

DC Cook 2012 NRC Examination

ES-301

Administrative Topics Outline

Form ES-301-1

Facility: <u>DC Cook</u>		Date of Examination: <u>7/23/2012</u>
Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/>		Operating Test Number: <u>NRC RO28</u>
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M-R	2012 NRC -A1a - SRO Review a Thermal Power Calculation KA 2.1.43 4.1/4.3
Conduct of Operations	D-R	2012 NRC - A1b Determine Ultimate Heat Sink Temperature KA 2.1.7 4.4/4.7
Equipment Control	P-D-R 2010-A2	2012 NRC - A2 – SRO Review Unit 2 LTOP Verification KA 2.2.42 3.9/4.6
Radiation Control	D-S	2012 NRC - A3 Perform A Containment Purge Release K/A 2.3.11 3.8/4.3
Emergency Procedures/Plan	M-R	2012 NRC - A4 - SRO Prepare Prompt NRC Notification Worksheet K/A 2.4.30 2.7/4.1
<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> <ul style="list-style-type: none"> (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) 		

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Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: <u>NRC RO28</u>
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M-R	2012 NRC - A1a - RO Perform a Thermal Power Calculation KA 2.1.43 4.1/4.3
Conduct of Operations	D-R	2012 NRC - A1b Determine Ultimate Heat Sink Temperature KA 2.1.7 4.4/4.7
Equipment Control	P-D-R 2008-A2	2012 NRC - A2 - RO Perform Unit 2 LTOP Verification KA 2.2.37 3.6/4.6
Radiation Control	D-S	2012 NRC - A3 Perform A Containment Purge Release K/A 2.3.11 3.8/4.3
Emergency Procedures/Plan		
<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> <ul style="list-style-type: none"> (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) 		

DC Cook 2012 NRC Examination

ES-301

Control Room/In-Plant Systems Outline

Form ES-301-2

Facility: <u>DC Cook</u>		Date of Examination: <u>7/23/2012</u>
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>NRC RO28</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. 2012 NRC-SIM01 – Perform RCCA Operability Check KA 014 A4.02 3.4/3.2	D-S	1
b. 2012 NRC-SIM02 – Isolate SI Accumulators KA 006 A4.02 4.0/3.8	M-EN-L-S	2
c. 2012 NRC-SIM03 – Perform SG Stop Valve Dump Valve Test KA 039 K4.05 3.7/3.7	D-P-S 2010	4S
d. 2012 NRC-SIM04 – Place Hydrogen Recombiner In Service KA 028 A4.01 4.0/4.0	D-L-S	5
e. 2012 NRC-SIM05 – Restore RCP Bus 1A Power to Bus T11A KA 062 A4.07 3.1/3.1	D-EN-L-P-S 2008	6
f. 2012 NRC-SIM06 – Control Room Vent Alignment for Unit 2 SI KA 072 A3.01 2.9/3.1	D-EN-S	7
g. 2012 NRC-SIM07 – Respond to a Unit 2 Plant Air Header Leak (Alt. Path) KA 078 A3.01 3.1/3.2	A-N-S	8
h. 2012 NRC-SIM08 – Respond to R-19 SG Blowdown RMS Hi Alarm (Alt. Path) KA 068 A2.04 3.3/3.3	A-N-S	9
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. 2012 NRC-INP01 – Locally Control VCT Makeup Valve (QRV-400) KA APE 068 AA1.08 4.2/4.2	E-D-P-R 2010	2
j. 2012 NRC-INP02 – Restore an 'N' Train Battery Charger (Alt. Path) KA APE 058 AA1.01 3.4/3.5	A-D-E-R	6
k. 2012 NRC-INP03 – Response to Waste Gas Panel Alarm – Tk Full (Alt. Path) KA 071 A4.14 2.8/3.0	A-D-R	9
<p>[@] 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.</p>		
* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path (C)ontrol room (D)irect from bank (E)mergency or abnormal in-plant (EN)gineered safety feature (L)ow-Power / Shutdown (N)ew or (M)odified from bank including 1(A) (P)revious 2 exams (R)CA (S)imulator	<p align="center">4-6 / 4-6 / 2-3</p> <p align="center">≤ 9 / ≤ 8 / ≤ 4</p> <p align="center">≥ 1 / ≥ 1 / ≥ 1</p> <p align="center">- / - / ≥1 (control room system)</p> <p align="center">≥ 1 / ≥ 1 / ≥ 1</p> <p align="center">≥ 2 / ≥ 2 / ≥ 1</p> <p align="center">≤ 3 / ≤ 3 / ≤ 2 (randomly selected)</p> <p align="center">≥ 1 / ≥ 1 / ≥ 1</p>	

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Control Room/In-Plant Systems Outline

