

OUTLINE SUBMITTAL

FOR THE BRAIDWOOD INITIAL EXAMINATION - JULY 2004

Outline Submittal

Contains the following:

Outline Submittal Letter from Licensee

ES-201-2	Examination Outline Quality Checklist
ES-301-1	Administrative Topics Outline (SRO)
ES-301-2	Control Room and Facility Walk-Through Test Outline (SRO(I))
ES-301-2	Control Room and Facility Walk-Through Test Outline (SRO(U))
ES-301-5	Transient and Event Checklist
ES-401-2	PWR Examination Outline
ES-401-3	Generic Knowledge and Abilities Outline (Tier 3)
D-1	Dynamic Simulator Scenario Outline for 2 scenarios

Admin	There were no NRC Comments on the licensee submitted test outlines
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March 15, 2004
BW040029

James L. Caldwell
Regional Administrator
U.S. Nuclear Regulatory Commission
Region III
801 Warrenville Road
Lisle, IL 60532-4351

Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Subject: Submittal of Integrated Initial License Training Examination Outline

Enclosed are the examination outlines supporting the Initial License Examination scheduled for the week of July 12, 2004, through July 16, 2004, at Braidwood Station.

This submittal includes all appropriate Examination Standard forms and outlines in accordance with NUREG 1021, "Operator Licensing Examination Standards for Power Reactors," Draft Revision 9.

In accordance with NUREG 1021, Draft Revision 9, Section ES-201, "Initial Operator Licensing Examination Process," please withhold these materials from public disclosure until after the examinations are complete.

Should you have any questions concerning this letter, please contact Ms. Kelly Root, Regulatory Assurance Manager, at (815) 417-2800. For questions concerning examination outlines, please contact Robert Cameron, Training Department, at (815) 458-7694.

Respectfully,



Thomas F. Joyce
Site Vice President
Braidwood Station

Enclosures: (Hand Delivered to Dell McNeil, Chief Examiner, NRC Region 3)

Examination Security Agreements (Form ES-201-3)
Administrative Walk-Through Job Performance Measures Sample Plan (Form ES-301-1)
Control Room Systems and Facility Walk-Through Test Outline (Form ES-301-2)
PWR Examination Outline (Form ES-401-2)
Generic Knowledge and Abilities Outline (Tier 3) (Form ES-401-3)
Operational Scenarios Sample Plan (Form ES-D-1) (2 sets)
Record of Rejected K/As (Form ES-401-4)
Completed Checklists:
 Examination Outline Quality Checklist (Form ES-201-2)
 Transient and Event Checklist (Form ES-301-5)

cc: (without attachments)
Chief, NRC Operator Licensing Branch
NRC Senior Resident Inspector – Braidwood Station

bcc: Station Project Manager, NRR – Braidwood Station
Site Vice President – Braidwood Station
Regulatory Assurance Manager – Braidwood Station
Vice President – Licensing and Regulatory Affairs
Director, Licensing
Manager, Licensing – Braidwood, Byron and LaSalle County Stations
Nuclear Licensing Administrator – Braidwood and Byron Stations
Exelon Document Control Desk Licensing (Hard Copy)
Human Resources – Braidwood Station
Training Manager – Braidwood Station
Illinois Emergency Management Agency – Division of Nuclear Safety
Manager of Energy Practice – Winston & Strawn

