

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

- Note:
1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
 2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
 3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.
 4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
 5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
 6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
 - 7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.
 8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
 9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

ES-401 BWR Examination Outline Form ES-401-1 Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO)									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	/ 2	(	K/A Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4						)	AA2.01 Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION :Power/flow map (CFR: 41.10 / 43.5 / 45.13)	3.5	1
295003 Partial or Complete Loss of AC / 6						)	2.1.14 Knowledge of system status criteria which require the notification of plant personnel. (CFR: 43.5 / 45.12)	2.5	2
295004 Partial or Total Loss of DC Pwr / 6						)	AA2.02 Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER :Extent of partial or complete loss of D.C. power (CFR: 41.10 / 43.5 / 45.13)	3.5	3
295005 Main Turbine Generator Trip / 3		X					AK2.02 Knowledge of the interrelationships between the MAIN TURBINE GENERATOR TRIP and the following: Feedwater temperature (CFR: 41.7 to 45.8)	2.9	4
295006 SCRAM / 1				X			AA1.06 Ability to operate and/or monitor the following as they apply to SCRAM : CRD hydraulic system. (CFR: 41.7 / 45.6)	3.5	5
295016 Control Room Abandonment / 7		X					AK2.01 Knowledge of the interrelations between CONTROL ROOM ABANDONMENT and the following: Remote shutdown panel: Plant-Specific (CFR: 41.7 / 45.8)	4.4	6
295018 Partial or Total Loss of CCW / 8	X						AK1.01 Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER : Effects on component/system operations. (CFR: 41.8 to 41.10)	3.5	7
295019 Partial or Total Loss of Inst. Air / 8			X				AK3.03 Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR : Service air isolations: Plant-Specific (CFR: 41.5 / 45.6)	3.2	8
295021 Loss of Shutdown Cooling / 4	X						AK1.02 Knowledge of the operational implications of the following concepts as they apply to LOSS OF SHUTDOWN COOLING : (CFR: 41.8 to 41.10) Thermal Stratification	3.6	9
295023 Refueling Acc / 8			X				AK3.02 Knowledge of the reasons for the following responses as they apply to REFUELING ACCIDENTS : Interlocks associated with fuel handling equipment.(CFR: 41.5 / 45.6)	3.4	10
295024 High Drywell Pressure / 5		X					EK2.18 Knowledge of the interrelations between HIGH DRYWELL PRESSURE and the following: Ventilation (CFR: 41.7 / 45.8)	3.3	11
295025 High Reactor Pressure / 3				X			EA1.05 Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE: RCIC: Plant-Specific (CFR: 41.7 /	3.7	12

						45.6)		
295026 Suppression Pool High Water Temp. / 5	X					EK1.01 Knowledge of the operational implications of the following concepts as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE : (CFR: 41.8 to 41.10) Pump NPSH	3.0	13
295027 High Containment Temperature / 5						Note 1		
295028 High Drywell Temperature / 5				X		EA1.04 Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE : Drywell pressure (CFR: 41.7 / 45.6)	3.9	14
295030 Low Suppression Pool Wtr Lvl / 5			X			EK3.06 Knowledge of the reasons for the following responses as they apply to LOW SUPPRESSION POOL WATER LEVEL: Reactor SCRAM (CFR: 41.5 / 45.6)	3.6	15
295030 Low Suppression Pool Wtr Lvl / 5						> G2.1.33 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. (CFR: 43.2 / 43.3 / 45.3)	3.4	16
295031 Reactor Low Water Level / 2						> G2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. (CFR: 41.10 / 43.2 / 45.6)	4.0	17
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1						> EA2.07 Ability to determine and/or interpret the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN : Containment conditions/isolations (CFR: 41.10 / 43.5 / 45.13)	4.0	18
295038 High Off-site Release Rate / 9						> EA2.03 Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE : Radiation levels (CFR: 41.10 / 43.5 / 45.13)	3.5	19
600000 Plant Fire On Site / 8		X				AK2.01 Knowledge of the interrelations between PLANT FIRE ON SITE and the following: AK2.01 Sensors / detectors and valves	2.6	20
K/A Category Totals:	3	4	3	3	<	>	Group Point Total:	20

