the noun name for the procedure number need to be added to the stem? The stem is redundant in that the first sentence states the DG has been started IAW procedure XXX. Then the next sentence states the DG was started from the control room. These could be combined to make it flow better. Each distractor has some of the same information, however, the nomenclature used in one is not exactly the same as the other. For example, distractor A (fourth item) has '1B D/G Gov Control' pushbutton, but distractor C (third item) identifies the same item as Gov Control pushbutton. Need to go thru distractors and make like items the same. Distractor B has an extra quote after the word Switch'. The stem asks what actions are necessary, we need to add the sequence is also necessary, it may be assumed that just the actions and not the sequence is important. IS this something an operator is expected to know from memory? May 21, 2003 Ok as changed.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
62	H	2-3												E	004000K1.16, (Q 1050), **NEW** How is distractor C viable? From the diagram provided, it does not seem like there is another boric acid filter. Discuss Otherwise, KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003
														S	OK as is, no change is necessary.
63	H	3												E	WE04, EK2.1 (Q 1051), **NEW** There is additional information on the ES-401-2 form, in the KA topic information block. Additionally, the KA number in the block is different from the KA sheet used as a reference. The block states 2.10 but the sheet provided is EK 2.1 Otherwise, KA appears to be ok. Question matches the KA and appears to be ok. May 21, 2003
														S	OK, just add the KA number in the description.
64	F	2												S	016000K5.01, (Q 1052), **NEW** KA appears to be ok. Question matches the KA and appears to be ok
65	H	3												S	000056EK1.04, (Q 1056), **NEW** KA appears to be ok. Question matches the KA and appears to be ok Is this something an RO would be expected to do? May 21, 2003 Yes, this is RO knowledge
66	H	3												S	061000K5.01, (Q 1059), **NEW** KA appears to be ok. Question matches the KA and appears to be ok

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
67	H	3												E	000029EK1.01, (Q 1061), **NEW** In the stem, the wording for item 2 does not seem correct. Seems like there is a word missing like "turbine" after runback Otherwise, KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003
														S	OK as changed.
68	F	3												S	027000K1.01, (Q 1062), **NEW** KA appears to be ok. Question matches the KA and appears to be ok
69	H	2-3												U	000026G2.4.47, (Q 1063), **NEW** This question seems to be a direct lookup with the reference provided. When I reviewed this question, I flipped thru the procedure and found the spot where it requires you to trip the reactor and all NC pumps. That cued me into the correct answer. Can this question be given without the use of the reference? May 22, 2003 In front of the 4th bullet add ALL In front of the 5th bullet, change it to read, All NCP Pump upper Motor bearing temperatures trending up with B NCP 197. No Reference will be provided. Change will be ok. May 28, 2003
														S	Change was reviewed and is acceptable.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
70	H	2-3												U	WE01/02EK2.2, (Q 1064), **NEW** In the sample plan have extra words in the KA description. This question is similar to the above question in that, the answer is sort of a direct look up using the procedure. Not sure this is allowable. Can this question be administered without the procedure? If not it may have to be replaced. May 22, 2003 Will add to the IC that a valid SS, ST and SP signals and then add 25 % PZR level. With the changes question is OK May 28, 2003 Did more changes at the site, need to re-review this on June 11, 2003
														S	
71	H	3												S	008000a4.06, (Q 1066), **NEW** KA appears to be ok. Question matches the KA and appears to be ok
72	F	2-3				X								E	G2.4.22, (Q 1068), **NEW** Need a period at the end of distractor 'A'. Need to underline the key words, in 'A', extreme, in 'B', not satisfied, in 'C' higher priority, in 'D', extreme. That would cue them into these important words. May 21, 2003
														S	OK as changed.
73	F	3												S	G 2.2.2 (Q 1069), **NEW** KA appears to be ok. Question matches the KA and appears to be ok
74														S	076000A1.02, (Q 1070), **NEW** KA appears to be ok. Question matches the KA and appears to be ok

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
75														S	006000K3.01, (Q 1046), **NEW** This question has not been evaluated because the question was not in the exam package. CWS notified, will bring on May 21 for the review. May 21, 2003 Question was not provided. The provided question appears to be ok, KA matches ok.
SRO ONLY															
1	F	2											X	U	000054AA2.04, (Q 16.1), **BANK** The licensee considered an SRO ONLY question. The NRC evaluated this question was evaluated as an RO knowledge. This question does NOT meet the SRO only requirement. ES 204 Section D.1.c requires the developer to pay "Special Attention is required to ensure that the SRO examination tests at the appropriate level." May 22, 2003 Need to reevaluate how to make this SRO. June 11, 2003 S The replacement question meets the KA and appears to be ok.
2	F	2-3	X			X								E	000036AA2.03, (Q 33.1) **BANK** Distractor A has a period after Tank that needs to be removed. Not sure distractor D is a reasonable distractor. Seems as if this should have been inflated prior to fuel movement. Discuss. Is it necessary to state in the IC that a leak has developed. Could you not use the indications and actual numbers for the EMFs that are coming in alarm? May 21, 2003 OK for the IC change, D is ok, no change necessary. S Ok as changed.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
3	F	3												E	025000G2.2.22, (Q 40.1), **BANK** Capitalize the T and S in the stem for tech spec. KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003
														S	OK as changed.
4	H	2-3											X	U	G2.3.2, (Q 124.1), **BANK** This question is not considered to be an SRO only level question. Reactor Operators should also know how to determine this. Discuss, this question may have to be replace. May 22, 2003 Will look into making this a situation using some people in different situations for the SRO to MAKE a DECISION, Will review June 11, 2003
														S	The replacement question better identifies the SRO task level. The replacement appears to be ok.
5	H	3												E	103000A2.01, (Q207.1), **BANK** Would like to have the distractors listed in ascending order. 36, 37, 42 and then 43 Otherwise, KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003
														S	OK as changed.
6	H	2-3												S	G 2.4.5, (Q 338.1), **BANK** KA appears to be ok. Question matches the KA and appears to be ok

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
7	H	2												E	G 2.1.25, (697.3), **BANK** This question actually is kind of trivial with the reference material provided. While the question is ok, would like to change the 0300 time data to allow the Boron concentration to be within spec. and change the 0400 data to allow the 41% be the first time exceeding an LCO. May 21, 2003
														S	OK as changed.
8	F	2												S	WE07 EA2.10, (Q 776.1), **BANK** KA appears to be ok. Question matches the KA and appears to be ok
9	H	2				X								U	033000A2.02, (Q 892.3), **BANK** Not sure why anyone one select Loss of Refueling Canal Level. The stem initial conditions only speaks to the SFP, it does not address the Refueling Canal. Additionally, what is the status of the refueling canal, is it full? That makes 2 of the distractors not credible. KA is ok. The question as its written fits the KA. See above discussion. May 22, 2003 Will Change C and D to AP 21 for loss of KC and leakage. Then add KF to both distractors. Change Looks OK, will review change when made. May 29, 2003
														S	Change reviewed and is acceptable.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
10	H	2-3											X	U	000062AA2.02, (Q 894.1), **BANK** KA on the question does not match the KA on the sample plan. First bullet, clarify that "B" essential train, is the RN train. Clarify what testing is being done on the 2"A" RN pump, list the corresponding procedure number with noun name. Not sure why this system interaction question is an SRO only question. May need to replace with SRO ONLY knowledge question. May 22, 2003 DO not need the information for the A RN train. LOOK at changing the question using risk, that uses 4 maintenance activities. May 29, 2003 Change question to (Q 894.2) the change is ok.
11	H	3											X	S	000028AA2.09, (Q 902.2), **BANK** KA is ok. Not sure why this system interaction question is an SRO ONLY question. May need to replace this for an SRO ONLY question. May 22, 2003 Will Look at to see what needs to be done. May 29, 2003 Will rewrite and will review on June 11, 2003 June 11, 2003 Revised question appears to be ok. New question number 1071

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
12	F	2												S	G 2.1.10, (Q 991.1), **BANK** It seems that an RO would also be required to have this knowledge requirements. However, this will be accepted as an SRO ONLY knowledge. KA appears to be ok. Question matches the KA and appears to be ok
13	F	2-3												S	G 2.2.25 (1004.1), **BANK** KA appears to be ok. Question matches the KA and appears to be ok
14	H	2-3				X								U	WE/11 AA2.10, (Q 1033), **NEW** This question appears to be a direct look up. The applicant has to obtain the procedure and proceed thru it without much skill to determine what initial conditions matches the procedure step. This is not much chance for error. Going thru procedure ES-1.3, there are NO kickouts to any of the other procedures identified in the distractors. Why would these be credible distractors if they are not listed in the procedure? This question may have to be replaced. May 22, 2003 Will look at to see if can not provide the reference material. May 28, 2003 Will remove the allowance for the reference. Additional changes are acceptable. S
15	H	3												S	000029EA2.02, (Q 1035), **NEW** KA appears to be ok. Question matches the KA and appears to be ok In the distractor analysis, for distractors A and B, the at before valid should be an a. May 21, 2003 OK as changed.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
16	H	3-4												S	WE/12 EA2.1 (Q 1037), **NEW** The KA value on the exam question is correct, the KA value on the sample plan is 2.10, which is not correct. The importance value for the SRO level is the Ros, 3.2, it should read 4.0. KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003 Changed ok.
17	H	3												S	W/E 16 G. 2.1, (Q 1042), **NEW** The KA value on the exam question is correct, the KA value on the sample plan is 2.10, which is not correct. KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003 OK changed.
18	H	3												S	006000G2.2.4, (Q 1053), **NEW** KA importance value on sample plan is incorrect, should be 4.3 vice 3.2. KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003 OK as changed.
19	H	2												S	022000G 2.1.12, (Q 1054), **NEW** KA importance value on sample plan is incorrect, should be 4.0, vice 3.4 Seems kind of easy, but ok. Almost a DLU. KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003 Changed the KA value. OK as changed