Facility: BRAIDWOOD		Date of Examination: 7/12 - 7/16/04		
Item	Task Description	Initials		
		a	b*	c#
W R I T E N	1. a. Verify that the outline(s) fit(s) the appropriate model per ES-401.	f	g	h
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all KA categories are appropriately sampled.	f	g	h
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.	f	g	h
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.	f	g	h
S I M	2. a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, and major transients.	f	g	h
	b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity; ensure each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s)*, and scenarios will not be repeated on subsequent days.	f	g	h
	c. To the extent possible, assess whether the outline(s) conform(s) with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D.	f	g	h
W / T	3. a. Verify that: (1) the outline(s) contain(s) the required number of control room and in-plant tasks, (2) no more than 30% of the test material is repeated from the last NRC examination, (3)* no tasks are duplicated from the applicants' audit test(s), and (4) no more than 80% of any operating test is taken directly from the licensee's exam banks.	f	g	h
	b. Verify that: (1) the tasks are distributed among the safety function groupings as specified in ES-301, (2) one task is conducted in a low-power or shutdown condition, (3) 4-6 (2-3 for SRO-U) of the tasks require the applicant to implement an alternate path procedure, (4) one in-plant task tests the applicant's response to an emergency or abnormal condition, and (5) the in-plant walk-through requires the applicant to enter the RCA.	f	g	h
	c. Verify that the required administrative topics are covered.	f	g	h
	d. Determine if there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on subsequent days.	f	g	h
G E N E R A L	4. a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam section.	f	g	h
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.	f	g	h
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	f	g	h
	d. Check for duplication and overlap among exam sections.	f	g	h
	e. Check the entire exam for balance of coverage.	f	g	h
	f. Assess whether the exam fits the appropriate job level (RO or SRO).	f	g	h
a. Author	<u>R. M. CAMERON / [Signature]</u>	Printed Name / Signature		Date
b. Facility Reviewer (*)	<u>A. Ackerman / [Signature]</u>			<u>3-12-2004</u>
c. NRC Chief Examiner (#)	<u>D. McNeil / [Signature]</u>			<u>3-12-2004</u>
d. NRC Supervisor	<u>ROD Lankford / [Signature]</u>			<u>3/16/04</u>
NOTE: * Not applicable for NRC-developed examinations. # Independent NRC Reviewer initial items in Column "c" chief examiner concurrence required.				

Facility: BraidwoodDate of Examination: 7/12-7/16/04Examination Level (circle one): RO **(SRO)**Operating Test Number: 2004301

Administrative Topic (See Note)	Describe activity to be performed
Conduct of Operations	S-103 NEW Call out for Shift Staffing K/A 2.1.5 Imp Factor 3.4
Conduct of Operations	S-104 NEW Review Mode Change Checklist Step K/A 2.1.22 Imp Factor 3.3
Equipment Control	S-201 Fill Out LCOAR Paperwork K/A 2.2.23 Imp Factor 3.8
Radiation Control	S-302 NEW Review Waste Gas Decay Tank Release K/A 2.3.11 Imp Factor 3.2
Emergency Plan	S-408 NEW Classify Event K/A 2.4.38 Imp Factor 4.0

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

Facility: BraidwoodDate of Examination: 7/12-7/16/04Exam Level (circle one): RO **SRO(I)** SRO(U)Operating Test Number: 2004301

Control Room Systems (8 for RO, 7 for SRO-I, 2 or 3 for SRO-U)

System / JPM Title	Type Code*	Safety Function
a. CVCS / Perform 50 ppm dilution with 1CV111A failure SIM-106 K/A 004A4.07 3.9/3.7	D, A, S	1
b. ECCS / Raise SI Accumulator Level with 1B SI pump (NOP) SIM-203 K/A 006A1.13 3.5/3.7	D, S	2
c. RCP / RCP Seal Inj Monthly SIM-P403 K/A 003A4.01 3.3/3.2	D, A, S	4P
d. TG / Respond to Main Generator Field Forcing SIM-S409 K/A 045A4.02 2.7/2.6	N, S	4S
e. CS / Start C/S pump using Attachment B SIM-505 K/A 026A3.01 4.3/4.5	N, A, S, L	5
f. EDG / Synchronize a SAT to a bus being fed by a Diesel SIM-601 K/A 064A4.09 3.2/3.3	D, S	6
g. CC / Respond to a Thermal Barrier HX Leak SIM-801 K/A 008A3.03 3.0/3.1	D, A, S	8
h. N/A	N/A	N/A

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

i. ESFAS / ESFAS Slave Relay surveillance (K611) IP-202 K/A 013A3.01 3.7/3.9	D	2
j. SWS / Align FP to 2A CV pump (Abnormal) (PRA) IP-S407 K/A APE062AK3.03 4.0/4.2	D, R	4S
k. AC ELEC / Respond to a Loss of an Instrument Bus (Instrument Bus Inverter Startup) IP-603 K/A APE057AA1.01 3.7/3.7	D	6

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow Power, (R)CA

Facility: Braidwood

Date of Examination: 7/12-7/16/04

Exam Level (circle one): RO / SRO(I) **SRO(U)**

Operating Test Number: 2004301

Control Room Systems (8 for RO, 7 for SRO-I, 2 or 3 for SRO-U)