ES-401 BWR Examination Outline Form ES-401-1 Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	/ 2	(	K/A Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4						)	AA2.03 Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : Actual core flow (CFR: 41.10 / 43.5 / 45.13)	3.3	S76
295003 Partial or Complete Loss of AC / 6						)	G2.1.33 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. (CFR: 43.2 / 43.3 / 45.3)	4.0	S77
295004 Partial or Total Loss of DC Pwr / 6									
295005 Main Turbine Generator Trip / 3									
295006 SCRAM / 1						)	2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies. (CFR: 43.5 / 45.11)	3.6	S79
295016 Control Room Abandonment / 7									
295018 Partial or Total Loss of CCW / 8						)	AA2.01 Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER : Component temperatures (CFR: 41.10 / 43.5 / 45.13)	3.4	S78
295019 Partial or Total Loss of Inst. Air / 8									
295021 Loss of Shutdown Cooling / 4									
295023 Refueling Acc / 8									
295024 High Drywell Pressure / 5									
295025 High Reactor Pressure / 3									
295026 Suppression Pool High Water Temp. / 5						)	EA2.01 Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Suppression pool water temperature (CFR: 41.10 / 43.5 / 45.13)	4.2	S80
295027 High Containment Temperature / 5							Note 1		
295028 High Drywell Temperature / 5									
295030 Low Suppression Pool Wtr Lvl / 5									
295031 Reactor Low Water Level / 2									
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1						)	G2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. (CFR: 41.10 / 43.2 / 45.6)	4.3	S81
295038 High Off-site Release Rate / 9						)	EA2.03 Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE : †Radiation levels (CFR: 41.10 / 43.5 / 45.13)	4.3	S82
600000 Plant Fire On Site / 8									
K/A Category Totals:						4	Group Point Total:		7



ES-401 BWR Examination Outline Form ES-401-1 Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO)									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	/ 2	(	K/A Topic(s)	IR	#
295002 Loss of Main Condenser Vac / 3									
295007 High Reactor Pressure / 3									
295008 High Reactor Water Level / 2									
295009 Low Reactor Water Level / 2	X						AK1.02 Knowledge of the operational implications of the following concepts as they apply to LOW REACTOR WATER LEVEL : Recirculation pump net positive suction head: Plant-Specific (CFR: 41.8 to 41.10)	3.0	21
295010 High Drywell Pressure / 5									
295011 High Containment Temp / 5							Note 1		
295012 High Drywell Temperature / 5						)	AA2.02 Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE : Drywell pressure (CFR: 41.10 / 43.5 / 45.13)	3.9	22
295013 High Suppression Pool Temp. / 5									
295014 Inadvertent Reactivity Addition / 1			X				AK3.01 Knowledge of the reasons for the following responses as they apply to INADVERTENT REACTIVITY ADDITION: Reactor SCRAM (CFR: 41.5 / 45.6)	4.1	23
295015 Incomplete SCRAM / 1									
295017 High Off-site Release Rate / 9									
295020 Inadvertent Cont. Isolation / 5 & 7									
295022 Loss of CRD Pumps / 1						)	G2.1.30 Ability to locate and operate components / including local controls. (CFR: 41.7 / 45.7)	3.9	24
295029 High Suppression Pool Wtr Lvl / 5									
295032 High Secondary Containment Area Temperature / 5		X					EK2.06 Knowledge of the interrelations between HIGH SECONDARY CONTAINMENT AREA TEMPERATURE and the following: Area temperature monitoring system (CFR: 41.7 / 45.8)	3.3	25
295033 High Secondary Containment Area Radiation Levels / 9									
295034 Secondary Containment Ventilation High Radiation / 9									
295035 Secondary Containment High Differential Pressure / 5				X			EA1.02 Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: SBTG/FRVS (CFR: 41.7 / 45.6)	3.8	26
295036 Secondary Containment High Sump/Area Water Level / 5						)	EA2.03 Ability to determine and/or interpret the following as they apply to Secondary Containment High Sump/Area Water Level. Cause of the high water level. ((CFR: 41.10/43.5/45.13)	3.4	27
500000 High CTMT Hydrogen Conc. / 5									
K/A Category Point Totals:	1	1	1	1	2	1	Group Point Total:		7