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
20	H	3												S	000026AA2.05, (Q 1055), **NEW** KA importance value on sample plan is incorrect, should be 3.5 vice 3.1 Not sure agree with the answer, the minimum flow in step 33 states 1000 to 1500, then in step 43 it states greater than 1500. Explain. KA appears to be ok. Question matches the KA and appears to be ok May 21, 2003 Changed the KA value, ok May 21, 2003 OK, no change is necessary. Understand the mechanics of the question.
21	H	3												S	000056AA2.32, (Q 1057), **NEW** KA appears to be ok. Question matches the KA and appears to be ok
22	H	3												E S	000060G2.3.8, (Q 1058), **NEW** KA on sample plan value is incorrect, should be 3.2 vice 2.9 KA appears to be ok. Question matches the KA and appears to be ok There is an RO question that concerns itself with a similar question, need to find that one to see if it provides additional information for the SRO-I applicant. May 21, 2003 The question will reword the answer. May add the word release to the distractor, B. However, the other question does not repeat the RO question. This will have to be re-reviewed by Dean, at the site.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
23	F	2-3										X		U	041000G2.4.20, (Q 1060), **NEW** KA on sample plan is incorrect, should be 4.0 vice 3.3 I do not believe the KA is met by the question. The note in the procedure discusses the value at which you keep the steam generator pressure decrease at less than - 2 psig/second will prevent an MSIV isolation. The question concerns itself with the method of recovering the cooldown function IF the MSIVs close. Discuss with licensee May 22, 2003
														S	After discussion, agree the question meets the KA
24	H	3										X		U	G 2.23, (Q 1065), **NEW** Explain how this works. Not sure this is an SRO only question, RO's should also know how this system functions during a test. Discuss with licensee. May 22, 2003
														S	After discussion, agree the question meets the KA and is an SRO knowledge.
25	F	2-3												S	G 2.4.22, (Q 1067), **NEW** KA appears to be ok. Question matches the KA and appears to be ok

Facility: McGuire	Date of Exam: June 30, 2003	Exam Level: **RO**/SRO

	Item Description	Initials a	b	c
1.	Clean answer sheets copied before grading	[illegible]	NA	[illegible]
2.	Answer key changes and question deletions justified and documented	[illegible]		[illegible]
3.	Applicants' scores checked for addition errors (reviewers spot check > 25% of examinations)	[illegible]		[illegible]
4.	Grading for all borderline cases (80 +/- 2% overall and 70 +/- 4% on the SRO-only) reviewed in detail	[illegible]		[illegible]
5.	All other failing examinations checked to ensure that grades are justified	[illegible]		[illegible]
6.	Performance on missed questions checked for training deficiencies and wording problems; evaluate validity of questions missed by half or more of the applicants	[illegible]		[illegible]

	Printed Name / Signature	Date
a. Grader	Richard S. Baldwin [signature]	7/29/03
b. Facility Reviewer(*)	N/A	
c. NRC Chief Examiner (*)	Kathleen O'Donohue / Kathleen O'Donohue	7/29/03
d. NRC Supervisor (*)	MICHAEL E. ERNSTES / Michael E. Ernstes	7/29/03

(*) The facility reviewer's signature is not applicable for examinations graded by the NRC; two independent NRC reviews are required.

Facility: McGuire	Date of Exam: June 30, 2003	Exam Level: RO/**SRO**

	Item Description	Initials a	b	c
1.	Clean answer sheets copied before grading	KAS	N/A	✓
2.	Answer key changes and question deletions justified and documented	KAS		✓
3.	Applicants' scores checked for addition errors (reviewers spot check > 25% of examinations)	KAS		✓
4.	Grading for all borderline cases (80 +/- 2% overall and 70 +/- 4% on the SRO-only) reviewed in detail	KAS		✓
5.	All other failing examinations checked to ensure that grades are justified	KAS		✓
6.	Performance on missed questions checked for training deficiencies and wording problems; evaluate validity of questions missed by half or more of the applicants	KAS	✓	✓

	Printed Name / Signature	Date
a. Grader	Richard S. Baldwin / Richard S. Baldwin	7/28/03
b. Facility Reviewer(*)	N/A	
c. NRC Chief Examiner (*)	Kathleen O'Donohue / Kathleen O'Donohue	7/28/03
d. NRC Supervisor (*)	MICHAEL E. ERNSTES / Michael E. Ernstes	7/28/03

(*) The facility reviewer's signature is not applicable for examinations graded by the NRC; two independent NRC reviews are required.

McGuire 2003 Initial Examination		
	Task Description	Date Complete
1.	Facility written exam comments or graded exams received and verified complete	7/08/03
2.	Facility written exam comments reviewed and incorporated and NRC grading completed, if necessary	7/16/03
3.	Operating tests graded by NRC examiners	7/28/03
4.	NRC Chief examiner review of written exam and operating test grading completed	7/28/03
5.	Responsible supervisor review completed	7/29/03
6.	Management (licensing official) review completed	7/30/03
7.	License and denial letters mailed	7/30/03
8.	Facility notified of results	7/30/03
9.	Examination report issued (refer to NRC MC 0612)	8/7/03
10.	Reference material returned after final resolution of any appeals	NA

NRC EXAM

2003

SCENARIOS

Facility: McGuire Scenario No.: 1 Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 100% Power, 'B' Train Components in Service, '1A' Auxiliary Feedwater Pump is tagged, '1A" Diesel Generator is tagged, thunderstorms are in the area

Turnover: Perform turbine Bearing Oil Pump Performance Test

Event No.	Malf. No.	Event Type*	Event Description
1		N	(RO) Main turbine Bearing Oil Pump Test
2		C	(BOP) 1NV-137 Fails to Hold UP Tank (ARP)
3		I	(RO) S/G 'B' Steam Pressure Channel 1 Fails
4		C	(BOP) ETB Blackout due to Ground Fault
5		N	(BOP) Establish Normal Letdown
6		C	(RO) '1B' FWPT Trips and Runback to 50%
7		M	ATWS/Loss of Heat Sink
			Second FWPT trips after crew settles out in AOP.
			No Auto SI, Failure of Auto Turbine Trip
			TD CA pumps trips on overspeed
			Failure of turbine to runback automatically

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

PROGRAM: McGuire Operations Training

MODULE: Initial License Operator Training Class 21

TOPIC: Nuclear Regulatory Commission Simulator Exam

Scenario 1

REFERENCES:

1.	McGuire Technical Specifications	
2.	PT/1/B/4250/028	Main Turbine Bearing Oil Pump Test
3.	AP/1/A/5500/03	Load Rejection
4.	AP/1/A/5500/06	Loss of S/G Feedwater
5.	AP/1/A/5500/07	Loss of Electrical Power
6.	AP/1/A/5500/12	Loss of Letdown, Charging or Seal Injection
7.	EP/1/A/5000/E-0	Reactor Trip or Safety Injection
8.	EP/1/A/5000/FR-S.1	Response to Nuclear Power Generation/ATWS
9.	EP/1/A/5000/FR-H.1	Response to Loss of Secondary Heat Sink
10.	RP/O/A/5700/00	Classification of Emergency

Author:
Facility Review:

April 3, 2003
Rev.1

EVENT SUMMARY

1. Main Turbine Bearing Oil Pump Test.
2. 1NV-137 fails to HUT.
3. S/G B Channel 1 Steam Pressure fails High. Enter AP-6
4. 1ETB B/O. Ground fault on bus. Enter AP-7
5. Place Normal Letdown in service, per AP-12
6. Load Rejection due to trip of 1B FWPT with a failure of the Turbine to runback. Enter AP-03
7. ATWS. Failure of Auto & Manual Rx trips, failure of Auto turbine trip on loss of 2nd FWPT. Enter E-0 and transition to FR-S.1.
8. Loss of Heat Sink. "A" MDCA tagged in Initial Conditions, "B" MDCA unavailable due to BO on 1ETB and TDCA trips on over speed when started. Enter FR-H.1

	Bench Mark	ACTIVITY	DESCRIPTION
☐	Sim. Setup	**Rod Step On**	
☐		**IC - 130**	
☐		**RUN**	
☐		**Update** Status Board, **Setup OAC** **Setup** ICCM, Turbine Displays, & Trend Recorders. **Check** Rod Step Counters agree with rod positions	See Shift Turnover Information
☐		**(M) EPQ001A** **Set = 1**	Loss of D/G "1A" Control Power
☐		**(LOA) CA009** **Set = F**	Rackout breaker for "1A" Auxiliary Feedwater Pump
☐		**(M) IPE001A** **(M) IPE001B** **(M) IPE002A** **(M) IPE002B**	Defeats automatic and manual reactor trips
☐		**(M) DEH002B6** **(M) DEH003A**	Blocks all turbine runbacks Failure of Auto Turbine tripped blocked

	Bench Mark	ACTIVITY	DESCRIPTION
☐		**(M) CA005**	Turbine Driven AFW pump trips on over speed
☐		**(M) ISE002A** **(M) ISE002B**	Failure of automatic Safety Injection – both trains
☐		**Freeze.**	
☐		**Update Fresh Tech. Spec. Log.**	
☐		**Fill out the NLO's Available section of Shift Turnover Info.**	
☐	Prior to Crew Briefing	**RUN**	
☐	**Crew Briefing** 1. Assign Crew Positions based on evaluation requirements 2. Review the Shift Turnover Information with the crew. 3. Direct the crew to Review the Control Boards taking note of present conditions, alarms.		
☐	T-0	Begin Familiarization Period	
☐	At direction of examiner	**(OVR) NV070D** **Select: ON**	1NV-137 to HUT
☐	At direction of examiner	**(XMT) SM016** **Ramp = 10** **Set = 1300, insert**	Fails S/G "B" Steam Pressure Channel 1 HIGH
☐	At direction of examiner	**(M)EP008B** **Insert**	Loss of 1ETB due to ground Fault
☐		**(M) KC008C** **Set = 0, insert** **(M) KC007D** **Set = 0, insert**	Allow manual closing of 1KC18B and 1KC-228B

	Bench Mark	ACTIVITY	DESCRIPTION
☐	*At direction of* examiner	**(M) LF002B** **Set = 100, insert** **(M) LF003B**	*Initiates a oil leak on 1B FWPT* Trips the "1B" FWPT if necessary – Initiates an turbine runback – RO must manually runback the turbine
☐	At direction of examiner	**(M) IWE002A** **Set - 125** **(M) LF003A**	Speeds up "A" FWPT Trips the "A" FWPT and initiates an ATWS
☐		**(MAL) IPE001A** **(MAL) IPE001B**	Delete – Opens reactor trip breaker 30 seconds after request by operator
		(MAL) ISE007A **Block Both** **(MAL) ISE007B** **Block Both**	Allows feedwater to be reset in H-1
☐	**Terminate the scenario upon direction of Chief Examiner**		

EVENT 1: Normal Operations – PT/1/B/4250/028 Main Turbine Bearing Oil Pump Test

Time	Pos.	Expected Actions/ Behavior	Comments
	SRO RO	Determine if Prerequisite System Conditions and required Unit Status are met.	Maintenance will not need to take vibration readings during PT.
	SRO RO	Perform section of PT Testing Oil Pumps with Turbine on Line	
	RO	Start "Brg Oil Pump/GSOB Pump	
	RO	Stop and ensure in auto Brg Oil Pump/GSOP Pump	
	RO	Start Emerg Brg Oil Pump	
	RO	Stop and ensure in Auto Emerg Brg Oil Pump	
	RO SRO	Verify Acceptance Criteria met.	