System / JPM Title	Type Code*	Safety Function
a. N/A	N/A	N/A
b. N/A	N/A	N/A
c. N/A	N/A	N/A
d. TG / Respond to Main Generator Field Forcing SIM-S409 K/A 045A4.02 2.7/2.6	N, A, S	4S
e. CS / Start C/S pump using Attachment B SIM-505 K/A 026A3.01 4.3/4.5	N, A, S, L	5
f. EDG / Synchronize a SAT to a bus being fed by a Diesel SIM-601 K/A 064A4.09 3.2/3.3	D, S	6
g. N/A	N/A	N/A
h. N/A	N/A	N/A

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

i. ESFAS / ESFAS Slave Relay surveillance (K611) IP-202 K/A 013A3.01 3.7/3.9	D	2
j. SWS / Align FP to 2A CV pump (Abnormal) (PRA) IP-S407 K/A APE062AK3.03 4.0/4.2	D, R	4S
k. N/A	N/A	N/A

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow Power, (R)CA

OPERATING TEST NO.: 2004301

Applicant Type	Evolution Type	Minimum Number	Scenario Number			
			1		2	
			RO	BOP	RO	BOP
RO	Reactivity	1*	N/A	N/A	N/A	N/A
	Normal	1*	N/A	N/A	N/A	N/A
	Instrument/Component	4*	N/A	N/A	N/A	N/A
	Major	1	N/A	N/A	N/A	N/A

As RO	Reactivity	1*	1	**	1**	**
	Normal	0*	0	**	0**	**
	Instrument/Component	2*	2, 4, 6, 8	**	3, 4, 5**	**
	Major	1*	5, 7	**	7, 8**	**

SRO-I

As SRO	Reactivity	0	1	**	1	**
	Normal	1*	0	**	0	**
	Instrument/Component	2*	2, 3, 4, 6, 8	**	2-6	**
	Major	1*	5, 7	**	7, 8	**

SRO-U	Reactivity	0	1	N/A	N/A	N/A
	Normal	1*	0	N/A	N/A	N/A
	Instrument/Component	2*	2, 3, 4, 6, 8	N/A	N/A	N/A
	Major	1	5, 7	N/A	N/A	N/A

- Instructions:
- (1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.
 - (2) Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.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 one-for-one basis.
 - (3) Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirement.

Note: ** Marked cells denote scenarios where a surrogate may be present.

Author:

Robert M. [Signature]

NRC Reviewer:

Andrew R. McNeil

Facility Name: BRAIDWOOD		Date of Exam: 7/12-7/16/2004																	
Tier	Group	RO K/A Category Points											Total	SRO-Only Points					
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *		K	A	A 2	G *	Total	
1. Emergency & Abnormal Plant Evolutions	1	3	3	3				3	3				3	18	0	1	3	3	7
	2	1	1	1				2	2				2	9	1	0	2	2	5
	Tier Totals	4	4	4				5	5				5	27	1	1	5	5	12
2. Plant Systems	1	2	3	3	2	2	3	3	3	2	2	3	28	1	1	1	1	4	
	2	1	1	1	1	1	1	1	0	1	1	1	10	0	0	1	1	2	
	Tier Totals	3	4	4	3	3	4	4	3	3	3	4	38	1	1	2	2	6	
3. Generic Knowledge and Abilities Categories				1	2	3	4	10				1	2	3	4	7			
				2	3	2	3					2	2						

Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier of the RO outline (i.e., the "Tier Totals" in each K/A category shall not be less than two). Refer to Section D.1.c for additional guidance regarding SRO sampling.

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. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system or evolution unless they relate to plant-specific priorities.

4. Systems/evolutions within each group are identified on the associated outline.

5. The shaded areas are not applicable to the category/tier.

6.* 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. The SRO K/As must also be linked to 10 CFR 55.43 or an SRO-level learning objective.

7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) for the applicable license level, and the point totals for each system and category. Enter the group and tier totals for each category in the table above; summarize all the SRO-only knowledge and non-A2 ability categories in the columns labeled "K" and "A." Use duplicate pages for RO and SRO-only exams.