ES-401 BWR Examination Outline Form ES-401-1 Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (SRO)									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	/ 2	(	K/A Topic(s)	IR	#
295002 Loss of Main Condenser Vac / 3									
295007 High Reactor Pressure / 3									
295008 High Reactor Water Level / 2									
295009 Low Reactor Water Level / 2									
295010 High Drywell Pressure / 5									
295011 High Containment Temp / 5							Note 1		
295012 High Drywell Temperature / 5									
295013 High Suppression Pool Temp. / 5									
295014 Inadvertent Reactivity Addition / 1						)	AA2.03 Ability to determine and/or interpret the following as they apply to INADVERTENT REACTIVITY ADDITION : Cause of reactivity addition (CFR: 41.10 / 43.5 / 45.13)	4. 3	S83
295015 Incomplete SCRAM / 1									
295017 High Off-site Release Rate / 9									
295020 Inadvertent Cont. Isolation / 5 & 7									
295022 Loss of CRD Pumps / 1									
295029 High Suppression Pool Wtr Lvl / 5									
295032 High Secondary Containment Area Temperature / 5									
295033 High Secondary Containment Area Radiation Levels / 9									
295034 Secondary Containment Ventilation High Radiation / 9						)	295034.G2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. (CFR: 43.2)	3. 7	S84
295035 Secondary Containment High Differential Pressure / 5						)	295035.G2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4. 3	S85
295036 Secondary Containment High Sump/Area Water Level / 5									
500000 High CTMT Hydrogen Conc. / 5									
K/A Category Point Totals:						)	Group Point Total:		3

ES-401BWR Examination Outline													Form ES-401-1	
Plant Systems - Tier 2/Group 1 (RO)														
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	/	A 3	A 4	(	K/A Topic(s)	IR	#
203000 RHR/LPCI: Injection Mode						X						K6.04 Knowledge of the effect that a loss or malfunction of the following will have on the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) : Keep Fill System(CFR: 41.7 / 45.7)	3.3	28
205000 Shutdown Cooling						X						K6.04 Knowledge of the effect that a loss or malfunction of the following will have on the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) : Reactor Water Level (CFR: 41.7 / 45.7)	3.6	29
206000 HPCI											)	G2.2.22 Knowledge of limiting conditions for operations and safety limits. (CFR: 43.2 / 45.2)	3.4	30
207000 Isolation (Emergency) Condenser												Note 2		
209001 LPCS											)	A2.02 Ability to (a) predict the impacts of the following on the LOW PRESSURE CORE SPRAY SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Valve closures (CFR: 41.5 / 45.6)	3.2	31
209002 HPCS												Note 3		
211000 SLC									X			A3.06 Ability to monitor automatic operations of the STANDBY LIQUID CONTROL SYSTEM including: RWCU: Plant-Specific (CFR: 41.7 / 45.7)	4.0	32
211000 SLC		X										K2.01 Knowledge of electrical power supplies to the following: SBLC pumps (CFR: 41.7)	2.9	33
212000 RPS					X							K5.02 Knowledge of the operational implications of the following concepts as they apply to REACTOR PROTECTION SYSTEM : Specific logic arrangements (CFR: 41.5 / 45.3)	3.3	34
215003 IRM										X		A4.04 Ability to manually operate and/or monitor in the control room: IRM back panel switches, meters, and indicating lights (CFR: 41.7 / 45.5 to 45.8)	3.7	35
215004 Source Range Monitor	X											K1.06 Knowledge of the physical connections and/or cause effect relationships between SOURCE RANGE MONITOR (SRM) SYSTEM and the following: Reactor vessel (CFR: 41.2 to 41.9 / 45.7 to 45.8)	2.8	36
215005 APRM / LPRM							X					A1.03 Ability to predict and/or monitor changes in parameters associated with operating the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM controls including: Control rod block status (CFR: 41.5 / 45.5)	3.6	37

															control: Plant-Specific (CFR: 41.7)		
264000 EDGs			X												K3.01 Knowledge of the effect that a loss or malfunction of the EMERGENCY GENERATORS (DIESEL/JET) will have on following: Emergency core cooling systems CFR: 41.7 / 45.4)	4.2	51
300000 Instrument Air													X		A4.01 Ability to manually operate and / or monitor in the control room: Pressure gauges (CFR: 41.7 / 45.5 to 45.8)	2.6	52
400000 Component Cooling Water															A2.02 Ability to (a) predict the impacts of the following on the CCWS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: High/low surge tank level (CFR: 41.5 / 45.6)	2.8	53
K/A Category Point Totals:	3	2	2	2	2	3	2	2	2	3	2	3	2		Group Point Total:		26