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Facility: <u>DC Cook</u>		Date of Examination: <u>7/23/2012</u>
Exam Level: RO <input type="checkbox"/>	SRO-I <input checked="" type="checkbox"/>	SRO-U <input type="checkbox"/>
		Operating Test No.: <u>NRC RO28</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. 2012 NRC-SIM01 – Perform RCCA Operability Check KA 014 A4.02 3.4/3.2	D-S	1
b. 2012 NRC-SIM02 – Isolate SI Accumulators KA 006 A4.02 4.0/3.8	M-EN-L-S	2
c.		
d. 2012 NRC-SIM04 – Place Hydrogen Recombiner In Service KA 028 A4.01 4.0/4.0	D-L-S	5
e. 2012 NRC-SIM05 – Restore RCP Bus 1A Power to Bus T11A KA 062 A4.07 3.1/3.1	D-EN-L-P-S 2008	6
f. 2012 NRC-SIM06 – Control Room Vent Alignment for Unit 2 SI KA 072 A3.01 2.9/3.1	D-EN-S	7
g. 2012 NRC-SIM07 – Respond to a Unit 2 Plant Air Header Leak (Alt. Path) KA 078 A3.01 3.1/3.2	A-N-S	8
h. 2012 NRC-SIM08 – Respond to R-19 SG Blowdown RMS Hi Alarm (Alt. Path) KA 068 A2.04 3.3/3.3	A-N-S	9
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. 2012 NRC-INP01 – Locally Control VCT Makeup Valve (QRV-400) KA APE 068 AA1.08 4.2/4.2	E-D-P-R 2010	2
j. 2012 NRC-INP02 – Restore an 'N' Train Battery Charger (Alt. Path) KA APE 058 AA1.01 3.4/3.5	A-D-E-R	6
k. 2012 NRC-INP03 – Response to Waste Gas Panel Alarm – Tk Full (Alt. Path) KA 071 A4.14 2.8/3.0	A-D-R	9
<p>[@] 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.</p>		
* 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		

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Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>		Operating Test No.: <u>NRC RO28</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.		
b. 2012 NRC-SIM02 – Isolate SI Accumulators KA 006 A4.02 4.0/3.8	M-EN-L-S	2
c.		
d.		
e.		
f. 2012 NRC-SIM06 – Control Room Vent Alignment for Unit 2 SI KA 072 A3.01 2.9/3.1	D-EN-S	7
g. 2012 NRC-SIM07 – Respond to a Unit 2 Plant Air Header Leak (Alt. Path) KA 078 A3.01 3.1/3.2	A-N-S	8
h.		
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i.		
j. 2012 NRC-INP02 – Restore an 'N' Train Battery Charger (Alt. Path) KA APE 058 AA1.01 3.4/3.5	A-D-E-R	6
k. 2012 NRC-INP03 – Response to Waste Gas Panel Alarm – Tk Full (Alt. Path) KA 071 A4.14 2.8/3.0	A-D-R	9
<p>@ 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.</p>		
* 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: <u>DC Cook</u>		Date of Exam: <u>07/23/2012</u>						Operating Test No.: <u>Crew 1</u>									
A P P L I C A N T	E V E N T T Y P E	Scenarios												T O T A L	M I N I M U M(*)		
		NRC2012-01			NRC2012-02												
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P		R	I	U
<input type="checkbox"/> RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>	RX	1			1									2	1	1	0
	NOR	1			1									2	1	1	1
	I/C	4			4									8	4	4	2
	MAJ	1			1									2	2	2	1
	TS	3			4									7	0	2	2
<input type="checkbox"/> RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX		1			0								1	1	1	0
	NOR		0			1								1	1	1	1
	I/C		2			2								4	4	4	2
	MAJ		1			1								2	2	2	1
	TS		0			0								0	0	2	2
<input type="checkbox"/> RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX			0		1								1	1	1	0
	NOR			1		0								1	1	1	1
	I/C			2		2								4	4	4	2
	MAJ			1		1								2	2	2	1
	TS			0		0								0	0	2	2
<input type="checkbox"/> RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX													0	1	1	0
	NOR													0	1	1	1
	I/C													0	4	4	2
	MAJ													0	2	2	1
	TS													0	0	2	2

Instructions:

- 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.
- 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.
- 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: <u>DC Cook</u>		Date of Exam: <u>07/23/2012</u>			Operating Test No.: <u>Crew 2</u>														
A P P L I C A N T	E V E N T T Y P E	Scenarios												T O T A L	M I N I M U M (*)				
		NRC2012-01			NRC2012-03														
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N								
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P						
<input type="checkbox"/> RO	RX	1			1											2	1	1	0
<input type="checkbox"/> SRO-I	NOR	1			1											2	1	1	1
<input type="checkbox"/> SRO-U	I/C	4			4											8	4	4	2
<input checked="" type="checkbox"/> SRO-U	MAJ	1			2											3	2	2	1
	TS	3			3											6	0	2	2
<input type="checkbox"/> RO	RX		1			0										1	1	1	0
<input checked="" type="checkbox"/> SRO-I	NOR		0			1										1	1	1	1
<input type="checkbox"/> SRO-U	I/C		2			2										4	4	4	2
<input type="checkbox"/> SRO-U	MAJ		1			2										3	2	2	1
	TS		0			0										0	0	2	2
<input checked="" type="checkbox"/> RO	RX			0		1										1	1	1	0
<input checked="" type="checkbox"/> SRO-I	NOR			1		0										1	1	1	1
<input type="checkbox"/> SRO-U	I/C			2		2										4	4	4	2
<input type="checkbox"/> SRO-U	MAJ			1		2										3	2	2	1
	TS			0		0										0	0	2	2
<input type="checkbox"/> RO	RX															0	1	1	0
<input type="checkbox"/> SRO-I	NOR															0	1	1	1
<input type="checkbox"/> SRO-U	I/C															0	4	4	2
<input type="checkbox"/> SRO-U	MAJ															0	2	2	1
	TS															0	0	2	2
Instructions:																			
<p>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 <i>additionally</i> serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.</p> <p>2. Reactivity manipulations may be conducted under normal or <i>controlled</i> 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.</p> <p>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.</p>																			