8. For Tier 3, enter the K/A numbers, descriptions, importance ratings, and point totals on Form ES-401-3.

9. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000007 Reactor Trip - Stabilization - Recovery / 1						04. 49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4	1
000008 Pressurizer Vapor Space Accident / 3									0
000009 Small Break LOCA / 3					0 7		CCWS surge tank vent isolation valve indication	2.7	1
000011 Large Break LOCA / 3			0 5				Injection into cold leg	4	1
000015 RCP Malfunctions / 4					0 8		When to secure RCPs on high bearing temperature	3.4	1
000017 RCP Malfunctions (Loss of RC Flow) / 4									
000022 Loss of Rx Coolant Makeup / 2	0 4						Reason for changing from manual to automatic control of charging flow valve controller	2.9	1
000025 Loss of RHR System / 4		0 3					Service water or closed cooling water pumps	2.7	1
000026 Loss of Component Cooling Water / 8						02. 22	Knowledge of limiting conditions for operations and safety limits.	3.4	1
000027 Pressurizer Pressure Control System Malfunction / 3				0 2			SCR-controlled heaters in manual mode	3.1	1
000029 ATWS / 1		0 6					Breakers, relays, and disconnects	2.9	1
000038 Steam Gen. Tube Rupture / 3	0 3						Natural circulation	3.9	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4									1
WE12 Uncontrolled Depressurization of all Steam Generators / 4				0 2			Operating behavior characteristics of the facility	3.6	
000054 (CE/E06) Loss of Main Feedwater / 4			0 5				HPI/PORV cycling upon total feedwater loss	4.6	1
000055 Station Blackout / 6			0 2				Actions contained in EOP for loss of offsite and onsite power	4.3	1
000056 Loss of Off-site Power / 6									0
000057 Loss of Vital AC Inst. Bus / 6									0
000058 Loss of DC Power / 6	0 1						Battery charger equipment and instrumentation	2.8	1
000062 Loss of Nuclear Svc Water / 4				0 2			Loads on the SWS in the control room	3.2	1
000065 Loss of Instrument Air / 8					0 8		Failure modes of air-operated equipment	2.9	1
W/E04 LOCA Outside Containment / 3		0 1					Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.5	1
W/E11 Loss of Emergency Coolant Recirc. / 4						04. 50	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	3.3	1
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4									0
K/A Category Totals:	3	3	3	3	3	3	Group Point Total:		18

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000001 Continuous Rod Withdrawal / 1									0
000003 Dropped Control Rod / 1									0
000005 Inoperable/Stuck Control Rod / 1									0
000024 Emergency Boration / 1						02	When use of manual boration valve is needed	3.9	1
000028 Pressurizer Level Malfunction / 2									0
000032 Loss of Source Range NI / 7									0
000033 Loss of Intermediate Range NI / 7						01. 23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.	3.9	1
000036 Fuel Handling Accident / 8									0
000037 Steam Generator Tube Leak / 3									0
000051 Loss of Condenser Vacuum / 4									0
000059 Accidental Liquid RadWaste Rel. / 9				03			Flow rate controller	3	1
000060 Accidental Gaseous Radwaste Rel. / 9									0
000061 ARM System Alarms / 7			02				Guidance contained in alarm response for ARM system	3.4	1
000067 Plant Fire On-site / 9 8				03			Bypass of a fire zone detector	2.5	1
000068 Control Room Evac. / 8									0
000069 Loss of CTMT Integrity / 5									0
W/E14 High Containment Pressure / 5									0
000074 Inad. Core Cooling / 4									0
W/E06 Degraded Core Cooling / 4									
W/E07 Saturated Core Cooling / 4									
000076 High Reactor Coolant Activity / 9									0
W/E01 Rediagnosis / 3		02					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	3.5	1
W/E02 SI Termination / 3									
W/E13 Steam Generator Over-pressure / 4					02		Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3	1
W/E15 Containment Flooding / 5									0
W/E16 High Containment Radiation / 9									0
W/E03 LOCA Cooldown - Depress. / 4	03						Annunciators and conditions indicating signals, and remedial actions associated with the LOCA Cooldown and Depressurization	3.5	1
W/E09 Natural Circulation Operations / 4						01. 27	Knowledge of system purpose and or function.	2.8	1
W/E10 Natural Circulation with Steam Voide in Vessel with/without RVLIS. / 4									
W/E08 RCS Overcooling - PTS / 4									0
K/A Category Totals:	1	1	1	2	2	2	Group Point Total:		9