ES-401BWR Examination Outline													Form ES-401-1	
Plant Systems - Tier 2/Group 1 (SRO)														
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	/ 2	A 3	A 4	(	K/A Topic(s)	IR	#
203000 RHR/LPCI: Injection Mode														
205000 Shutdown Cooling											)	G2.2.22 Knowledge of limiting conditions for operations and safety limits. (CFR: 43.2 / 45.2)	4.1	S86
206000 HPCI														
207000 Isolation (Emergency) Condenser												Note 2		
209001 LPCS														
209002 HPCS												Note 3		
211000 SLC											)	A2.05 Ability to (a) predict the impacts of the following on the STANDBY LIQUID CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of SBLC tank heaters (CFR: 41.5 / 45.6)	3.4	S87
212000 RPS											)	G2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. (CFR: 43.2)	2.9	S88
215003 IRM														
215004 Source Range Monitor											)	A2.03 Ability to (a) predict the impacts of the following on the SOURCE RANGE MONITOR (SRM) SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Stuck detector (CFR: 41.5 / 45.6)	3.3	S89
215005 APRM / LPRM														
217000 RCIC														
218000 ADS														
223002 PCIS/Nuclear Steam Supply Shutoff														
239002 SRVs														
259002 Reactor Water Level Control														
261000 SGTS														
262001 AC Electrical Distribution											)	262001.A2.10 Ability to (a) predict the impacts of the following on the A.C. ELECTRICAL DISTRIBUTION ; and (b) based on those predictions, use procedures to correct,	3.4	S90

Facility:		Date of Exam:				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.32	Ability to explain and apply system limits and precautions. (CFR: 41.10 / 43.2 / 45.12)	3.4	66		
	2.1.30	Ability to locate and operate components / including local controls. (CFR: 41.7 / 45.7)	3.9	67		
	2.1.16	Ability to operate plant phone / paging system / and two-way radio. (CFR: 41.10 / 45.12)	2.9	68		
	2.1.34	Ability to maintain primary and secondary plant chemistry within allowable limits. (CFR: 41.10 / 43.5 / 45.12)			2.9	S94
	Subtotal			3		1
2. Equipment Control	2.2.13	Knowledge of tagging and clearance procedures. (CFR: 41.10 / 45.13)	3.6	69		
	2.2.1	2.2.1 Ability to perform pre-startup procedures for the facility / including operating those controls associated with plant equipment that could affect reactivity. (CFR: 45.1)	3.7	70		
	2.2.18	Knowledge of the process for managing maintenance activities during shutdown operations. (CFR: 43.5 / 45.13)			3.6	S95
	2.2.32	Knowledge of the effects of alterations on core configuration. (CFR: 43.6)			3.3	S96
	Subtotal			2		2
3. Radiation Control	2.3.11	Ability to control radiation releases. (CFR: 45.9 / 45.10)	2.7	71		
	2.3.4	Knowledge of radiation exposure limits and contamination control / including permissible levels in excess of those authorized. (CFR: 43.4 / 45.10)	2.5	72		
	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements. (CFR: 41.12 / 43.4. 45.9 / 45.10)			3.0	S97
	2.3.3	Knowledge of SRO responsibilities for auxiliary systems that are outside the control room (e.g. / waste disposal and handling systems). (CFR: 43.4 / 45.10)			2.9	S98
	Subtotal			2		2
4. Emergency Procedures / Plan	2.4.39	Knowledge of the RO's responsibilities in emergency plan implementation. (CFR: 45.11)	3.3	73		
	2.4.34	Knowledge of RO tasks performed outside the main control room during emergency operations including system geography and system implications. (CFR: 43.5 / 45.13)	3.8	74		
	2.4.48	Ability to interpret control room indications to verify the status and operation of system / and understand how operator actions and directives affect plant and system conditions. (CFR: 43.5 / 45.12)	3.5	75		
	2.4.11	Knowledge of abnormal condition procedures. (CFR: 41.10 / 43.5 / 45.13)			3.6	S99
	2.4.3	Ability to identify post-accident instrumentation. (CFR: 41.6 / 45.4)			3.8	S100
	Subtotal			3		2

Tier 3 Point Total		10		7
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Note 1: Cooper Nuclear Station does not have a Mark III containment.

Note 2: Cooper Nuclear Station does not have an isolation condenser.

Note 3: Cooper Nuclear Station does not have a High Pressure Core Spray System (HPCS).

Note 4: Cooper Nuclear Station has abandoned the Rod Sequence Control System (RSCS).

Note 5: Cooper Nuclear Station does not have a Rod Control and Information System (RCIS).