Facility: <u>DC Cook</u>		Date of Exam: <u>07/23/2012</u>						Operating Test No.: <u>Crew 3</u>									
A P P L I C A N T	E V E N T T Y P E	Scenarios												T O T A L	M I N I M U M(*)		
		NRC2012-01			NRC2012-04												
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P		R	I	U
<input type="checkbox"/> RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>	RX	1			1									2	1	1	0
	NOR	1			1									2	1	1	1
	I/C	4			4									8	4	4	2
	MAJ	1			1									2	2	2	1
	TS	3			3									6	0	2	2
<input type="checkbox"/> RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX		1			0								1	1	1	0
	NOR		0			1								1	1	1	1
	I/C		2			2								4	4	4	2
	MAJ		1			1								2	2	2	1
	TS		0			0								0	0	2	2
<input type="checkbox"/> RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX			0		1								1	1	1	0
	NOR			1		0								1	1	1	1
	I/C			2		2								4	4	4	2
	MAJ			1		1								2	2	2	1
	TS			0		0								0	0	2	2
<input type="checkbox"/> RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX													0	1	1	0
	NOR													0	1	1	1
	I/C													0	4	4	2
	MAJ													0	2	2	1
	TS													0	0	2	2

Instructions:

- 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.
- 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.
- 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: <u>DC Cook</u>		Date of Exam: <u>07/23/2012</u>			Operating Test No.: <u>Crew 4</u>													
A P P L I C A N T	E V E N T T Y P E	Scenarios												T O T A L	M I N I M U M (*)			
		NRC2012-02			NRC2012-03			NRC2012-04										
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N							
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P					
<input type="checkbox"/> RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/> SRO-U	RX	1				1			1						3	1	1	0
	NOR	1				0			1						2	1	1	1
	I/C	4				2			4						10	4	4	2
	MAJ	1				2			1						4	2	2	1
	TS	4				0			3						7	0	2	2
<input type="checkbox"/> RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/> SRO-U	RX		1		1						0				2	1	1	0
	NOR		0		1						1				2	1	1	1
	I/C		2		4						1				7	4	4	2
	MAJ		1		2						1				4	2	2	1
	TS		0		3						0				3	0	2	2
<input type="checkbox"/> RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/> SRO-U	RX			0			0			1					1	1	1	0
	NOR			1			1			0					2	1	1	1
	I/C			2			2			2					6	4	4	2
	MAJ			1			2			1					4	2	2	1
	TS			0			0			0					0	0	2	2
<input type="checkbox"/> RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/> SRO-U	RX														0	1	1	0
	NOR														0	1	1	1
	I/C														0	4	4	2
	MAJ														0	2	2	1
	TS														0	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: <u>DC Cook</u>		Date of Exam: <u>07/23/2012</u>			Operating Test No.: <u>Crew 5</u>														
A P P L I C A N T	E V E N T T Y P E	Scenarios													T O T A L	M I N I M U M (*)			
		NRC2012-02			NRC2012-03														
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N								
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P						
<input type="checkbox"/> RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	RX	1				1										2	1	1	0
	NOR	1				0										1	1	1	1
	I/C	4				2										6	4	4	2
	MAJ	1				2										3	2	2	1
	TS	4				0										4	0	2	2
<input type="checkbox"/> RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX		1				0									1	1	1	0
	NOR		0				1									1	1	1	1
	I/C		2				2									4	4	4	2
	MAJ		1				2									3	2	2	1
	TS		0				0									0	0	2	2
<input type="checkbox"/> RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX															0	1	1	0
	NOR															0	1	1	1
	I/C															0	4	4	2
	MAJ															0	2	2	1
	TS															0	0	2	2
<input type="checkbox"/> RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX															0	1	1	0
	NOR															0	1	1	1
	I/C															0	4	4	2
	MAJ															0	2	2	1
	TS															0	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: Cook Nuclear Plant

Printed: 04/23/2012

Date Of Exam: 08/03/2012

Tier	Group	RO K/A Category Points											SRO-Only Points					
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2		G*	Total	
1. Emergency & Abnormal Plant Evolutions	1	0	0	0	N/A			0	0	N/A			0	0	3		3	6
	2	0	0	0				0	0				0	0	2		2	4
	Tier Totals	0	0	0				0	0				0	0	0	5		5
2. Plant Systems	1	0	0	0	0	0	0	0	0	0	0	0	0	3		2	5	
	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	
	Tier Totals	0	0	0	0	0	0	0	0	0	0	0	0	5		3	8	
3. Generic Knowledge And Abilities Categories				1		2		3		4		0		1	2	3	4	7
				0		0		0		0				2	1	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/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 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. Refer to Section D.1.b of ES-401 for the applicable K/As.
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.