E/APE # / Name / Safety Function	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
003 Reactor Coolant Pump			0 4									RPS	3.9	1
004 Chemical and Volume Control				0 4								Manual/automatic transfers of control	3.2	1
005 Residual Heat Removal							0 3					Closed cooling water flow rate and temperature	2.5	1
006 Emergency Core Cooling						0 3						Safety Injection Pumps	3.6	1
007 Pressurizer Relief/Quench Tank	0 3									0 1		RCS; PRT spray supply valve	3; 2.7	2
008 Component Cooling Water							0 3					CCW pressure	2.7	1
010 Pressurizer Pressure Control				0 1	0 2							Spray valve warm-up; Constant enthalpy expansion through a valve	2.7; 2.6	2
012 Reactor Protection					0 1						01, 33	DNB; Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	3.3; 3.4	2
013 Engineered Safety Features Actuation											0 2	Reset of ESFAS channels	4.3	1
022 Containment Cooling			0 2									Containment instrumentation readings	3	1
025 Ice Condenser														0
026 Containment Spray								0 2				Failure of automatic recirculation transfer	4.2	1
039 Main and Reheat Steam			0 6									SDS	2.8	1
056 Condensate								0 4				Loss of condensate pumps	2.6	1
059 Main Feedwater											04, 06	Knowledge symptom based EOP mitigation strategies.	3.1	1
061 Auxiliary/Emergency Feedwater						0 1					01, 02	Controllers and positioners; Knowledge of operator responsibilities during all modes of plant operation.	2.5; 3	2
062 AC Electrical Distribution		0 1										Major system loads	3.3	1
063 DC Electrical Distribution									0 1			Meters, annunciators, dials, recorders, and indicating lights	2.7	1
064 Emergency Diesel Generator						0 8			0 2			Fuel oil storage tanks; Minimum time for load pickup	3.2; 3.4	2
073 Process Radiation Monitoring									0 2			Detector failure	2.7	1
076 Service Water		0 1										Service water	2.7	1
078 Instrument Air		0 1										Instrument air compressor	2.7	1
103 Containment	0 5						0 1					Personnel access hatch and emergency access hatch; Containment pressure, temperature, and humidity	2.8; 3.7	2
K/A Category Totals:	2	3	3	2	2	3	3	3	2	2	3	Group Point Total:		28

Plant Systems - Tier 2/Group 2 (RO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
001 Control Rod Drive														0
002 Reactor Coolant				0 2								Monitoring reactor vessel level	3.5	1
011 Pressurizer Level Control														0
014 Rod Position Indication														0
015 Nuclear Instrumentation					1 3							Peaking and hot-channel factor	3.1	1
016 Non-nuclear Instrumentation														0
017 In-core Temperature Monitor							0 1					Core exit temperature	3.7	1
027 Containment Iodine Removal	0 1											CSS	3.4	1
028 Hydrogen Recombiner and Purge Control											01. 28	Knowledge of the purpose and function of major system components and controls.	3.2	1
029 Containment Purge										0 1		Containment purge flow rate	2.5	1
033 Spent Fuel Pool Cooling														0
034 Fuel Handling Equipment						0 2						Radiation monitoring systems	2.6	1
035 Steam Generator			0 2									ECCS	4	1
041 Steam Dump/Turbine Bypass Control														0
045 Main Turbine Generator									1 1			Generator trip	2.6	1
055 Condenser Air Removal														0
068 Liquid Radwaste														0
071 Waste Gas Disposal														0
072 Area Radiation Monitoring														0
075 Circulating Water		0 3										Emergency/essential SWS pumps	2.6	1
079 Station Air														0
086 Fire Protection														0
K/A Category Totals:	1	1	1	1	1	1	1	0	1	1	1	Group Point Total:		10

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000007 Reactor Trip - Stabilization - Recovery / 1									0
000008 Pressurizer Vapor Space Accident / 3					0 3		PORV position indicators and acoustic monitors	3.9	1
000009 Small Break LOCA / 3									0
000011 Large Break LOCA / 3									0
000015 RCP Malfunctions / 4									0
000017 RCP Malfunctions (Loss of RC Flow) / 4									0
000022 Loss of Rx Coolant Makeup / 2									0
000025 Loss of RHR System / 4				0 8			RHR cooler inlet and outlet temperature indicators	2.9	1
000026 Loss of Component Cooling Water / 8					0 3		The valve lineups necessary to restart the CCWS while bypassing the portion of the system causing the abnormal condition	2.9	1
000027 Pressurizer Pressure Control System Malfunction / 3									0
000029 ATWS / 1						01. 14	Knowledge of system status criteria which require the notification of plant personnel.	3.3	1
000038 Steam Gen. Tube Rupture / 3									0
000040 Steam Line Rupture - Excessive Heat Transfer / 4									0
WE12 Uncontrolled Depressurization of all Steam Generators / 4									0
000054 (CE/E06) Loss of Main Feedwater / 4									0
000055 Station Blackout / 6									0
000056 Loss of Off-site Power / 6						01. 14	Knowledge of system status criteria which require the notification of plant personnel.	3.3	1
000057 Loss of Vital AC Inst. Bus / 6						01. 30	Ability to locate and operate components, including local controls.	3.4	1
000058 Loss of DC Power / 6									0
000062 Loss of Nuclear Svc Water / 4									0
000065 Loss of Instrument Air / 8									0
WE/E04 LOCA Outside Containment / 3									0
WE/E11 Loss of Emergency Coolant Recirc. / 4									0
BW/E04; WE/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4					0 1		Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.4	1
K/A Category Totals:	0	0	0	1	3	3	Group Point Total:		7