Note 6: Cooper Nuclear Station does not have an automated MSIV leakage control system.

Facility: <u>Cooper Nuclear Station</u>		Date of Examination: <u>10-02-06</u>
Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: <u>1</u>
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, N	Perform Jet Pump Operability Surveillance SKL034-20-XX
Conduct of Operations	R, N	Reactor Recirc Pump Startup. Procedure 2.2.68.1 Attachment 1
Equipment Control	R, N	Surveillance Testing – Review 6.HPCI.201 HPCI Valve Operability Test (IST) (SKL034-50-49)
Radiation Control	R, N	Determine ALARA requirements for two workers.
Emergency Plan	N/A	N/A
<p>NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.</p>		
<p>* Type Codes & Criteria:</p> <p>(C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1; randomly selected)</p>		

Facility: <u>Cooper Nuclear Station</u>	Date of Examination: <u>10/02/2006</u>	
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	Operating Test No.: <u>1</u>	
Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. Manually Start SLC Injection per 2.2.74	A,E,P,S	1
b. Manually Start up the RCIC System (SKL034-20-21) NRC Developing	A,E,S	2
c. Perform ADS Manual Valve Actuation Surveillance (SKL034-20-77)	A,D,M,S	3
d. Perform the Latching and rolling of the Main Turbine per 2.2.77	A,N,S	4
e. Startup Suppression Pool Cooling Mode Of RHR NRC Developing	A,N,S	5
f. Transfer 4160 VAC Bus 1G From DG2 To 4160 VAC Bus 1B	D,S	6
g. Perform the Panel 9-5 section of 6-RWM-301 NRC Developing	L,N,S	7
h. Perform the Control Room Operator Actions for a fire per 5.4FIRE	E,N,S	8
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. 5.3ALT-STRATEGY -SENSITIVE INFORMATION	D,E,R	4
j. Startup RPS Motor Generator Set	N,C	7
k. Manually Vent the Scram Air Header, per 5.8.3 NRC Developing	E,N,R	1
@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.		
* Type Codes	Criteria for	RO / SRO-I / SRO-U
(A)lternate path		4-6 / 4-6 / 2-3
(C)ontrol room		
(D)irect from bank		≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant		≥ 1 / ≥ 1 / ≥ 1
(L)ow-Power / Shutdown		≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)		≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams		≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA		≥ 1 / ≥ 1 / ≥ 1
(S)imulator		

Facility: <u>Cooper Nuclear Station</u>		Date of Examination: <u>10-02-06</u>
Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/>		Operating Test Number: <u>1</u>
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R,N	Mode change requirements reviewed. Procedure 2.1.1
Conduct of Operations	R,N	Review Reactor Recirc Idle Loop Startup.
Equipment Control	R,D	Develop, Verify & Implement Tagouts (2) SKL034-50-XX
Radiation Control	R,D	Determine the Rad Exposure during Emergency
Emergency Plan	S,D	EAL Tabletop
<p>NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.</p>		
<p>* Type Codes & Criteria:</p> <p>(C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1; randomly selected)</p>		

Facility: <u>Cooper Nuclear Station</u>	Date of Examination: <u>10/02/2006</u>	
Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>	Operating Test No.: <u>1</u>	
Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. Manually Start SLC Injection per 2.2.74	A,E,P,S	1
b. N/A		
c. N/A		
d. Perform the Latching and rolling of the Main Turbine per 2.2.77	A,N,S	4
e. N/A		
f. N/A		
g. Perform the Panel 9-5 section of 6-RWM-301	L,N,S	7
h. N/A		
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. N/A		
j. Startup RPS Motor Generator Set	N,C	7
k. Manually Vent the Scram Air Header, per 5.8.3	E,N,R	1
@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.		
* Type Codes	Criteria for	RO / SRO-I / SRO-U
(A)lternate path		4-6 / 4-6 / 2-3
(C)ontrol room		
(D)irect from bank		≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant		≥ 1 / ≥ 1 / ≥ 1
(L)ow-Power / Shutdown		≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)		≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams		≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA		≥ 1 / ≥ 1 / ≥ 1
(S)imulator		