PWR SRO Examination Outline

Printed: 04/23/2012

Facility: Cook Nuclear Plant

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000007 Reactor Trip - Stabilization - Recovery / 1						X	2.2.38 - Knowledge of conditions and limitations in the facility license.	4.5	1
000022 Loss of Rx Coolant Makeup / 2					X		AA2.01 - Whether charging line leak exists	3.8	1
000054 Loss of Main Feedwater / 4					X		AA2.06 - AFW adjustments needed to maintain proper T-ave. and S/G level	4.3	1
000055 Station Blackout / 6						X	2.4.35 - Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.	4.0	1
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.4	1
W/E12 - Steam Line Rupture - Excessive Heat Transfer / 4						X	2.1.32 - Ability to explain and apply system limits and precautions.	4.0	1
K/A Category Totals:	0	0	0	0	3	3	Group Point Total:	6	

PWR SRO Examination Outline

Printed: 04/23/2012

Facility: Cook Nuclear Plant

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000032 Loss of Source Range NI / 7					X		AA2.06 - Confirmation of reactor trip	4.1*	1
000067 Plant Fire On-site / 9						X	2.4.50 - Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	4.0	1
W/E02 SI Termination / 3						X	2.4.18 - Knowledge of the specific bases for EOPs.	4.0	1
W/E07 Inad. Core Cooling / 4					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.9	1
K/A Category Totals:	0	0	0	0	2	2	Group Point Total:	4	

PWR SRO Examination Outline

Printed: 04/23/2012

Facility: Cook Nuclear Plant

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
004 Chemical and Volume Control											X	2.2.22 - Knowledge of limiting conditions for operations and safety limits.	4.7	1
008 Component Cooling Water								X				A2.09 - Results of excessive exit temperature from the letdown cooler, including the temperature effects on ion-exchange resins	2.8	1
010 Pressurizer Pressure Control								X				A2.02 - Spray valve failures	3.9	1
012 Reactor Protection											X	2.2.37 - Ability to determine operability and/or availability of safety related equipment.	4.6	1
076 Service Water								X				A2.01 - Loss of SWS	3.7*	1
K/A Category Totals:	0	0	0	0	0	0	0	3	0	0	2	Group Point Total:	5	

PWR SRO Examination Outline

Printed: 04/23/2012

Facility: Cook Nuclear Plant

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
002 Reactor Coolant								X				A2.04 - Loss of heat sinks	4.6	1
017 In-core Temperature Monitor								X				A2.01 - Thermocouple open and short circuits	3.5	1
041 Steam Dump/Turbine Bypass Control											X	2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm.	4.3	1
K/A Category Totals:	0	0	0	0	0	0	0	2	0	0	1	Group Point Total:	3	

Generic Knowledge and Abilities Outline (Tier 3)

PWR SRO Examination Outline

Printed: 04/23/2012

Facility: Cook Nuclear Plant

Form ES-401-3

<u>Generic Category</u>	<u>KA</u>	<u>KA Topic</u>	<u>Imp.</u>	<u>Points</u>
Conduct of Operations	2.1.6	Ability to manage the control room crew during plant transients.	4.8	1
	2.1.35	Knowledge of the fuel-handling responsibilities of SROs.	3.9	1
	Category Total:			2
Equipment Control	2.2.40	Ability to apply Technical Specifications for a system.	4.7	1
	Category Total:			1
Radiation Control	2.3.6	Ability to approve release permits.	3.8	1
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.8	1
	Category Total:			2
Emergency Procedures/Plan	2.4.8	Knowledge of how abnormal operating procedures are used in conjunction with EOPs.	4.5	1
	2.4.29	Knowledge of the emergency plan.	4.4	1
	Category Total:			2
Generic Total:				7

Facility: Cook Nuclear Plant

Printed: 04/23/2012

Date Of Exam: 08/03/2012

Tier	Group	RO K/A Category Points											SRO-Only Points					
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2		G*	Total	
1. Emergency & Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A			3	18	0		0	0
	2	2	1	2	N/A			1	1	N/A			2	9	0		0	0
	Tier Totals	5	4	5	N/A			4	4	N/A			5	27	0		0	0
2. Plant Systems	1	2	2	3	3	3	2	2	3	2	3	3	28	0		0	0	
	2	1	1	1	1	1	1	1	1	0	1	1	10	0	0	0	0	
	Tier Totals	3	3	4	4	4	3	3	4	2	4	4	38	0		0	0	
3. Generic Knowledge And Abilities Categories				1		2		3		4		10	1		2	3	4	0
				3		2		2		3			0		0	0	0	

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/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 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. Refer to Section D.1.b of ES-401 for the applicable K/As.
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.