Event 2: 1NV-137 Fails to HUT position

	Pos.	Expected Actions/ Behavior	Comments
	BOP	Recognizes 1NV-137 failing to HUT	
	SRO	Directs BOP to Place 1NV-137 in VCT position	
	SRO	Direct WCC to have WR written and have I&E investigate and repair.	

Event 3: Steam Generator "1B" Steam Pressure Channel 1 Failure **HIGH**

Time	Pos.	Expected Actions/ Behavior	Comments
	BOP	Refer to annunciator responses • A-2 • C-2	Per annunciator response and AP/06 the operator will swap failed channel to operable channel
	SRO	Enters AP/06 Loss of S/G Feedwater	
	RO	Places Feed Regulator to Manual Restores S/G level to program level	*Immediate Action*
	RO	Checks the following channel indicating the same: • Feed flow • Steam Flow • S/G Level	*Immediate Action* Selects operable channel
	RO	Checks the reactor trip breakers closed > P-11	Yes
	RO	Monitor S/G NR Level	If at any time S/G NR Level approaches 17% or 83%, then trip Reactor
	BOP	Check CM/CF feeding S/G	
	RO	S/G level stable or trending to program	
	BOP	Checks NC temperature with NC pumps on stable or trending to programmed temperature	
	RO	When the following are met then return affected S/G CF control to automatic 1. Selected control channels indicated correctly • Feed flow • Steam flow • S/G level 2. Affected S/G level restored to program level 3. Automatic control is desired	
	RO	Checks proper CF alignment	
	SRO	Contacts WCC to have WR written, have I&E investigate and repair failed channel and evaluate T.S.. Exit procedure	**Failure will not be repaired** **Tech Spec 3.3.2.4.d.1 / 3.3.2.d.2 / 3.3.4.3.b / 3.3.3.19 / 16.10.1**
		At this time 1ETB blacks out	

Event 4: B/O 1ETB Ground Fault

Time	Pos.	Expected Actions/ Behavior	Comments
	Crew	Recognizes loss of operating train "ETB"	
	SRO	Enters AP/07 Case 2	
	BOP	Checks bus energized and sequencer applying loads	*Immediate Actions* The D/G will not start due to a ground fault on 1ETB.
	BOP	If both NV pumps off, Then isolate NORMAL letdown. Start opposite train: • NV pump • KC pump • RN pump Go to step 3	*Immediate Actions*
	BOP	Verifies NO Safety Injection has occurred If both NV pumps off then isolate: • Excess letdown • ND letdown If any pump was manually started per step 1 go to step 5	"A" train NV pump will be on
	BOP	Check D/Gs - OFF	yes
	BOP	Check ND system in RHR mode at time of B/O	No Go to step 7
	BOP	Align KC as follows: • Places 1KC-51A to AUTO • Ensures the following are open 1. 1KC-3A 2. 1KC-230A 3. 1KC-394A 4. 1KC-345A 5. If needed keep thermal barrier valves open raise KC flow to KF Hx by opening 1KC-149 • Ensures KC flow is less than 4000 gpm per operating KC pump	
	BOP	Checks any charging pump – Running - YES	
	BOP	Align RN as follows: • Check 1A RN pump – Running – YES • Ensure 1RN-86A is open • Close 1RN-43A • Throttle 1RN–89A to desired cooling	
	SRO	Notifies Unit 2 RO to start 2A RN pump	**EXAMINER CUE:** **2A RN pump is running**

Time	Pos.	Expected Actions/ Behavior	Comments
	SRO	Checks B/O on 1ETA	No, go to step 22
	SRO	Dispatches operator to close: • 1KC-228B • 1KC-18B	
	SRO	Checks 1B ND train – was in RHR mode	No. Go to step 29
	SRO	Checks normal letdown – IN SERVICE	No, have BOP place letdown back in service per AP12.
	SRO	Will hand off to BOP AP-12 and direct him to place normal Letdown in service. And continue on in AP-7	BOP will place letdown back in service per AP-12.
	RO	Check VCT make up Control system	
	RO	Announce occurrence on page	
	SRO	Check if an SI has occurred during the event.	An SI has not occurred; the SRO will go to the RNO. He may ask the Unit 2 BOP to perform EP/1/A/5000/G-1 Encl. 13 or he may direct the Unit 1 RO to perform it. It is time critical to have the enclosure initiated within 30 minutes of the BO
	SRO	Have available licensed operator initiate Encl. 7	He may ask the Unit 2 BOP to perform Encl. 7 or he may direct the Unit 1 RO to perform it. It is time critical to have the enclosure initiated within 30 minutes of the BO
	RO	Checks D/G on bus that BO is on. If it is not known that bus is locked out the RO will be directed to attempt to start D/G.	
	SRO	Will go to step 42 per RNO step 40. Determine an S/I has not occurred and go to step 44	
	RO	Control CA flow	All CA will be off.
	RO	Place recirc valve for KC pumps to auto for A Train and to Close for B Train	
	SRO	Will continue through AP-7	

Event 5: Placing Letdown in Service

Time	Pos.	Expected Actions/ Behavior	Comments
	BOP	If a loss of charging through the Regenerative HX has occurred, Then ensure closed • 1NV-458A • 1NV-457A • 1NV-35A	No
	BOP	Check PZR Level < 96%	
	BOP	If at any time "REGEN HX LETDN HI TEMP" alarms, close: • 1NV-1A • 1NV-2A	BOP will take action if appropriate
	RO	Stop any power or temperature changes in progress	
	RO	Announces occurrence on page	
	SRO	IF this AP entered due to loss of letdown only, then go to step 36.	SRO will go to step 36 in this AP
	BOP	Ensure Closed • 1NV-457A • 1NV-458A • 1NV-35A	
	BOP	Ensures "NC Sys M/U Controller" in AUTO	
	BOP	Ensures charging flow going down to maintain Pzr at program level	
	BOP	Checks "Letdn Relief Hi Temp" alarm has remained dark	
	BOP	Checks 1NV-21A – closed	
	BOP	Checks Pzr heater group supply breakers - closed	
	BOP	Checks normal PZR Spray available	
	BOP	Place A, B, and D PZR heater groups in manual and on	Maximizes spray flow
	BOP	Checks the following OPEN • 1NV-1A • 1NV-2A	
	SRO	Go to step 48	

	Pos.	Expected Actions/ Behavior	Comments
	BOP	Establish normal Letdown • Ensure 1NV-459 closed • Place 1NV-124 in manual and 10 to 20% open • Check 1NV-1A and 1NV-2A open • Establish Regenerative Hx cooling by throttling 1NV-28 to establish 65 gpm charging flow and throttling 1NV-241 to establish 8 gpm seal flow • Open 1NV-7B,1NV-1A, 1NV-2A & 1NV-35A • Letdown isolated < 1 hour • Throttle open 1NV-459 to establish letdown flow • Adjust 1NV-124 to maintain Letdown pressure between 250 & 350 psig • Adjust charging flow while maintaining seal flow > 6 gpm, Regenerative Hx temp. 380 degrees and PZR level at program. • Place 1NV-124 in auto	1NV-7B will not have power. Position will be determined using OAC
	BOP	When PZR level matches program level • Place 1NV-238 to auto • Adjust seal flow to 8 gpm	
	SRO	Notify Chemistry normal letdown is in service	
	BOP	Check 1NV-127 aligned to Demin	Select Demin if required
	BOP	Operate PZR heaters as required	
	SRO	When time allows notify Engineering to document transients	
	SRO	Return to procedure and step in effect	AP-7 Step 29
		At this time an oil leak develops on 1B FWPT	

Event 6: *Trip of 1B FWPT due to oil leak – Failure of Turbine to Runback*

Time	Pos.	Expected Actions/ Behavior	Comments
	CREW	Recognizes oil leak on 1B FWPT	CUE: NLO at FWPT reports oil is spraying everywhere
	SRO	May decide to reduce load per AP-4 in an attempt to get power low enough to secure the FWPT, or he may decide to trip the FWPT and go to AP-3	If crew does not trip the 1B FWPT then it will be tripped to get them in a runback
	CREW	Recognizes trip of 1B FWPT and Load Rejection	
	SRO	Enters AP-03 Load Rejection	
	RO	Ensures Control Rods in Auto	*This is an immediate action step.*
	RO	Check Turbine Generator Tied to Grid and output going down.	RO will take Turbine to manual and reduce impulse pressure to 400-410 psig in fast action
	RO	Checks Control rods moving in as required & aligned with associated bank.	
	BOP	Checks proper CM system operation: • Standby Hotwell and Condensate Booster pumps RUNNING • 1CM-420 - OPEN	BOP Should start pumps and check manual loader OPEN
	RO	Ensures impulse pressure decreasing to < 410 psig	
	RO	Check P/R meters less than 20%	No
	SRO	Designates an operator to continuously monitor reactor power and go to step 9.	
	RO	Checks condenser dump valves modulating open	
	RO	Checks load rejection – due to loss of CF pump	
		At this time 1A FWPT will trip and initiate an ATWS	

Event 7: ATWS with a loss of Heat Sink

	Pos.	Expected Actions/ Behavior	Comments
	Crew	Recognizes ATWS	
	SRO	Goes to E-0	
	RO	Checks Reactor trip: • All rod bottom lights LIT • Reactor trip and bypass breakers OPEN • I/R amps – Going Down	RO should attempt to trip reactor using switches and will realize the turbine has not tripped and should trip the turbine.
	SRO	Recognizes reactor did not trip and implements F-0 and goes to FR-S.1	
Critical	RO	Checks Reactor trip: • All rod bottom lights LIT • Reactor trip and bypass breakers OPEN I/R amps – Going Down	Manually inserts rods
	RO	Checks turbine trip: • All throttle valves closed • All governor valves closed	Manually trips turbine if not already done.
	Crew	Monitors fold out page	
	BOP	Checks proper CA pump status: • MD CA pumps – ON • Check N/R level in at least 3 S/Gs greater than 17%	1A Tagged out 1B no power 1ETB deenergized TD CA tripped on over speed
	BOP	Initiates emergency boration of NC system: • Ensures one NV pumps ON • Opens 1NV-265B • Starts both boric acid transfer pumps • Checks emergency boration flow > 30 gpm • Checks 1NV-244A and 1NV-245B OPEN • Checks Pzr pressure < 2335 psig	1NV-265B no power Will have to align NV pump suction to the FWST 1NV-245B position will be verified using OAC
	BOP	Close 1VQ-1A,1VQ-6A,1VQ-2B & 1VQ-5B	