Facility: <u>Cooper Nuclear Station</u>	Date of Examination: <u>10/02/2006</u>	
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	Operating Test No.: <u>1</u>	
Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. Manually Start SLC Injection per 2.2.74	A,E,P,S	1
b. Manually Start up the RCIC System (SKL034-20-21)	A,M,E,S	2
c. Perform ADS Manual Valve Actuation Surveillance (SKL034-20-77)	A,D,M,S	3
d. Perform the Latching and rolling of the Main Turbine per 2.2.77	A,N,S	4
e. Startup Suppression Pool Cooling Mode Of RHR	A,N,S	5
f. Transfer 4160 VAC Bus 1G From DG2 To 4160 VAC Bus 1B	D,S	6
g. Perform the Panel 9-5 section of 6-RWM-301	L,N,S	7
h. N/A		
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. 5.3ALT-STRATEGY -SENSITIVE INFORMATION	D,E,R	4
j. Startup RPS Motor Generator Set	N,C	7
k. Manually Vent the Scram Air Header, per 5.8.3	E,N,R	1
@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.		
* Type Codes	Criteria for	RO / SRO-I / SRO-U
(A)lternate path		4-6 / 4-6 / 2-3
(C)ontrol room		
(D)irect from bank		≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant		≥ 1 / ≥ 1 / ≥ 1
(L)ow-Power / Shutdown		≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)		≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams		≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA		≥ 1 / ≥ 1 / ≥ 1
(S)imulator		

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

Examiners: _____ Operators: _____

Initial Conditions: The plant is operating at 100% power near the end of the current fuel cycle when the crew takes the shift. The plant is in a normal configuration with the B REC Heat Exchanger in Standby, and the A REC Heat Exchanger in service.

Turnover: The plant is operating at 100% power near the end of the current fuel cycle. The plant is in a normal configuration with the B REC Heat Exchanger in Standby, and the A REC Heat Exchanger in service. Procedure 2.2.65.1 is to be used to swap heat exchangers. REC HX B is in Standby in accordance with Section 19, and an Operator is standing by in R-931-REC HX area. River temperature is 65. REC temperature will be locally controlled after the HX swap.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N	Swap REC Heat Exchangers.
2	1	I	LPRM fails downscale.
3	N/A	C	Condensate Booster Pump failure. Rapidly decrease Reactor power using Recirculation
4	2	C	HPCI inadvertently starts. (Damaged so that it will not start if needed.)
5	3	M	All Bypass Valves open. Reactor reaches level 8. Bypass valves close. Reactor does not scram (ATWS).
6	N/A	C	HPCI fails to start. Feedwater pumps fail to restart.
7	N/A	N	Emergency Depressurization

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

SCENARIO SUMMARY

The crew is instructed to swap the in service heat exchanger. After the evolution is complete, a single LPRM fails downscale. The operators must bypass the LPRM in the APRM channel, but the APRM remains operable. The operators receive a fire alarm, and a call that the B Condensate Booster Pump is smoking. The operators commence a rapid power reduction and remove the pump from service. The power reduction is with Recirc only, and no rods will need to be moved immediately. There is no fire, and the pump stops smoking after it is de-energized. After the plant has stabilized, and the fire is not a threat, HPCI inadvertently starts. The operators respond by securing the system. However, one of the critical breakers is damaged so that the system will not restart. The bypass valves go full open, causing Reactor level to reach 8. Most of the control rods do not scram due to channel bowing. HPCI and the A Feedwater Pump will not start, but RCIC starts and injects. However, the Reactor is at approximately 25% power, so the crew is forced to Emergency Depressurize. When the crew Emergency Depressurizes, The Scenario ends with RCIC controlling level, boric acid injected, and rods driven in.

CRITICAL TASK

1. Insert Control Rods by RMCS or by Scram
2. Emergency Depressurize to allow low pressure systems to recover level.

Facility: Cooper Nuclear Station Scenario No.: 2 No.: _____

Examiners: _____ Operators: _____

Initial Conditions: The plant is operating at 100% power at the End of Cycle. The plant is in a 7 day LCO due to 1A SLC pump being out of service to replace the discharge relief valve that has failed open.

Turnover: Today is not a red light day. Start SW Pump B and secure D SW Pump.