PWR RO Examination Outline

Printed: 04/23/2012

Facility: Cook Nuclear Plant

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000008 Pressurizer Vapor Space Accident / 3	X						AK1.02 - Change in leak rate with change in pressure	3.1	1
000009 Small Break LOCA / 3					X		EA2.24 - RCP temperature setpoints	2.6	1
000011 Large Break LOCA / 3			X				EK3.13 - Hot-leg injection/recirculation	3.8	1
000015/000017 RCP Malfunctions / 4		X					AK2.08 - CCWS	2.6	1
000025 Loss of RHR System / 4				X			AA1.08 - RHR cooler inlet and outlet temperature indicators	2.9*	1
000026 Loss of Component Cooling Water / 8			X				AK3.04 - Effect on the CCW flow header of a loss of CCW	3.5	1
000027 Pressurizer Pressure Control System Malfunction / 3					X		AA2.03 - Effects of RCS pressure changes on key components in plant	3.3	1
000029 ATWS / 1		X					EK2.06 - Breakers, relays, and disconnects	2.9*	1
000038 Steam Gen. Tube Rupture / 3	X						EK1.01 - Use of steam tables	3.1	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4						X	2.1.7 - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	1
000056 Loss of Off-site Power / 6				X			AA1.07 - Service water pump	3.2*	1
000057 Loss of Vital AC Inst. Bus / 6					X		AA2.18 - The indicator, valve, breaker, or damper position which will occur on a loss of power	3.1	1
000058 Loss of DC Power / 6				X			AA1.02 - Static inverter dc input breaker, frequency meter, ac output breaker, and ground fault detector	3.1*	1
000062 Loss of Nuclear Svc Water / 4			X				AK3.03 - Guidance actions contained in EOP for Loss of nuclear service water	4.0	1
000065 Loss of Instrument Air / 8						X	2.1.32 - Ability to explain and apply system limits and precautions.	3.8	1
000077 Generator Voltage and Electric Grid Disturbances / 6	X						AK1.03 - Under-excitation	3.3	1
W/E04 LOCA Outside Containment / 3		X					EK2.2 - Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility	3.8	1
W/E11 Loss of Emergency Coolant Recirc. / 4						X	2.1.32 - Ability to explain and apply system limits and precautions.	3.8	1

PWR RO Examination Outline

Printed: 04/23/2012

Facility: Cook Nuclear Plant

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
K/A Category Totals:	3	3	3	3	3	3	Group Point Total:		18

PWR RO Examination Outline

Printed: 04/23/2012

Facility: Cook Nuclear Plant

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000036 Fuel Handling Accident / 8	X						AK1.01 - Radiation exposure hazards	3.5	1
000059 Accidental Liquid RadWaste Rel. / 9						X	2.4.31 - Knowledge of annunciator alarms, indications, or response procedures.	4.2	1
000061 ARM System Alarms / 7				X			AA1.01 - Automatic actuation	3.6	1
000076 High Reactor Coolant Activity / 9						X	2.1.30 - Ability to locate and operate components, including local controls.	4.4	1
W/E03 LOCA Cooldown - Depress. / 4	X						EK1.2 - Normal, abnormal and emergency operating procedures associated with LOCA Cooldown and Depressurization	3.6	1
W/E06 Inad. Core Cooling / 4			X				EK3.1 - Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics	3.4	1
W/E08 RCS Overcooling - PTS / 4		X					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.4	1
W/E14 Loss of CTMT Integrity / 5					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.3	1
W/E15 Containment Flooding / 5			X				EK3.2 - Normal, abnormal and emergency operating procedures associated with Containment Flooding	2.8	1
K/A Category Totals:	2	1	2	1	1	2	Group Point Total: 9		

PWR RO Examination Outline

Printed: 04/23/2012

Facility: Cook Nuclear Plant

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
003 Reactor Coolant Pump						X						K6.04 - Containment isolation valves affecting RCP operation	2.8	1
003 Reactor Coolant Pump										X		A4.01 - Seal injection	3.3	1
004 Chemical and Volume Control				X								K4.12 - Minimum level of VCT	3.1	1
005 Residual Heat Removal				X								K4.11 - Lineup for low head recirculation mode (external and internal)	3.5*	1
006 Emergency Core Cooling		X										K2.01 - ECCS pumps	3.6	1
006 Emergency Core Cooling											X	2.1.27 - Knowledge of system purpose and/or function.	3.9	1
007 Pressurizer Relief/Quench Tank								X				A2.01 - Stuck-open PORV or code safety	3.9	1
008 Component Cooling Water	X											K1.03 - PRMS	2.8*	1
010 Pressurizer Pressure Control		X										K2.01 - PZR heaters	3.0	1
012 Reactor Protection				X								K4.05 - Spurious trip protection	2.7	1
013 Engineered Safety Features Actuation					X							K5.01 - Definitions of safety train and ESF channel	2.8	1
022 Containment Cooling			X									K3.01 - Containment equipment subject to damage by high or low temperature, humidity, and pressure	2.9*	1
025 Ice Condenser					X							K5.02 - Heat transfer	2.6*	1
026 Containment Spray			X									K3.02 - Recirculation spray system	4.2*	1
026 Containment Spray										X		A4.01 - CSS controls	4.5	1
039 Main and Reheat Steam									X			A3.02 - Isolation of the MRSS	3.1	1
039 Main and Reheat Steam										X		A4.03 - MFW pump turbines	2.8*	1
059 Main Feedwater								X				A2.07 - Tripping of MFW pump turbine	3.0*	1
061 Auxiliary/Emergency Feedwater							X					A1.04 - AFW source tank level	3.9	1
062 AC Electrical Distribution	X											K1.03 - DC distribution	3.5	1
063 DC Electrical Distribution								X				A2.01 - Grounds	2.5	1
064 Emergency Diesel Generator						X						K6.08 - Fuel oil storage tanks	3.2	1
073 Process Radiation Monitoring											X	2.4.49 - Ability to perform without reference to procedures those actions that	4.6	1