	Pos.	Expected Actions/ Behavior	Comments
	SRO	If an S/I signal exists or occurs perform Encl. 3	
	SRO	Checks the following trips have occurred: • Reactor trip • *Turbine trip*	Dispatches operator to open: • Reactor trip breakers • Reactor trip bypass breakers • M/G Set Generator Breakers • M/G set Motor Breakers
	RO	Controls S/G levels: • Checks NR level in at least one S/G > 11% • Checks VI header pressure > 60 psig • Throttles feed flow to maintain S/G NR level between 11% and 50%	If CA flow is less than 700 gpm, then start pumps and align valves as required. Maintain total CA flow greater than 700 gpm until at least on S/G NR level greater than 11%
	BOP	Checks all dilution paths ISOLATED • Places NC System M/U controller to OFF • *Places Reactor Makeup water pumps to* STOP	
	RO	Checks steam lines intact: • All S/G pressures – Stable or Going *UP* • All S/G pressurized	If any S/G depressurized or pressure going down in an uncontrolled manner ensure the following closed: • All MSIVs • All MSIV bypass valves
	BOP	Checks NC T-colds – Stable or Going UP	
	RO	Checks Core Exit T/Cs < 1200 degrees	
	SRO	Checks the reactor subcritical: • P/R channels < 5% • *I/R SUR* – NEGATIVE • W/R Neutron Flux < 5%	Yes
	SRO	Calls chemistry to obtain current boron concentration	
	SRO	Refers to RP/000 Classification of Emergency	
	SRO	Return to procedure and step in effect.	Due to RED Path on Heat Sink goes to H-1.
	SRO	Goes to FR-H.1	
	Crew	Determines feed flow is less than 450 gpm but not due to operator action	

Time	Pos.	Expected Actions/Behavior	Comments
	SRO	Checks to see if heat sink is required: • NC Pressure > greater than any non-faulted S/G pressure • Any NC T-hot – greater than 350 degrees	Yes
	Crew	Monitor foldout page	At this point in the scenario Feed and Bleed criteria may be met.
	SRO	IF Feed and Bleed Criteria met go to step 20	
	SRO	Perform steps 21-25 quickly to establish Feed and Bleed	
	BOP	Ensure NC pumps off	
	BOP	Initiate S/I	
	BOP	Check NV pumps to cold legs indicating flow	
	BOP	Establish NC System Bleed path by opening 2 PZR PORV with open Isolation valves.	
	BOP	Close 1NV-151A and 1NV-150B	1NV-150B is deenergized
	BOP	Secure PZR Heaters	
	BOP	Perform Encl. 9 (Subsequent S/I Actions)	
	CREW	*Maintain S/I Flow and 2 PZR PORVs Open*	
	RO	Reset S/I and Sequencers	
	CREW	Restart S/I equipment on a BO	
	SRO	Check Containment pressure less than 3 psig	
	BOP	Establish VI to containment	
	SRO	Dispatch operators to stop NF AHU and place H2 Analyzers in service go to step 34	
	SRO	Check NS pumps off and go to step 35	
	RO	Reset CA modulating valves and close CA flow control valves	
	SRO	Attempt to establish Heat Sink With CA. Go to Step 7	
	RO	Attempt to establish CA flow	1A CA tagged (oil sample) have WCC *clear tagout* 1B CA no power TDCA (1SA-3 Is closed, linkage is broken)
	SRO	Contact WCC SRO to clear tagout on 1A CA pump and send operator to TDCA pump to reset 1SA-3	
	SRO	Continue on with FR-S.1 and attempt to establish a heat sink with CM	

Time	Pos.	Expected Actions/ Behavior	Comments
	SRO	WCC informs that 1A CA pump is available	
	SRO	Returns to step 7 in FR-H.1	
	SRO	Attempt to establish CA flow to at least one S/G	
	RO	Check Power to both motor driven CA pumps	1A CA has power
	BOP	Check that CA valves have been aligned per Encl. 4	
	RO	Start 1A CA pump	
	RO	Check TD CA running	NO
	RO	Check total CA flow >450 gpm	
	SRO	A CA pump running and step 35 has been implemented .Go to Step 7h	
	RO	Check any S/G less than 12% WR	At this point in scenario there should be a S/G with less than 12% WR
	RO	Check core exit T/C stable or going down	At this point in scenario core exit T/C may be going up.
	SRO	Will direct RO to open CA control Valve to either A or B S/G (which ever had the highest level) to establish flow rate required to lower core exit T/C	
Terminate Scenario When Feed Flow has been established to one S/G			

Note to Examiner: Be sure SRO classifies event at end of scenario.

Classification of Event: General Emergency due to:

1) **Valid reactor trip signal received or required and automatic trip was not successful.**

AND

2) **Manual reactor trip from the control room was not successful in reducing reactor power to less than 5% and decreasing.**

AND

3) **Heat Sink CSF-RED**

SHIFT TURNOVER INFORMATION

UNIT 1 STATUS:

Power Level: 100% NCS [B] 953 ppm Pzr [B]: 953 ppm Xe: 2895pcm

Power History: At this power since startup Core Burnup: 350 EFPDs

CONTROLLING PROCEDURE: OP/1/A/6100/03 Controlling Procedure for Unit Operation

OTHER INFORMATION NEEDED TO ASSUME TO SHIFT:

"1A" Diesel Generator tagged for PM.
"1A" Motor Driven Auxiliary Feedwater Pump tagged for oil sample.
Unit 2 is available for Auxiliary Steam
PT/1/B/4250/028 Main Turbine Bearing Oil Pump Test is scheduled to be performed
Vibration readings are not required for PT/1/B/4250/028

Work Control SRO/Offsite Communicator **Tim**

Plant SRO **Gary**

NLO's AVAILABLE

Unit 1	**Unit 2**
Aux Bldg. Missy	**Aux Bldg. Warren**
Turb Bldg. Al	**Turb Bldg. Greg**
5th Rounds. Tom	
Extra(s) Richard, Andy	

Facility: McGuire Scenario No.: 2 Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 35% Power, 'B' Train Components in Service, '1A' Auxiliary Feedwater Pump is tagged, '1A" Diesel Generator is tagged, thunderstorms are in the area

Turnover: Remove FWPT from Service

Event No.	Malf. No.	Event Type*	Event Description
1		N	(RO) Remove FWPT from Service
2		C	(RO) 1CF-20 Feed Regulating Valve Fails OPEN
3		I	(BOP) Pressurizer Pressure Channel 1 Fails HIGH with Spray Valve Failure
4		C	(BOP) 1RN-187B Fails Closed – Loss of RN to KC
5		C	(RO) 1SB-12 Condenser Dump Fails OPEN
6		C	(BOP) 1KC-132 Erratic – Letdown Heat Exchanger Valve
7		M	SGTR with LOOP
			Failure of FWI, 2 rods fail to insert, Phase 'A' Train 'A' failure
			No Auto SI

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

PROGRAM: McGuire Operations Training

MODULE: Initial License Operator Training Class 21

TOPIC: Nuclear Regulatory Commission Simulator Exam

Scenario 2

REFERENCES:

1.	McGuire Technical Specifications	
2.	OP/1/A/6100/003	Controlling Procedure for Unit Operation
3.	AP/1/A/5500/01	Steam Leak
4.	AP/1/A/5500/06	S/G Feedwater Malfunction
5.	AP/1/A/5500/11	Pressuizer Pressure Anomalies
6.	AP/1/A/5500/20	Loss of RN
7.	EP/1/A/5000/E-0	Reactor Trip or Safety Injection
8.	EP/1/A/5000/E-3	Steam Generator Tube rupture
9.	RP/O/A/5700/000	Classification of Emergency

Author:
Facility Review:

April 3, 2003
Rev.1

EVENT SUMMARY

1. Remove from service one FWPT per OP/1/A/6100/003.
2. 1CF-20 (C S/G FRV) fails open. Enter AP-6
3. Pressurizer Pressure Channel 1 fails High. 1NC-27 fails open. Enter AP-11
4. 1RN-187B closes, Loss of RN to operating KC Hx. Enter AP-20
5. 1SB-3 (Condenser Dump Valve) fails open. Enter AP-1
6. 1KC-132 fails closed in Auto.
7. SGTR. Enter AP-10
8. Manual Rx Trip and SI. Enter E-0
9. Implement F-0 and Go to E-3 from E-0 step 21
10. LOOP

—	Bench Mark	ACTIVITY	DESCRIPTION
☐	Sim. Setup	**Rod Step On**	
☐		**IC - 131**	
☐		**RUN**	
☐		***Update*** *Status Board,* **Setup OAC** **Setup** ICCM, Turbine *Displays, & Trend* Recorders. **Check** Rod Step Counters agree with rod positions	*See Shift Turnover Information*
☐		**(M) EPQ001A** **Set = 1**	Loss of D/G "1A" Control Power
☐		**(LOA) CA009** **Set = F**	Rack out breaker for "1A" Auxiliary Feedwater Pump
☐		**(M) IPE001A** **(M) IPE001B**	Defeats automatic reactor trips
☐		**(M) ISE003A**	Phase A Train A isolation fails to actuate automatically
☐		**(M) ISE007A** **(M) ISE007B**	FWI train A fails to actuate automatically FWI Train B fails to actuate automatically
☐		**(M) IRE010B8** **(M) IRE010F2**	Control Rod B8 stuck Control Rod F2 stuck