Event No.	Malf. No.	Event Type*	Event Description
1.	N/A	N	Swap Service Water Pumps
2.	1	C	Service Water Pump D trip and LCO
3.	2	C,R	Feedwater Heater 5A Tube Failure 2.4Ex-Stm; Reduce power to exit the Loss of Feedwater Heating Region.
4.	3	I	NBI-LIS-101B failure that causes a ½ scram.
5.	4	C,R	Hydrogen leak entry into 2.4GEN-H2; Reduce power to allow repair of H2 Regulator.
6.	5	C	CRD Pump B Trip
7.	6	M	RR Pump vibration and eventual LOCA and Scram.
8.	6	C	Loss of the Startup Transformer and Lockout of 4160 1G,
9.	7	C	Failure of CS injection valve to auto open. Use of RHR and CS to restore reactor water level; Control Restore Reactor water level/Cool Containment

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

SCENARIO SUMMARY

The plant is operating at 100% power with "A" SLC pump tagged out when the crew assumes the shift.

The crew performs a swap of the operating Service Water Pumps. When the B SW Pump is started the D SW Pump trips requiring entry into LCO 3.7.2. After the SW pumps are swapped and Tech Specs are addressed, the 5A Feedwater Heater develops a tube leak and causes a lowering feedwater temperature.

After power is lowered, the NBI-LIS-101 B fails low due to a partially open equalizing valve, resulting a ½ scram that can be fixed and the ½ scram reset. Once the ½ scram is reset, a hydrogen leak develops and lowers pressure to approximately 40 psig. Power will be reduced to approximately 85% to allow repairs. When the repairs are in progress, the B CRD Pump trips requiring the RO to startup the standby pump.

The major event starts as a vibration of the A Reactor Recirc Pump requiring the eventual tripping of the pump and entry into 2.4RR. The vibrations will cause a preexisting flaw in the RR pipe to fail resulting in a large RR pump discharge line break that is not isolable. When the turbine is tripped the Startup Transformer locks out and the emergency transformer picks up only 4160 1F. The CS and RHR pumps powered from 4160 1F automatically start but the CS injection fails to automatically open and must be manually opened. The leak is large enough so that RHR alone has insufficient capacity to refill the RPV and the CS valve must be opened to restore level.

The scenario ends when RPV level is being maintained 3" to 54".

CRITICAL TASKS

1. The crew shall restore 41601F to service to provide containment and core cooling.
2. The crew shall align CS injection valve to restore and maintain reactor water level greater than TAF.

Facility: CNS Scenario No.: 3 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: The plant is operating at 32% power at the end of the fuel cycle with a normal reactor startup in progress. Containment Inerting is in progress. DPIC-835B, Reactor Building differential pressure controller is out of service due to an unknown failure.

Turnover: The plant is operating at 32% power at the end of the fuel cycle with a normal reactor startup in progress. The rod sequence is at RWM group 10/1, Step 5. A power ascension to 40% has been directed, at which point, a MSIV closure surveillance will be performed. Containment Inerting is in progress

Event No.	Malf. No.	Event Type *	Event Description
1	N/A	R	Raise power to 40% using Control rods and Reactor Recirc.
2	1	I	RWM Failure halts the power ascension
3	2	C	During MSIV Surveillance the 86D MSIV Fails As-Is in mid position.
4	3	I	Reactor Building ventilation failure due to the in service controller failing in Auto, causing building ΔP to rise and go positive.
5	4	C	Earthquake – Loss of off-site power requiring manual alignment
6	5	M	LOCA – Medium Break, requiring use of low pressure systems to recover level.
* (N)ormal (R)eactivity (I)nstrument (C)omponent (M)ajor			

SCENARIO SUMMARY

The crew raises power by pulling rods and raising Recirc flow. While they are pulling rods, the RWM fails "INOP". The RWM must bypass or wait for repairs to finish pulling rods. The rod sequence is at RWM group 10/1, Step 5. A power ascension to 40% has been directed, at which point, the BOP operator will complete MSIV IST testing Section 5 for valve 86D only.

Once reactor power is approximately 40% the MSIV surveillance is commenced. The outboard 86D MSIV will fail mid-position and will not reopen. The CRS will order close the inboard MSIV in order to satisfy the TS. After the plant has stabilized, a malfunction of differential pressure controller DPIC-835A on the Reactor Building HVAC system results in high reactor building pressure and entry into EOP 5A Secondary Containment Control.

An earthquake results in a total loss of offsite power and a Medium Break LOCA simultaneously. Emergency Bus 1F locks out and the Diesel Generator Output Breaker 1GS does not automatically close. This forces the operator to manually close the breaker to make all of the equipment on the bus available.

CRITICAL TASK

1. Recovers Reactor Building Ventilation to restore it to a negative.
2. Realigns Electrical Power to supply Critical Busses
3. Restores Reactor level above TAF.