PWR RO Examination Outline

Printed: 04/23/2012

Facility: Cook Nuclear Plant

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
												require immediate operation of system components and controls.		
073 Process Radiation Monitoring					X							K5.03 - Relationship between radiation intensity and exposure limits	2.9*	1
076 Service Water			X									K3.01 - Closed cooling water	3.4*	1
078 Instrument Air									X			A3.01 - Air pressure	3.1	1
103 Containment							X					A1.01 - Containment pressure, temperature, and humidity	3.7	1
103 Containment											X	2.4.1 - Knowledge of EOP entry conditions and immediate action steps.	4.6	1
K/A Category Totals:	2	2	3	3	3	2	2	3	2	3	3		Group Point Total:	28

PWR RO Examination Outline

Printed: 04/23/2012

Facility: Cook Nuclear Plant

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
001 Control Rod Drive					X							K5.30 - Effects of fuel burnout on reactivity in the core	2.9	1
015 Nuclear Instrumentation											X	2.2.37 - Ability to determine operability and/or availability of safety related equipment.	3.6	1
028 Hydrogen Recombiner and Purge Control		X										K2.01 - Hydrogen recombiners	2.5*	1
029 Containment Purge	X											K1.01 - Gaseous radiation release monitors	3.4	1
033 Spent Fuel Pool Cooling				X								K4.03 - Anti-siphon devices	2.6	1
034 Fuel Handling Equipment						X						K6.02 - Radiation monitoring systems	2.6	1
056 Condensate								X				A2.04 - Loss of condensate pumps	2.6	1
071 Waste Gas Disposal										X		A4.10 - WGDS sampling	2.5*	1
072 Area Radiation Monitoring							X					A1.01 - Radiation levels	3.4	1
086 Fire Protection			X									K3.01 - Shutdown capability with redundant equipment	2.7	1
K/A Category Totals:	1	1	1	1	1	1	1	1	0	1	1	Group Point Total:	10	

Generic Knowledge and Abilities Outline (Tier 3)

PWR RO Examination Outline

Printed: 04/23/2012

Facility: Cook Nuclear Plant

Form ES-401-3

<u>Generic Category</u>	<u>KA</u>	<u>KA Topic</u>	<u>Imp.</u>	<u>Points</u>
Conduct of Operations	2.1.4	Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc.	3.3	1
	2.1.5	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.	2.9*	1
	2.1.36	Knowledge of procedures and limitations involved in core alterations.	3.0	1
	Category Total:			3
Equipment Control	2.2.36	Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.	3.1	1
	2.2.42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	1
	Category Total:			2
Radiation Control	2.3.13	Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	3.4	1
	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9	1
	Category Total:			2
Emergency Procedures/Plan	2.4.6	Knowledge of EOP mitigation strategies.	3.7	1
	2.4.31	Knowledge of annunciator alarms, indications, or response procedures.	4.2	1
	2.4.49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.6	1
	Category Total:			3
Generic Total:			10	

Facility: Cook Plant Unit 1 & Unit 2 Scenario No: NRC2012-01 Op-Test No.: Crews 1, 2, & 3

Examiners: _____

Operators: _____

Initial Conditions: IC- , 1-3% pwr, ppm Boron, GWD, °F Tavg, CBD @ steps, 0 MW

Turnover: Start the Middle Condensate Booster Pump, Raise Power to 3-4% for MFW Pump Start-up

Event No.	Malf. No.	Event Type*	Event Description
1		N-BOP	Start the Middle Condensate Booster Pump.
2		R-RO	Raise Power to 3-4% Power.
3	QLC451 @ 100	I-RO TS	VCT Level Transmitter (QLC-451) Fails HIGH.
4	ED07A	C-RO TS	PZR HTR Transformer Fails (11PHA Fails).
5	CLC10 to 0%	I-BOP	Hotwell Level Transmitter CLC-10 Fails LOW.
6	RX11D @100%	C-BOP TS	SG PORV Controller Failure.
7	ED01 ED25 ED03A EG06B	M	Loss of All AC Power. 1CD EDG Trip.
8	EG08A	C-BOP	1AB EDG Speed Governor Failure.
9	FW48C	C-BOP	TD AFW Pump Fails to AUTO start.

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

The BOP is directed to start the Middle Condensate Booster Pump (CBP). The operator will place the Middle CBP in service in accordance with the normal operating procedure.

The Crew is directed to raise power to 3-4% for MFW Pump Start-up.

The third event will involve the VCT Level instrument (QLC-451) failing HIGH. This will result in the VCT High Level alarm. The RO will be required to perform a manual makeup to the RCS. The Crew will be required to implement AOP actions to stabilize the plant and trip bistables.

A failure of the PZR HTR Bus 11PHA will occur. The PZR SCR heater control will need to be transferred to 11PHC. The crew should also refer to Technical Specifications.

Then the Hotwell Level Transmitter CLC-10 fails LOW. The low failure will cause the Condensate Makeup valve (CRV-55) to fully open and the Condensate Letdown Valve (CRV-155) to fully close causing a rise in actual hotwell level. The BOP will be required to take manual control of the Hotwell Level Controller and return hotwell level to a normal band. The non failed hotwell level input may be selected for subsequent auto control.

The next event will involve the failure of the SG #14 PORV Controller. The controller will fail causing PORV 1-MRV-243 to fully open. This will also cause Reactor power to slightly rise. The BOP will need to take manual action to close the PORV and the US will need to declare the associated radiation monitor inoperable.