	Bench Mark	ACTIVITY	DESCRIPTION
☐		**(M) EMF171** **(M) EMF174** **Set as is**	EMF-71 fails as is EMF-74 fails as is
☐		**(M) ISE002A** **(M) ISE002B**	Failure of automatic Safety Injection – both trains
☐		**Freeze.**	
☐		**Update Fresh Tech. Spec. Log.**	
☐		**Fill out the NLO's Available section of Shift Turnover Info.**	
☐	Prior to Crew Briefing	**RUN**	
☐	**Crew Briefing** 1. Assign Crew Positions based on evaluation requirements 2. Review the Shift Turnover Information with the crew. 3. Direct the crew to Review the Control Boards taking note of present conditions, alarms.		
☐	T-0	Begin Familiarization Period	
☐	At direction of examiner	**(M) IFE006C** **Set 100, Ramp 20**	Fails 1CF-20 (C S/g FRV) open
☐	At direction of examiner	**(XMT) NC038** **Set 2500, Ramp 5** **Trigger 1**	Fails PZR Pressure Channel 1 HIGH
☐	At direction of examiner	**(M) ILE003A** **Set 100** **Trigger 1**	Fails 1 NC-27 open

	Bench Mark	ACTIVITY	DESCRIPTION
☐	At direction of examiner	**(M) RN005E** **Set 0, Ramp 60**	Fails 1RN-187 Closed
☐	At direction of examiner	**(M) IDE003A** **Set 100, Ramp 10**	Fails open 1SB-3
☐	At direction of examiner	**(OVR) NV086B** **Set 100, Ramp 300**	Fails 1KC-132 closed
☐	At direction of examiner	**(MAL) SG001A** **Set 450, Ramp 300**	Tube leak 1A S/G
☐	At direction of examiner	**(M) EP001**	LOOP
☐	**Terminate the scenario upon direction of Chief Examiner**		

EVENT 1: Remove from service one FWPT per OP/1/A/6100//003

Time	Pos.	Expected Actions/ Behavior	Comments
	SRO	Conduct a prejob brief	Prejob brief will be conducted prior to taking turnover.
	RO	Ensure AMSAC actuation is blocked	
	RO	Place FWPT's to Manual	
	RO	Raise speed on FWPT to remain in service until an increase is seen in • CF suction flow • CF header pressure • CF Hdr Press/ SM Hdr Press D/P • Turbine RPM	
	RO	Lower speed on FWPT to be removed from service and raise speed on FWPT to remain in service while maintaining constant • CF header pressure • CF header flow • CF Hdr Press/SM Hdr Press D/p	
	RO	S/D FWPT removed from service using OP/1/A/6250/001	
	RO	Reduce speed of FWPT to be S/D to minimum	
	RO	Verify CF pump Recirc is open	
	RO	Trip FWPT by holding Rest On Recirc valve closure circuit than trip FWPT	
	RO	Place FWPT in service in auto • Calculate program D/P • Adjust FWPT to obtain program D/P • Place FWPT in auto	

Event 2: 1CF-20 fails open

Time	Pos.	Expected Actions/ Behavior	Comments
	BOP	Refer to annunciator responses • A-3 • C-3	Per annunciator response and AP/06 the operator will swap failed channel to operable channel
	SRO	Enters AP/06 S/G Feedwater Malfunction	
	RO	Places Feed Regulator to Manual Restores S/G level to program level	*Immediate Action*
	RO	Checks the following channel indicating the same: • Feed flow • Steam Flow • S/G Level	*Immediate Action*
	RO	Checks the reactor trip breakers closed > P-11	Yes
	RO	Monitor S/G NR Level	If at any time S/G NR Level approaches 17% or 83%, then trip Reactor
	BOP	Check CM/CF feeding S/G	
	RO	S/G level stable or trending to program	
	BOP	Checks NC temperature with NC pumps on stable or trending to programmed temperature	
	RO	When the following are met then return affected S/G CF control to automatic 1. Selected control channels indicated correctly • Feed flow • Steam flow • S/G level 2. Affected S/G level restored to program level 3. Automatic control is desired	*Automatic will not operate*
	RO	Checks proper CF alignment	
	SRO	Checks procedure enter due to automatic control of 1CF-20 failing	
	SRO	Contacts WCC to write WR, have I&E repair failed valve and evaluate T.S. Exit procedure	**Failure will not be repaired**

Event 3: *Pressurizer Pressure Channel 1 Failure* ***HIGH*** *with 1NC-27 failed open*

Time	Pos.	Expected Actions/ Behavior	Comments
	BOP	Recognizes/reports PZR pressure decreasing	
	SRO	Implements AP/11 Pzr Pressure Anomalies,	
	BOP	Checks Pzr Pressure decreasing	*Immediate action* Yes
	BOP	Checks all channels the same	*Immediate Action* No Places PZR Press Cntrl Select to back up channel
	BOP	Checks Pzr PORV's Closed	*Immediate action* Yes
	BOP	Checks Spray Valves Closed	*Immediate action* 1NC-27 open takes controller to manual and closes valve
	BOP	Checks Pzr PORV's - closed	
	BOP	Checks Spray Valves Closed	
	SRO	Go to Step 9	
	BOP	Checks NV-21A , CLOSED	
	BOP	Checks Pzr A,B & D heaters ON	• Place Pzr heaters mode select switch in manual • Turn on heaters as necessary to control pressure.
	BOP	Checks 1C PZR heater - ON	If pressure below desired pressure, then: • Place "Pzr PRESS MASTER" in manual • Control Pressure • When Pzr pressure return to normal and automatic control is desired the place Pzr master in auto.
	BOP	Checks Pzr pressure going UP	
	SRO	Go to step 22	
	SRO	Ensures "Pzr PRESS REC SELECT" is on an operable channel	
	SRO	Will notify WCC to write WR, have I&E investigate and repair and evaluate T.S.	**Failure will not be fixed** **T.S.: 3.3.1.6 / 3.3.1.8.a / 3.3.1.8.b / 3.3.2.1.d / 3.3.2.3.a.3 / 3.3.2.5.c / 3.3.2.6.c / 3.3.2.8.b / 3.3.4.2 / 3.3.6.3 / 3.4.1 / 3.4.11**

Event 4: *1RN-187B (RN to KC Heat Exchanger) Fails* ***CLOSED***

Time	Pos.	Expected Actions/ Behavior	Comments
	BOP	Recognizes loss of RN flow to KC HX	
	SRO	Go to AP-20 Loss of Operating RN Train – Case 1	
	BOP	Checks for potential loss of LLI • Check Unit 2 RN pumps that are aligned to LLI- operating properly • Check suction flow path - available	**EXAMINER CUE:** **Unit 2 RN pumps are operating properly**
	BOP	Checks idle train available to start To start 1A RN pump performs the following *Places manual loader for 1RN-89A to 10% OPEN* Starts 1A RN Pump Ensures 1RN-86A OPEN	
	SRO	*Go to step 4*	Enclosures for local venting of RN pumps and NV Pump cooling via gravity drain have not been performed.
	BOP	Check 1A KC pumps on	No
	BOP	Check 1B KC pumps on	Yes
	BOP	Ensure 1KC-228B and 1KC-18B open Ensure 1KC-230A and 1KC-3A closed	
	BOP	Checks 1B RN pump running properly	If BOP answers no, he will place 1RN-187 in manual and open (the *malfunction will prevent from opening*). He will then be directed to secure the 1B RN pump. The SRO will then go to step 5 If the BOP answers yes, the SRO will go to step 5
	BOP	Throttles 1RN-89A to establish desired flow while maintaining less than 16,000 gpm	
	SRO	Investigate reason for loss of RN train	
	SRO	Ensure CR Area Chiller in Service per Encl.3.	Request Unit 2 RO to perform
	SRO	Swap operating equipment cooled by affected train of RN to opposite train	

Time	Pos.	Expected Actions/ Behavior	Comments
	BOP	Swaps trains of KC per Enclosure 2 • Limits KC flow to 4000 gpm per operating KC pump • Checks the following open: 1. 1RN-40A 2. 1RN-41B 3. 1RN-43A 4. Any KC pump running • Checks both ND pumps OFF • Go to Step 19 • Ensures 1RN-187B select switch is in manual • Throttle open 1RN-89A to establish desired flow to 1A KC HX maintain less than 16,000 gpm • Places 1KC-51A in the "AUTO" position • Ensure 1KC-51A opens/cycles • Starts 1A1 and 1A2 KC pumps • Aligns Reactor Bldg header to 1A train as follows: 1. Open 1KC-3A 2. Open 1KC-230A 3. Close 1KKC-228B 4. Close 1KC-18B • Checks both ND pumps OFF • Places 1RN-187B Mode Select switch to Auto • Check close 1RN-187B • Places control switch for 1KC-54B to close position Stops 1B1 and 1B2 KC pumps Stops 1B1 and 1B2 KC pumps	
	BOP	Swaps trains of NV per OP/1/A/6200/001B Enclosure 4.2	Move to next event during swap of NV trains

Event 5: 1SB-3 (Condenser Dump Valve) Fails **OPEN**

Time	Pos.	Expected Actions/ Behavior	Comments
	CREW	Recognizes symptoms of a steam leak • T-ave decreasing • Power increasing	T-ave-Tref annunicator may come in alarm
	SRO	Enters AP-01 Steam Leak	
	Crew	Monitors fold out page	
	RO	Reduces turbine load to maintain: • Excore NI – less than 100% • NC loop D/Ts - less than 60 degrees • T-ave at T-ref	
	BOP	Checks Pzr level – at or going to programmed level	
	SRO	Will return to step 3 if Pzr level can not be maintained.	
	RO	Announces occurrence on page	
	RO	Identifies and isolates leak: • Checks S/G PORVs – CLOSED • Checks condenser dump valves – 1 OPEN • Checks containment conditions – NORMAL • Checks turbine driven CA pump – OFF • Checks steam line drain valves – CLOSED • Checks Unit 2 – steam header pressure	A condenser dump valve will be OPEN – RO must select "OFF RESET" on Steam dump interlock Bypass channel A and B. Due to failure valve will not close. SRO will call WCC to have valve isolated locally.
	SRO	Exits procedure when leak is isolated.	

Event 6: 1KC-132 fails **Closed**

Time	Pos.	Expected Actions/ Behavior	Comments
	BOP	Acknowledges L/D heat exchanger Outlet High Temp Annunciator	Takes action per ARP
	BOP	Takes manual control of 1KC132. Opens valve, lowers L/D Hx outlet temperature.	
	SRO	Calls WCC to have WR written and Have I&E investigate and repair.	

Event 7: SGTR on "A" S/G

Time	Pos.	Expected Actions/ Behavior	Comments
	Crew	Recognizes symptoms of SGTR	
	SRO	Enters AP-10 Case 1	
	RO	Checks PZR level Stable or going up	
	BOP	Performs the following • Charging flow <175 gpm • Ensures 1NV-238 opening • Open 1NV-241 maintain 6 gpm seal flow • Isolate letdown • Start 1A NV pump	
	SRO	IF PZR level going down with max Charging flow Direct Tripping of Reactor and ensure S/I initiated.	

