ES-301 **Administrative Topics Outline** **Form ES-301-1**

Facility: Cooper Nuclear Station Date of Examination: 9/21/2009

Examination Level: RO X SRO ☐ Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	S, D, P	Obtain and Interpret a GARDEL Periodic Case
Conduct of Operations		NOT TESTED
Equipment Control	S, D	Determine isolation boundaries for REC pump wearing ring replacement.
Radiation Control	R,D	Radiation Protection Table top scenario
Emergency Procedures/Plan	R, N	Determine RPV water level instrumentation availability during LOCA conditions

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.

* Type Codes & Criteria:
(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)

Facility: Cooper Nuclear Station Date of Examination: 9/21/2009

Examination Level: RO ☐ SRO X Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	S, M	Security Emergency
Conduct of Operations	R, D	Determine if Shift Staffing requirements are adequate for mode change
Equipment Control	S, D	Review Jet Pump Operability Test
Radiation Control	R, D	Review and Approve a Liquid Radioactive Waste Discharge Permit
Emergency Procedures/Plan	D, R, P	EAL Table Top

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.

* Type Codes & Criteria:
(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)

ES-301 **Control Room/In-Plant Systems Outline** **Form ES-301-2**

Facility: ___Cooper Nuclear Station_____ Date of Examination: _9/21/2009____

Exam Level: RO X SRO-I ☐ SRO-U ☐ Operating Test No.: _____

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. Respond to a Trip of a Reactor Recirc Pump (Alternate Path)	A,D,S	1
b. Perform quick Restart of RFPT B (Hard Card) (Alternate Path)	A,M,P,S	2
c. Transfer Governor Valve Control from Manual to Auto with DEH in Mode IV	D,S	3
d. High Pressure Coolant Injection / Manually Initiate	EN,M,S, L	4
e. Align REC for Drywell Cooling after REC isolation on Low Pressure	D, S	8
f. Transfer of 4160V Bus 1G from DG2 to Emergency Transformer	D,L,P,S	6
g. Install EOP PTMs 57, 58, 59, 60	D, S	7
h. SGT System Support for HPCI operations (Alternate Path)	A,EN,M,S,L	9

In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i. Manually Vent the Scram Air Header	E,D,P,R	1
j. Respond to No Break Power Panel Failure (Alternate Path)	A,D	6
k. Inject Fire Water into RHR (Level control)	D,E	2

@ 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
(EN)gineered safety feature	- / - / ≥1 (control room system)
(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: ___Cooper Nuclear Station_____ Date of Examination: _9/21/2009____
Exam Level: RO ☐ SRO-I ☐ SRO-U X Operating Test No.: _____

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.		
b. High Pressure Coolant Injection / Manually Initiate	EN,M,S,L	4
c.		
d. Perform quick Restart of RFPT B (Hard Card) (Alternate Path)	A,M,P,S	2
e.		
f.		
g.		
h. SGT System Support for HPCI operations (Alternate Path)	A,EN,M,S,L	9

In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i. Manually Vent the Scram Air Header, per 5.8.3	E,D,P,R	1
j. Respond to No Break Power Panel Failure (Alternate Path)	A,D	6
k.		

@ 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
(EN)gineered safety feature	- / - / ≥1 (control room system)
(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: ___Cooper Nuclear Station_____ Date of Examination: _9/21/2009____

Exam Level: RO ☐ SRO-I X SRO-U ☐ Operating Test No.: _____

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. Respond to a Trip of a Reactor Recirc Pump (Alternate Path)	A,D,S	1
b. Perform quick Restart of RFPT B (Hard Card) (Alternate Path)	A,M,P,S	2
c. Transfer Governor Valve Control from Manual to Auto with DEH in Mode IV	D,S	3
d. High Pressure Coolant Injection / Manually Initiate	EN,M,S, L	4
e. Align REC for Drywell Cooling after REC isolation on Low Pressure	D, S	8
f. Transfer of 4160V Bus 1G from DG2 to Emergency Transformer	D,L,P,S	6
g.		
h. SGT System Support for HPCI operations (Alternate Path)	A,EN,M,S,L	9
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Manually Vent the Scram Air Header	E,D,P,R	1
j. Respond to No Break Power Panel Failure (Alternate Path)	A,D	6
k. Inject Fire Water into RHR (Level control)	D,E	2

@ 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
(EN)gineered safety feature	- / - / ≥1 (control room system)
(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:		Date of Exam:																
APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO **X** SRO-I ☐ SRO-U ☐	RX					1									1	1	0
	NOR			1											1	1	1
	I/C			3		3									4	4	2
	MAJ			1		2									2	2	1
	TS														0	2	2
RO ☐ SRO-I **X** SRO-U ☐	RX		1												1	1	0
	NOR				1										1	1	1
	I/C		3		4										4	4	2
	MAJ		1		2										2	2	1
	TS				2										0	2	2
RO ☐ SRO-I ☐ SRO-U **X**	RX														1	1	0
	NOR	2													1	1	1
	I/C	5													4	4	2
	MAJ	1													2	2	1
	TS	2													0	2	2
RO **X** SRO-I ☐ SRO-U ☐	RX		1												1	1	0
	NOR						1								1	1	1
	I/C		3				4								4	4	2
	MAJ		1				2								2	2	1
	TS														0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.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 1-for-1 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 requirements specified for the applicant's license level in the right-hand columns.