The Major event is a loss of all AC power. The reactor will trip. Failure of the EDGs will require entry into ECA-0.0 actions. Failure of the TDAFW Pump to auto start will require a manual start to restore feedwater flow. The crew will be required to take actions to restore Emergency Power (EP). The crew should transition to ECA-0.1 once power has been restored to one Safeguards Bus. The scenario will terminate when the crew has restored emergency power and transitioned to ECA-0.1 or ECA-0.2.

Critical Tasks

- Establish AFW (Start TDAFWP)
- Restore Emergency Power to Safeguards Bus

Procedures

- E-0, Reactor Trip or Safety Injection
- ECA-0.0, Loss of All AC Power

Facility: Cook Plant Unit 1 & Unit 2 Scenario No.: NRC2012-02 Op-Test No.: Crews 1, 4, & 5

Examiners: _____

Operators: _____

Initial Conditions: IC- _____, 100% pwr; _____ ppm Boron, GWD, _____ °F Tav_g, CBD @ _____ steps,
 1107 MW

Turnover: Lower SI Accumulator Pressure and then lower power to 95% for water box cleaning

Event No.	Malf. No.	Event Type*	Event Description
1		N BOP	Lower SI Accumulator #3 Pressure to Within Notification Limits.
2		R RO	Lower Turbine and Reactor Power.
3	NLP151 @ 0%	I-RO TS	Controlling Pressurizer Level Channel (NLP-151) Fails LOW.
4	RH09B	C-BOP TS	West RHR Pump Suction Strainer Cap Leak.
5	RC17C to 50%	C-RO TS	Pressurizer PORV NRV-153 Opens.
6	FFC220 @ 4E6	I-BOP TS	SG #2 Feed Flow Instrument (FFC-220) Fails HIGH.
7	RC01D to 20% over 5 min ramp	M	Loop 4 Cold Leg Primary Coolant System Leak Inside Containment.
8	101ICM305	C-ALL	Loss of Recirc Sump Capability.
9	RP13A RP13B RP14A	C-BOP	Phase A Train A & B Fails to Automatically Actuate. Phase A Train A Fails to Manually Actuate.

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

Event Summary
(NRC2012-02)

The BOP is directed to Lower SI Accumulator Pressure to within limits. After the SI Accumulator Pressure has been restored, the crew is required to respond to various events.

If required, the crew will be directed by the Shift Manager to lower power.

While reducing power, the controlling Pressurizer Level channel NLP-151 fails LOW. Charging flow control valve (QRV-251) opens to raise charging flow which causes actual pressurizer level to rise. Pressurizer water level low alarm comes in, a letdown isolation occurs, and all pressurizer heaters will de-energize. The RO will need to take manual control of the Pressurizer Level controller and restore level. The crew should implement the AOP, stabilize the plant, trip bistables, select an operable channel, and restore level control to auto.

While the RO is restoring letdown, leakage on the RHR pump suction piping will require the BOP to isolate the RHR pump.

After the Crew has addressed the Tech Specs for RHR, the Pressurizer PORV NRV153 will fail partially open. This results in Actual RCS pressure lowering. The RO will be required to take manual actions to isolate the PORV (close block valve) and restore normal pressure conditions.

When the RCS Pressure has been restored a HIGH failure of #2 Steam Generator Feed Flow instrument (FFC-220) will occur. This will result in a lowering feedwater flow to #2 SG with corresponding SG level lowering. The BOP will be required to take manual control of FRV-220. Crew will be required to implement AOP actions to stabilize the plant and trip bistables.

When the SG level has stabilized, a Large Break LOCA will occur requiring a Reactor Trip and SI. On the Trip, the breaker for ICM-305 will be discovered to be without power, resulting in a Loss of Emergency Coolant Recirculation capability. On the SI, the auto Phase A Isolation will also fail requiring manual alignment of Phase A equipment. The crew should progress through E-0, E-1, and ECA-1.1. The scenario will terminate once a transition has been made back to E-1.

Critical Tasks Initiate/Isolate Phase A
 Isolate RWST Outflow

Procedures E-0 Reactor Trip or Safety Injection
 E-1 Loss of Reactor or Secondary Coolant
 ECA-1.1, Loss of Emergency Coolant Recirculation

Facility: Cook Plant Unit 1 & Unit 2 Scenario No.: NRC2012-03 Op-Test No.: Crews 2, 4, & 5

Examiners: _____

Operators: _____

Initial Conditions: IC- _____, 80 % pwr, _____ ppm Boron, _____ GWD, _____ °F Tavg, CBD @ _____ steps, _____ MW

Turnover: Swap TACW Pumps, West CCP is OOS for Oil Change this shift. Pump has been OOS for 2 Hours.

Event No.	Malf. No.	Event Type*	Event Description
1		N-BOP	Swap Turbine Aux Cooling Water (TACW) Pumps.
2	NTP240 @ 620	I-RO TS	RCS Cold Leg Temperature Instrument (NTP-240) Fails HIGH.
3	MFC130 @ 4E6 over 20 sec	I-BOP TS	#3 SG Steam Flow Transmitter (MFC-130) Fails HIGH.
4	101BAP1	C-RO TS	Boric Acid Pump Fails.
5		R-RO	Lower Reactor Power and Turbine Load (Optional).
6	FW05A	C-BOP	East Main Feed Pump Trip.
7	FW05B	M	West Main Feed Pump Trip.
8	MS01D @ 20 2 min Ramp	M	Steam Line Break Inside Containment (#3 SG).
9a	RP16B RP17B	C-RO	CTS Train B - Fails to Actuate (AUTO/MANUAL).
9b	RP19J	C-RO	RPS Relay K626-X3 Failure (East CTS Pump Fails to Start).