Event 7: SGTR on "A" S/G E-0 Evaluation

Time	Pos.	Expected Actions/ Behavior	Comments
	SRO	Enters E-0	
	Crew	Monitors Foldout page	
	RO	Check Reactor Trip: • rod bottom lights • reactor trip breakers open • I/R amps decreasing	*Immediate action* All rod bottom lights will not be lit due to 2 rods being stuck out. Per RNO RO will trip Reactor and SRO and RO should determine the Reactor is tripped.
	RO	Check Turbine Generator tripped • TV's closed	*Immediate action*
	BOP	Check ETA and ETB energized	*Immediate action*
	RO	Check SI status light - LIT	*Immediate action*
	BOP	Check LOCA sequencers (A & B) actuated	*Immediate action*
	SRO/ RO	Announce "Unit 1 Safety Injection" on page	
	BOP	Checks ESF Monitor Light Panel • Groups 1,2 and 5 DARK • Group 3 LIT • Checks OAC in service	
	BOP	Checks Group 4, Rows A thru F LIT as Required	Auto actuation of Phase A is blocked BOP will • ensure both trains Phase A Isolation are initiated • Align or start S/I and Phase A components with individual windows in Group 4 as required.
	BOP	Check the following on Monitor Light Panel Group 4 LIT • C-3 • C-6 • F-4 • F-5	Auto Action of FWI is blocked BOP will • Check OAC Monitor Light Program for associated light • Align valves as required while SRO continues on with the procedure.
	RO	Checks CA is running and at least 3 S/G's NR level > 17%	

Time	Pos.	Expected Actions/ Behavior	Comments
	BOP	Checks KC pumps running	
	BOP	Checks RN pumps running	
	SRO	Directs Unit 2 Operator to throttle RN to minimum & start 2A RN pump	**EXAMINER CUE:** • 2A RN pump is running
	RO	Checks all S/G pressures > 775 psig	
	BOP	Checks Containment pressure has remained less than 3 psig	
	BOP	Checks NV Pump to Cold Leg Flow gauge - indicating flow - YES checks NC pressure < 1600 psig	BOP will ensure ND pump mini-flow valves are open
	SRO	When available notifies OSM or other SRO to implement Generic Enclosure 21	**EXAMINER CUE:** **OSM will ensure Generic Enclosure 21 implemented.**
	RO	• Checks CA flow > 450 gpm and takes control of CA to maintain no load levels • checks VI header pressure > 60 psig • Maintains N/R level between 11% and 50%	
	BOP	Checks NC pumps ON and Tave stable or trending to 557 degrees	If not stable and decreasing crew will go to Enclosure 3
	BOP	Checks Pzr PORV & Spray Valves closed	
	RO	Checks subcooling > 0 deg.	
	RO	Checks all main steam lines INTACT	
	RO/ BOP	Report S/G tube rupture parameters indicate that S/G tubes NOT intact	PER RNO Implement F-0 and Go to E-3
	SRO	Implement CSF Status Trees and go to E-3	

Event: STGR on "A" S/G E-3 Evaluation

Time	Pos.	Expected Actions/ Behavior	Comments
	SRO	Enter E-3	
	CREW	Monitor foldout page	
	RO/ BOP	Identify "A" as the ruptured S/G	
	RO	Check at least one S/G - AVAILABLE FOR NC SYSTEM COOLDOWN	
	RO	Isolate steam flow from ruptured S/Gs as follows: • checks ruptured S/G PORV closed • check S/G 1B and 1C INTACT • check 1BB-1B and 1BB-5A Closed • close 1SM-83	
	RO	Close the following on ruptured S/Gs: • MSIV • MSIV bypass valve	
	RO	Checks ruptured S/G NR levels greater than 11% Isolates feed flow to "A" S/G • Close 1CA-66A • Close 1CA-62A	
	BOP	Checks Pzr PORV and isolation valves: • Power to all Pzr PORVs available • All Pzr PORVs CLOSED • At least one Pzr PORV isolation valve OPEN	
	RO	Checks main stream lines intact: • All S/G pressures stable or going up • All S/G pressurized	
	BOP	Reset the following: • S/I • Sequencers • Phase A isolation • Phase B isolation	
	BOP	Established VI to containment • 1VI-129B open • 1VI-160B open • 1VI-150B open • Checks VI header pressure > 85 psig.	
	RO	Controls intact S/G levels: • N/R level in all intact S/Gs > 11% • Throttles feed flow to maintain intact S/Gs N/R levels between 22% and 50%	
	BOP	Checks 1ETA and 1ETB energized by offsite power	
	SRO	Checks ruptured S/G identified	

Time	Pos.	Expected Actions/ Behavior	Comments
	RO	Checks the following closed on ruptured S/G: • MSIV • MSIV bypass valve	
	RO	Checks ruptured S/G pressure greater than 280 psig.	
	BOP	Checks any NC pump running	
	BOP	When P-11 status light lit then block steamline isolation and maintains NC pressure less than 1955 psig.	
	RO	Initiate a NC system cooldown as follows: Determine required core exit temperature based on lowest ruptured S/G pressure. Check Condenser available • COND AVAILABLE FOR STEAM DUMP" status light – LIT • MSIV on intact S/Gs OPEN Place Steam Dumps in steam pressure mode. When P-12 stat light lit place steam dumps in bypass interlock. Dump steam to condenser at max rate.	Once the RO has initiated a cooldown a LOOP will occur.
	CREW	Recognizes the LOOP B D/G starts and energizes ETB. ETA is deenergized due to 1A D/G tagged. Restarts S/I equipment previously on.	
	SRO	Recognizes NCPs are off and loss of condenser Vacuum. Returns to Step 15 in E-3	
	BOP	Checks any NC pump running	
	BOP	When P-11 status light lit then block steamline isolation and maintains NC pressure less than 1955 psig.	

Time	Pos.	Expected Actions/ Behavior	Comments
	RO & BOP	Initiate a NC system cooldown as follows: Determine required core exit temperature based on lowest ruptured S/G pressure. Check: • COND AVAILABLE FOR STEAM DUMP" status light – LIT • MSIV on intact S/Gs OPEN 1. If Pzr pressure is greater than 1955 psig, then depressurize to 1900 psig using Pzr PORV. 2. Depress "BLOCK" on low pressure steam line isolation block switches 3. Maintain NC pressure less than 1955 psig. 4. Ensure Main Steam Isolation reset. 5. Ensure S/G PORVs reset. 6. Dump steam using all intact S/Gs PORVs at maximum rate as follows: • Close S/G PORV manual loader on ruptured S/G • Place intact S/G PORV manual loaders at 50% • Select "MANUAL" on "SM PORV MODE SELECT" • Adjust manual loader on intact S/G PORVs as required to control intact S/G depressurization rate at approximately 2 psig per second. Check low pressure steamline isolation – BLOCKED Check core exit T/Cs – less than required temperature. Stop NC system coodown Maintain core exit T/Cs less than required temperature.	
	RO	Checks ruptured S/G pressure – stable or going up	
	SRO	Checks NC subcooling based on core exit T/Cs > than 20 degrees	
	BOP	Depressurizes the NC system 1. Checks ruptured S/G NR level less than 73% 2. Checks normal Pzr spray available	Observe caution prior to step 21 and go to step 21
	BOP	Depressurize NC system using one PZR PORV	

Time	Pos.	Expected Actions/ Behavior	Comments
	BOP	Close PZR PORV when one of the following is satisfied • NC Subcooling < 0 • PZR level >76% • NC pressure < ruptured S/G pressure & PZR level > 11%	
	BOP	Check NC System Pressure going up	
	Crew	Checks for S/I termination criteria 1. NC subcooling greater than 0 degrees 2. Secondary heat sink 3. NC pressure – stable or going up 4. Pzr level greater than 11%	Must meet all criteria to terminate.
	BOP	Stop NI pumps and one NV pump	
	BOP	Check NV pump suction aligned to FWST Open 1NV-150B & 1NV-151A Close 1NI-9A &1NI-10B	
Terminate Scenario			

Note to Examiner: Be sure SRO classifies event at end of scenario.

Classification of Event: Site Area Emergency due to:

1) **Release of Secondary side to atmosphere with primary to secondary leakage > Tech Spec allowable.**

AND

2) **Primary- to- Secondary leak rate exceeds the capacity of one charging pump in the normal charging mode with letdown isolated.**

SHIFT TURNOVER INFORMATION

UNIT 1 STATUS:

Power Level: 40% NCS [B] 13 ppm Pzr [B]: 13 ppm Xe: 2895pcm

Power History: At this power for 400 days Core Burnup: 440 EFPDs

CONTROLLING PROCEDURE: OP/1/A/6100/03 Controlling Procedure for Unit Operation

OTHER INFORMATION NEEDED TO ASSUME TO SHIFT:

"1A" Diesel Generator tagged for PM.
"1A" *Motor Driven Auxiliary Feedwater Pump* tagged for PM
Unit 2 is available for Auxiliary Steam
Remove 1B FWPT from service and Shutdown per OP/1/A/6100/003 Encl. 4.2 Step 3.6.13 to repair oil leak.