Facility:		Date of Exam:														Operating Test No.:		
APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ☐ SRO-I **X** SRO-U ☐	RX					1									1	1	0
	NOR	1													1	1	1
	I/C	5				3									4	4	2
	MAJ	1				2									2	2	1
	TS	2													0	2	2
RO ☐ SRO-I ☐ SRO-U **X**	RX														1	1	0
	NOR				1										1	1	1
	I/C				4										4	4	2
	MAJ				2										2	2	1
	TS				2										0	2	2
RO **X** SRO-I ☐ SRO-U ☐	RX								2						1	1	0
	NOR						1								1	1	1
	I/C						4		3						4	4	2
	MAJ						2		2						2	2	1
	TS														0	2	2
RO **X** SRO-I ☐ SRO-U ☐	RX					1									1	1	0
	NOR			1						1					1	1	1
	I/C			3		3				2					4	4	2
	MAJ			1		2				2					2	2	1
	TS														0	2	2

Instructions:

3. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

4. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.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 1-for-1 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 requirements specified for the applicant's license level in the right-hand columns.

Facility:		Date of Exam:		Operating Test No.:

APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ☐ SRO-I ☐ SRO-U **X**	RX														1	1	0
	NOR							1							1	1	1
	I/C							5							4	4	2
	MAJ							1							2	2	1
	TS							2							0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

Instructions:

5. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the “at-the-controls (ATC)” and “balance-of-plant (BOP)” positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

6. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.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 1-for-1 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 requirements specified for the applicant’s license level in the right-hand columns.

Transient and Event Checklist

Facility: Date of Exam: Operating Test No.:

APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

Instructions:

7. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

8. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.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 1-for-1 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 requirements specified for the applicant's license level in the right-hand columns.

Facility: Cooper Nuclear Station Scenario No.: NRC 1 Op-Test No.: _____

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: The plant is operating at 8% power with a startup in progress.

Turnover: Raise power and put the main turbine on line. Rod 22-27 has been inserted from 48 to 46 to return temperatures back into the normal band.

Event No.	Malf. No.	Event Type*	Event Description
1		R	Raise power to get 50% bypass valve position
2	1	I	Torus Level Instrument Fails Upscale
3	2	C	Difficult to move Control Rod
4	3	N	Role the Turbine
5	4	C	TEC Pump Trip
6	5	C	Single MSIV Inadvertent Closure
7	6	C	Rod Drop Accident
8	7	M	Fuel Failure/Scram/Failure of Scram discharge volume drain valve to close.
9	8	C	Group 6 isolation failure

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

Appendix D **Scenario Outline** **Form ES-D-1**

Facility: Cooper Nuclear Station Scenario No.: NRC 2 Op-Test No.: 2009 NRC

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: Near End of Operating Cycle 95% power and raising power to 100%. EDG 1 running unloaded for break-in run after maintenance that replaced 1 piston.

Turnover: Continue EDG 1 synch and load per procedure. Continue raising power to rated power. EDG 1 LCO due to maintenance.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Synchronize and Load EDG 1 per procedure.
2		R	Raise Power with RR to rated power
3	1	C	HPCI inadvertent Initiation
4	2	C	Condensate Pump A Trip, A RR Pump Fails to run back
5	3	I	APRM B fails at 100%
6	4	M	Main turbine vibration increase resulting in Turbine Trip Required, Reactor Manual Scram (ATWS no rods move)
7	5	M	Non Critical Busses fail to fast transfer on Turbine Trip
8	6	C	SLC Pump A starts then trips immediately
9	7	I	RCIC Flow Controller Fails Low must be taken to manual
10	8	C	RCIC Turbine Trip

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

Appendix D **Scenario Outline** **Form ES-D-1**

Facility: Cooper Nuclear Station Scenario No.: _NRC 3_____ Op-Test No.: _____

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: The plant is operating at 75% power near the end of the current fuel cycle. CBP B is being restored to service following corrective maintenance. It is a red light day and the dispatcher has requested that power be raised to maximum. SLC pump 1A is out of service to replace the discharge relief valve.

Turnover: Crew is to Start CBP B and continue power ascension. TS for SLC pump LCO is included.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Start Condensate Booster Pump B
2		R	Raise Power using RR
3	1	I	RRMG A controller failure to maximum
4	2	C	Loss RCIC 125 VDC
5	3	M	Lowering Main Condenser Vacuum resulting in Scram and Turbine trip Required
6		R	Emergency Power reduction to maintain Vacuum
7	4	C	When Reactor is Scrammed both Reactor Feed pumps trip
8	5	M	When turbine tripped Loss of Offsite power occurs. EDG #2 fails to start and can not be started from the Control room and 4160F lock out occurs due to a fault on the bus. This results in a Station black Out.
9	6	C	HPCI oil system fails (leak) resulting in HPCI unavailable to inject to RPV

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

Appendix D **Scenario Outline** **Form ES-D-1**

Facility: Cooper Nuclear Station Scenario No.: NRC 4 (**SPARE**) Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: The plant is operating at 90% power with no equipment out of service.

Turnover: After the crew has assumed the watch, Start 1B CRD Pump and secure 1A CRD Pump to allow maintenance on the motor.

Event No.	Malf. No.	Event Type*	Event Description
1.		N	Swap CRD Pumps
2.	1	C	RCIC Steam Leak and Manual Isolation of RCIC
3.	2	I	Oscillating Feedwater Flow Instrument
4.	3	C	Condensate booster pump trip
5.		R	Emergency Power Reduction
6.	4	C	A Reactor Recirc Pump Trip
7.	5	C	Reactor Recirc Pump Seal Failure
8.	6	M	Large LOCA
9.	7	C	Core Spray Valves Fail to Auto Open
10.	8	C	RHR pumps fail to Auto Start
11.		M	Emergency Depressurization due to low level.

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