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

Event Summary

(NRC2012-03)

The Crew is directed to start West TACW pump and stop East TACW Pump.

The RCS Loop 4 Cold Leg Temperature instrument (NTP-240) fails HIGH. This will result in the AUTO insertion of control rods and a lower trip setpoint value for OP Δ T and OT Δ T. The RO will be required to take manual control of rods to stop insertion. The Crew will be required to implement AOP actions to stabilize the plant and trip bistables.

After the crew has addressed the RCS temperature instrument, the #3 SG Steam Flow instrument (MFC-130) fails HIGH. This will result in the opening of #3 SG FWRV (FRV-230) to raise feedwater flow. The BOP will be required to take manual control and regulate FRV-230. The Crew will be required to implement AOP actions to stabilize the plant and trip bistables.

The running Boric Acid Pump Breaker will trip. This results in a temporary loss of VCT make-up capability. The RO will be required to take manual actions to align the standby Boric Acid Pump and start it in slow speed.

Next a rapid power reduction is performed based on a report of an Oil leak on the East Main feed Pump. (Optional if reactivity change is required - note next event also involves a reactivity change which may be combined with this reactivity change)

A trip of the East Main Feed Pump will result in a rapid power reduction to less than 60% (if not already performed.) The RO will be required to control reactivity while the BOP monitors SG levels.

The main event will involve a trip of the remaining MFW pump. A Steam Line Break will cause SG #3 to blow down inside Containment. The BOP will be required to isolate the main steam lines. A SSPS failure results in failure of Train B (West) CTS and a failure of the K626-X3 relay which prevents the auto start of the East CTS pump. The crew will perform the actions of E-0 to verify the SI actions and then transition to E-2. The scenario will terminate when the crew has completed isolation of the faulted SG in E-2.

Critical Tasks

- Actuate Containment Spray
- Isolate the Faulted Steam Generator

Procedures

- E-0, Reactor Trip or Safety Injection
- E-2, Faulted Steam Generator Isolation

Facility: Cook Plant Unit 1 & Unit 2 Scenario No.: NRC2012-04 Op-Test No.: Crews 3 & 4

Examiners: _____

Operators: _____

Initial Conditions: IC- ,45-50% pwr; ppm Boron, GWD, °F Tavg, CBD @
 steps, MW

Turnover: Complete shutdown of FW Pump for repairs. NRV-153 PZR PORV is isolated for leakage.

Event No.	Malf. No.	Event Type*	Event Description
1		N-BOP	Complete Shutdown of Idle FW Pump.
2	NI10B to 0%	I-RO TS	Power Range Channel NI-42 fails LOW.
3	MPP240 to 1200 over 10 Sec	I-BOP TS	SG Pressure Channel MPP-240 Fails HIGH.
4	RC24D to 50%	C-RO TS	SG No. 4 Tube Leak of 5 gpm Requiring Shutdown.
5		R-RO	Shutdown the Reactor.
6	RX24G to 99%	C-BOP	FRV-240 Feedwater Control Valve Controller Fails OPEN in Auto.
7	RC23D to 60% (400 gpm) Ramp Time 5:00 Min	M	SG No. 4 Tube Rupture.
8a	101XCR101 101XCR103 Global	C-BOP	Train B Instrument Air to Containment XCR-101 & XCR 103 Failure(Fail to Reopen After SI Reset).
8b	RC17B 0% - Preload	C-RO	PZR PORV NRV-152 Fails to Open.

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

Event Summary
(NRC2012-04)

The plant is at 50% power and the BOP is directed to complete the shutdown of the idle FW pump.

After the crew completed the FW pump shutdown, a failure of the Power Range NI-42 will occur. The RO should identify the NI-42 failure. The crew will need to address this failure with the Abnormal Operating Procedure and address Technical Specifications.

The next event will involve the SG Pressure Channel MPP-240 fails high. The BOP will be required to take manual control SG 4 Feedwater Regulating Valve FRV-240 to stabilize level. The crew will address the failure with the Abnormal Operating Procedure, address Technical Specifications, select an operable channel, and restore automatic control.

After the pressure channel; a SG 4 Tube Leakage of 5 gpm, will require a shutdown per the Abnormal Operating Procedure.

After the crew has begun the shutdown, the Feed Regulating Valve FRV-240 on SG 4 will fail to 99% in Auto. The BOP will need to take manual control and maintain SG level during the ramp.

The SG tube leak will become worse requiring a Reactor Trip and Safety Injection. The crew should manually trip the reactor and initiate SI. The crew will progress through E-0 and transition to E-3.

The crew will progress through E-3 and discover that Instrument Air can not be restored to Containment because the Train B Isolation Valves will not re-open. This will complicate the RCS Depressurization. The scenario will be terminated once the RCS has been depressurized and the SI pumps have been stopped.

Critical Tasks

- Isolate Ruptured SG
- RCS Cooldown
- Depressurize RCS

Procedures

- E-0 Reactor Trip or Safety Injection
- E-3 Steam Generator Tube Rupture