Work Control SRO/Offsite Communicator **Tim**

Plant SRO **Gary**

NLO's AVAILABLE

Unit 1	Unit 2
Aux Bldg. Missy	**Aux Bldg. Warren**
Turb Bldg. Al	**Turb Bldg. Greg**
5TH Rounds. Tom	
Extra(s) Richard, Andy	

Facility: McGuire Scenario No.: Spare Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 100% Power, 'B' Train Components in Service, '1A' Auxiliary Feedwater Pump is tagged, '1A" Diesel Generator is tagged, thunderstorms are in the area

Turnover: Reduce Turbine Load to 90% to Perform Turbine Valve Movement Test

Event No.	Malf. No.	Event Type*	Event Description
1		N	(RO) Reduce Turbine Load
2		I	(BOP) Tcold Failure HIGH
3		I	(RO) S/G 'A' Narrow Range Level Fails LOW
4		C	(RO) Power Range N-42 Fails HIGH
5		C	(BOP) Pressurizer Level Master Failure
6		C	(BOP) NC System Leak 50 gpm
7		M	Rod Ejection
			.
			No Auto SI, Phase 'B' Train 'A' Fails to Actuate in Automatic

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

PROGRAM: McGuire Operations Training

MODULE: Initial License Operator Training Class 21

TOPIC: Nuclear Regulatory Commission Simulator Exam

Scenario Spare

REFERENCES:

1. McGuire Technical Specifications
2. OP/1/A/6100/003 Controlling Procedure For Unit Operation
3. AP/1/A/5500/06 S/G Feedwater Malfunction
4. AP/1/A/5500/10 NC System Leakage within Capacity of Both NV Pumps
5. AP/1/A/5500/14 Rod Control Malfunction
6. AP/1/A/5500/16 Malfunction of Nuclear Instrumentation
7. EP/1/A/5000/E0 Reactor Trip or Safety Injection
8. RP/O/A/5700/00 Classification of Emergency

Author: _____

Facility Review: _____

April 3, 2003
Rev.1

EVENT SUMMARY

1. Reduce power in preparation for Turbine Valve Movement Test.
2. B NC loop T Cold fails High. Enter AP-14
3. D S/G NR Level Channel 1 fails Low. Enter AP-6
4. PR-42 fails. Enter AP-16
5. PZR Level Master fails
6. NC System Leak. Enter AP-10
7. Rods Ejection 2000 gpm NC system leak. Enter E-0

—	Bench Mark	ACTIVITY	DESCRIPTION
☐	Sim. Setup	**Rod Step On**	
☐		**IC - 127**	
☐		**RUN**	
☐		**Update** Status Board, **Setup OAC** **Setup** ICCM, Turbine Displays, & Trend Recorders. **Check** Rod Step Counters agree with rod positions	See Shift Turnover Information
☐		**(M) EPQ001A** **Set = 1**	Loss of D/G "1A" Control Power
☐		**(LOA) CA009** **Set = F**	Rack out breaker for "1A" Auxiliary Feedwater Pump
☐		**(M) IPE001A** **(M) IPE001B**	Defeats automatic reactor trips
☐		**(M) DEH003A**	Failure of Auto Turbine tripped blocked
☐		**(M) ISE003B** **Sel + BLK Auto**	Failure of Phase "A" train "B" to actuate automatically

	Bench Mark	ACTIVITY	DESCRIPTION
		(M) ISE002A **(M) ISE002B**	Failure of automatic Safety Injection – both trains
☐		**Freeze.**	
☐		**Update Fresh Tech. Spec. Log.**	
☐		**Fill out the NLO's Available section of Shift Turnover Info.**	
☐	Prior to Crew Briefing	**RUN**	
☐	**Crew Briefing** 1. Assign Crew Positions based on evaluation requirements 2. Review the Shift Turnover Information with the crew. 3. Direct the crew to Review the Control Boards taking note of present conditions, alarms.		
☐	T-0	Begin Familiarization Period	
☐	At direction of examiner	**(XMT) NC102** **Set = 630, Ramp = 10**	B NC Loop T-Cold fails **High**
☐	At direction of examiner	**(XMT) CF008** **Set = 0, Ramp 10**	"A" S/G N/R Level Channel 1 fails **Low**
☐	At direction of examiner	**(M) ENB013D** **Set =200, Ramp = 10**	Power Range N-42 fails **High**
☐	At direction of examiner	**(OVR) NC111** **Set =100, Ramp = 60**	PZR Level Master fails **High**
☐	At direction of examiner	**(M) NC007A** **Set = .25, Ramp = 300**	NC System leak **50 gpm**
☐	At direction of examiner	**(M) NC005** **Set = 2000**	Ejected rod M8. Leak rate increases to **2000 gpm**
☐	**Terminate the scenario upon direction of Chief Examiner**		

Event 1: Reduce Load per OP/1/A/6100/003 Step 3.2

Time	Pos.	Expected Actions/ Behavior	Comments
	SRO	Notify SOC	
	RO	Check quality Thermal power best OAC points	
	BOP	Operate PZR Heaters per OP/1/A6100/003 Encl.4.3	
	RO	Reduce Turbine load per OP/1/A/6300/001 A (Turbine Generator Load Change)	
	CREW	Maintain Control Rods within insertion and withdrawal limits per COLR	
	CREW	Maintain AFD within Target Band	
	RO	At 98% power Place MW Loop in service	

Event 2: B NC Loop T Cold fails **High**

Time	Pos.	Expected Actions/ Behavior	Comments
	RO	Recognizes Unwarranted Control Rod Insertion and informs Crew.	Annunciator AD-6 B -10 T-ref/T-auct Abnormal
	SRO	Enters AP-14. Stops load decrease	
	RO	If more than one rod dropped – trip Rx	*Immediate action*
	RO	Places CRD Bank Selector Switch to manual and verifies movement stopped	*Immediate action*
	RO	Check all control banks aligned with associated bank	
	RO	Checks Rod Control Urgent Failure alarm DARK	
	RO	Checks to following reactor control instruments NORMAL • Turb Imp Press Ch 1 • T-ref indication • "1A" NC loop T-ave • "1B" NC loop T-ave • "1C" NC loop T-ave • "1D" NC loop T-ave	Loop "B" T-ave identified Go to Enclosure 4
	SRO	Goes to Enclosure 4	
	BOP	Announce occurrence on page	
	CREW	Evaluates the following prior to any control rod withdrawal: • Ensures no inadvertent mode change will occur. • Ensures rods are withdrawn in a deliberate manner.	
	RO	Checks the following normal: • Turb Imp Press Ch 1 • T-ref indication	
	RO	Checks the following normal: • "1A" NC loop T-ave • "1B" NC loop T-ave • "1C" NC loop T-ave • "1D" NC loop T-ave	Loop "B" Tave identified BOP will perform the following: • Places D/T Defeat switch to failed loop • Places T-ave Defeat switch to failed loop RO will perform the following as necessary to maintain T-ave at T-ref: • Position control rods in manual • Borate/Dilute NC system • Adjust turbine load When T-ave at T-ref +/- 1 degree and auto rod control is desired, then return rod control to auto. • Ensure P-12 is in required state for existing plant conditions

Time	Pos.	Expected Actions/ Behavior	Comments
	SRO	Instructs IAE to trip bistables for failed channel within 6 hours of failure. • OPDT • OTDT • Low T-ave	**Tech Spec 3.3.1 and 3.3.2**
	SRO	Checks if failed channel has been identified	YES
	SRO	Call WCC SRO and have WR written, IAE to investigate and repair and evaluate T.S.	

Event 3: "A" S/G NR Level channel 1 fails **Low**

Time	Pos.	Expected Actions/ Behavior	Comments
	BOP	Refer to annunciator responses • A-1 • B-1	Annunciators on 1AD-4 Per annunciator response and AP/06 the operator will swap failed controller from normal to alternate
	RO	Places Feed Regulator to Manual Restores S/G level to program level	*Immediate Action*
	RO	Checks the following channel indicating the same: • Feed flow • Steam Flow • S/G Level	*Immediate Action*
	BOP	Announce Occurrence on page	
	BOP	Check Reactor Trip Breakers closed and > P-11	
	RO	Monitor S/G NR Level	If at any time S/G NR Level approaches 17% or 83%, then trip Reactor
	BOP	Check CM/CF feeding S/G	
	RO	S/G level stable or trending to program	
	BOP	Checks NC temperature with NC pumps on stable or trending to programmed temperature	
	RO	When the following are met then return affected S/G CF control to automatic 1. Selected control channels indicated correctly • Feed flow • Steam flow • S/G level 2. Affected S/G level restored to program level 3. Automatic control is desired	
	RO	Checks proper CF alignment	
	SRO	Contacts WCC to have WR written, have I&E investigate and repair failed channel and evaluate T.S. Exit procedure	**Failure will not be repaired**

Event 4: PR-42 fails **High**

	Pos.	Expected Actions/ Behavior	Comments
	CREW	Recognize symptoms of a Power Range Detector failure.	
	SRO	Enters AP-16 Case III	
	RO	Places Rods in "Manual"	*Immediate action*
	RO	Checks S/G's at programmed level	
	BOP	Announce occurrence on page	
	RO	Checks N-42 as only failed channel	
	RO	Position "PR to S/G Program Level Channel Defeat" switch to defeat inoperable channel.	
	RO	Reports power stable	
	BOP	Complete steps to take channel out of service and verifies proper lights - lit	
	RO	Ensure operable PR channel selected to record on NR45 chart recorder	
	RO	Adjusts control rods to maintain T-Ave = T-Ref	
	RO	When T-Ave = T-Ref to within + or - 1 deg-F, then return Rods to "Auto" if desired	
	SRO	Instruct IAE to fail associated B/S's for failed channel • OPDT • OTDT	
	BOP	When IAE trips B/S's, verifies proper status lights - lit	
	SRO	Call WCC to have WR written, have I&E investigate and repair and have T.S. evaluated	Instrument will not be repaired **T.S. 3.3.1.2 / 3.3.1.3 / 3.3.1.6 / 3.3.1.7 / 3.3.1.16.b / 3.3.1.16.c / 3.3.1.16.d**

Event 5: Pressurizer Level Master fails High.

	Pos.	Expected Actions/ Behavior	Comments
	CREW	Recognize charging flow increasing.	
	CREW	Determine from plant conditions (NC System temperature and pressure stable and PZR level going up) that there is an instrument failure.	
	SRO	Direct BOP to place 1NV-238 in manual and control charging flow.	
	SRO	Contact WCC to write WR, have I&E investigate and repair.	

Event 6: NC System Leak 50 gpm

Time	Pos.	Expected Actions/ Behavior	Comments
	CREW	Recognize symptoms of a system leak	
	SRO	Enters AP-10 Case 2	
	BOP	Check PZR Level stable or going up	
	BOP	• Maintain charging flow <175gpm • Ensure 1NV-238 opening • Open 1NV-214 maintain 6gpm seal flow • Reduce or isolate letdown • Start additional NV pump	
	CREW	Check PZR Level stable or increasing. If at any time PZR Level goes down return to step 1	
	BOP	Check PZR Pressure Stable or trending to 2235 psig	
	RO	Check Main Steam Lines intact	
	RO	Announce Occurrence on Page	
	CREW	Estimate leak rate	
	SRO	Refer to RP/0/A/5700/000	
	BOP	If at any time NC leakage exceeds T.S. place in service Outside Air Pressure Filter Train	
	SRO	Have another SRO evaluate if leakage exceeds SLC 16.9.7 condition C limits	
	BOP	If VCT level less than 16% swap NV pump suction to FWST	
	BOP	Check seal leakoff on NC pumps greater than 6 gpm	
	BOP	Check Thermal Barriers intact	
	SRO	Check if leak suspected on Letdown line near Demineralizers	
	SRO	Check leak on Letdown line	
	SRO	Check VCT intact	
	BOP	Check the following normal, PZR Safeties, PZR PORVs and PRT conditions	
	BOP	Check CLA levels normal	
	BOP	Check NCDT parameters normal	
	BOP	Check Containment floor and equipment sumps normal	
	SRO	Check leak location identified	

Time	Pos.	Expected Actions/ Behavior	Comments
	SRO	Contact Station Management to evaluate need to Shutdown	
	SRO	Check unit shutdown required	
	SRO	Shutdown per AP-4	
	SRO	Enter AP-4	
		Initiate a 2000 gpm leak by ejecting control rod M8	

Event 7 NC System leak 2000 gpm due to ejected rod

Time	Pos.	Expected Actions/ Behavior	Comments
	SRO	Go to E-0 and directs activities	
	SRO	Reviews Foldout page with crew	NCP trip criteria based on loss of subcooling
	RO	Report Reactor Trip: • rod bottom lights • reactor trip breakers open • I/R amps decreasing	*Immediate Action* Reactor will be tripped manually
	RO	Reports Turbine Generator tripped • TV's closed	*Immediate Action* Turbine will be tripped manually
	BOP	Reports ETA and ETB energized	*Immediate Action*
	RO	Reports SI status light - not LIT	*Immediate Action* S/I will be manually initiated
	BOP	Report LOCA sequencers (A & B) actuated	*Immediate Action*
	RO	Announce "Unit 1 Safety Injection" on page	
	BOP	Checks ESF Monitor Light Panel • Groups 1,2 and 5 DARK • Group 3 LIT • Checks OAC in service	
	BOP	Reports all Ss and St components in Group 4 LIT	
	RO	Reports that CA is running and at least 3 S/G's NR level > 17%	
	BOP	Reports KC pumps running	
	BOP	Reports RN pumps running	
	SRO	Directs Unit 2 Operator to throttle RN to minimum & start 2A RN pump	***EXAMINER CUE:*** • *2A RN pump is running*
	RO	Checks/reports all S/G pressures > 775 psig	
	BOP	Reports Containment pressure has not remained less than 3 psig	
	SRO	Record time of reactor trip	
	BOP	Reports Monitor Light Group 4, Row G, lit	
	BOP	Stop all NC pumps while maintaining seal injection	
	BOP	Secure RV pumps	
	BOP	Energize H2 Igniters	

Time	Pos.	Expected Actions/ Behavior	Comments
	SRO	Dispatch operator to secure all NF AHUs	
	BOP	Perform Encl. 2	
	BOP	Report NV Pump to Cold Leg Flow gauge - indicating flow - YES • checks NC pressure < 1600 psig • checks NI pumps indicating flow • checks NC pressure < 286 psig • checks ND pumps indicating flow	
	SRO	When available notifies OSM or other SRO to implement Generic Enclosure 21	**EXAMINER CUE:** **OSM will ensure Generic Enclosure 21 is implemented.**
	RO	• Checks CA flow > 450 gpm and takes control of CA to maintain no load levels • checks VI header pressure > 60 psig • Maintains N/R level between 32% and 50%	
	BOP	• If any NC pump ON, then check Tave stable or trending to 557 degrees • If all NC pumps off, then check NC T-colds stable or trending to 557 degrees.	If not stable and decreasing crew will go to Enclosure 3
	BOP	Reports Pzr PORV & Spray Valves closed	One PORV will be open but isolated
	BOP	Reports subcooling < 0 deg.	
	BOP	Reports all main steam lines INTACT	
	RO/ BOP	Report S/G tube rupture parameters indicate that S/G tubes intact	
	BOP	Checks if NC system is intact: • Containment EMFs – normal • Ice Condenser Lower Inlet Doors Open alarm – DARK • Containment pressure < 1 psig • Containment sump level normal	
	SRO	Implement F-0	
	CREW	Evaluate CSF trees	
	SRO	Enter FR-P.1	

Event 7 FR-P.1 Evaluation

Time	Pos.	Expected Actions/ Behavior	Comments
	BOP	*Reports NC pressure < 286 psig*	
	BOP	Reports ND pump flow is > 500 gpm	
	SRO	Return to procedure and step in effect and *enters FR-Z.1*	

Event 7 **FR-Z.1 Evaluation**

Time	Pos.	Expected Actions/ Behavior	Comments
	SRO	Determine a loss of emergency coolant recirc has not occurred and continue in procedure	
	Crew	Monitors foldout page	
	BOP	Ensure NC pumps and RV pumps are off.	
	SRO	Dispatches operator to close breakers for 1NI-173A and 1NI-178B	
	BOP	Reports containment pressure less than 15 psig	
	BOP	Reports both NS pumps on	
	SRO	Continues in FR-Z.1	
	SRO	Checks OAC in service	
	SRO	Checks the following light lit on group 4 • C-3 • C-6 • G-4 • G-5	
	SRO	Checks NS system in operation as follows • ECA 1.1 in effect - NO	Go to step 10.d
	BOP	Checks the following valves aligned • 1NS-18A - closed • 1NS-20A - open • 1NS-1B closed • 1NS-3B – open	
	BOP	Reports containment pressure greater than 3 psig Checks the following valves open • 1NS-32A and 1NS-29A • 1NS-12B and 1NS-15B • checks NS pumps on	
	BOP	Check phase "B" HVAC equipment per Encl.3	
	RO	Checks MSIVs and MSIV bypass valves closed	
	RO	Checks steam lines intact	
	SRO	Checks if any ND train is operating in the cold leg recirc mode – NO. When transfer to Cold Leg Recirc is complete perform step 14. Go to step 15	
	SRO	Ensures operator sent to stop NF AHUs Checks H2 analyzers in service NO. Send operators to put H2 Analyzers in service Go to step 16	
	SRO	Returns to procedure and step in effect. Goes to E-1	

Event 7 **E-1 Evaluation**

Time	Pos.	Expected Actions/ Behavior	Comments
	SRO	Enters E-1	
	SRO	Reviews fold out page with crew and reminds crew to monitor FWST level for 180 inches (Lo level)	**NOTE:** When FWST decreases to 180 inches, the crew should enter EP/ES-1.3 and manually swap to sump
	RO	Reports subcooling less than 0	
	RO	Reports main steam lines INTACT • All S/G pressures - STABLE OR GOING UP • All S/Gs - PRESSURIZED	
	RO	Checks S/G level > 32%. Resets CA Modulating Valves Reset switches and throttles CA flow as necessary to maintain 32-50%	
	RO	Checks secondary EMFs - NORMAL	
	BOP	Reports Pzr PORV Isol Valves open & energized and Pzr PORVs closed	
	SRO/ RO	Checks SI Termination Criteria NOT met Go to step 7f	
	BOP	Checks NS status: • NS pumps - ON • checks containment pressure < 2psig Go to step 9	
	SRO/ BOP	Checks ND pumps on and aligned to FWST Check NC pressure > 286 psig Go to step 11	
	SRO/ BOP	Reset SI and Load Sequencers and dispatch operator to locally stop D/Gs	
	SRO	Dispatch operators to locally stop NF AHUs and place H2 Analyzers in service	

Time	Pos.	Expected Actions/ Behavior	Comments
	BOP	Evaluate plant status: 1) Any ND pump available 2) Power available to 1ND-19A 1NI-185A 1ND-58A 1ND-4B 1NI-184B 1NI-136B 1NI-332A 1NI-333B 1NI-334B 1NI-147A 1NI-115B 1NI-144B 3) S Latch LIT for: 1NI-184B 1NI-185A 4) EMF-41 NORMAL 5) All area monitors NORMAL 6) Notify Chemistry to sample appropriately 7) Notify RP to sample Cont air 8) Consult Station Management on recovery	**Power will not be available to "A" train valves**
	BOP	Report NC pressure < 286 psig and ND flow to cold legs is > 500 gpm	
	SRO	Go to step 15 Checks transfer to cold leg recirc criteria • FWST level < 180 inches If not return to step 13	

Event 7 ES-1.3 Evaluation

Time	Pos.	Expected Actions/ Behavior	Comments
	SRO	Enters ES-1.3 on FWST low level	This procedure should be implemented without delay.
	SRO	Have STA monitor fold out page	
	SRO	This procedure should be implemented without delay.	
	BOP	Checks containment sump level >3 feet	
	BOP	Checks KC flow to ND heat exchangers > 5000 gpm	
	BOP	Resets SI and Load Sequencers	
	BOP	Checks NI-185A and 1A ND pump - ON	
	BOP	Checks NI-184B and 1B ND pump - ON	
	BOP	Closes 1FW-27A and checks ND pumps On	
	BOP	Aligns NV and NI systems • Check NC pressure < 1600 psig • Close 1NI-115B & 1NI-144B • Close 1NI-147A • Close 1ND-30A & 1ND-15B • Check open 1NI-334B • Open 1NI-332A & 1NI-333B • Open 1ND-58A & 1NI-136B • Close 1NI-100B • Close 1NV-221A &1NV-222B	
Terminate Scenario upon direction of Examiner			

Note to Examiner: Be sure SRO classifies event at end of scenario.

Classification of Event: Alert due to Greater than available makeup capacity as indicated by loss NCS subcooling.

SHIFT TURNOVER INFORMATION

UNIT 1 STATUS:

Power Level: 100% NCS [B] 13 ppm Pzr [B]: 13 ppm Xe: 2895pcm

Power History: At this power for 400 days Core Burnup: 440 EFPDs

CONTROLLING PROCEDURE: OP/1/A/6100/03 Controlling Procedure for Unit Operation

OTHER INFORMATION NEEDED TO ASSUME TO SHIFT:

"1A" Diesel Generator tagged for PM.
"1A" Motor Driven Auxiliary Feedwater Pump tagged for PM
Unit 2 is available for Auxiliary Steam
Reduce power per OP/1/A/6300/001 (Controlling Procedure for Unit Operation) Encl. 4.2 in preparation for Main Turbine Throttle Valve Movement Test.

Work Control SRO/Offsite Communicator **Thad**

Unit 2 SRO **Jim**

NLO's AVAILABLE

Unit 1	Unit 2
Aux Bldg. Eric	**Aux Bldg Bill**
Turb Bldg. Fred	**Turb/Service Bldg Buster**
Extra(s) Mark, Bruce	