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000001 Continuous Rod Withdrawal / 1						01. 32	Ability to explain and apply all system limits and precautions.	3.8	1
000003 Dropped Control Rod / 1									0
000005 Inoperable/Stuck Control Rod / 1									0
000024 Emergency Boration / 1									0
000028 Pressurizer Level Malfunction / 2									0
000032 Loss of Source Range NI / 7						01	Normal/abnormal power supply operation	2.9	1
000033 Loss of Intermediate Range NI / 7									0
000036 Fuel Handling Accident / 8	01						Radiation exposure hazards	4.1	1
000037 Steam Generator Tube Leak / 3									0
000051 Loss of Condenser Vacuum / 4									0
000059 Accidental Liquid RadWaste Rel. / 9									0
000060 Accidental Gaseous Radwaste Rel. / 9									0
000061 ARM System Alarms / 7									0
000067 Plant Fire On-site / 9 8									0
000068 Control Room Evac. / 8						04. 31	Knowledge of annunciators alarms and indications, and use of the response instructions.	3.4	1
000069 Loss of CTMT Integrity / 5									0
W/E14 High Containment Pressure / 5									
000074 Inad. Core Cooling / 4									
W/E06 Degraded Core Cooling / 4						01	Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.2	1
W/E07 Saturated Core Cooling / 4									
000076 High Reactor Coolant Activity / 9									0
W/E01 Rediagnosis / 3									0
W/E02 SI Termination / 3									
W/E13 Steam Generator Over-pressure / 4									0
W/E15 Containment Flooding / 5									0
W/E16 High Containment Radiation / 9									0
W/E03 LOCA Cooldown - Depress. / 4									0
W/E09 Natural Circulation Operations / 4									0
W/E10 Natural Circulation with Steam Voide in Vessel with/without RVLIS. / 4									0
W/E08 RCS Overcooling - PTS / 4									0
K/A Category Totals:	1	0	0	0	2	2	Group Point Total:		5

E/APE # / Name / Safety Function	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
003 Reactor Coolant Pump														0
004 Chemical and Volume Control														0
005 Residual Heat Removal			0 5									ECCS	3.8	1
006 Emergency Core Cooling								0 2				Loss of flow path	4.3	1
007 Pressurizer Relief/Quench Tank														0
008 Component Cooling Water														0
010 Pressurizer Pressure Control														0
012 Reactor Protection														0
013 Engineered Safety Features Actuation														0
022 Containment Cooling														0
025 Ice Condenser														0
026 Containment Spray														0
039 Main and Reheat Steam														0
056 Condensate														0
059 Main Feedwater														0
061 Auxiliary/Emergency Feedwater														0
062 AC Electrical Distribution									0 5			Safety-related indicators and controls	3.6	1
063 DC Electrical Distribution														0
064 Emergency Diesel Generator														0
073 Process Radiation Monitoring											01. 28	Knowledge of the purpose and function of major system components and controls.	3.3	1
076 Service Water														0
078 Instrument Air														0
103 Containment														0
K/A Category Totals:	0	0	1	0	0	0	0	1	1	0	1	Group Point Total:		4

Plant Systems - Tier 2/Group 2 (SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
001 Control Rod Drive								0	2			Loss of power source to reactor trip breakers	4.3	1
002 Reactor Coolant														0
011 Pressurizer Level Control														0
014 Rod Position Indication														0
015 Nuclear Instrumentation														0
016 Non-nuclear Instrumentation														0
017 In-core Temperature Monitor														0
027 Containment Iodine Removal														0
028 Hydrogen Recombiner and Purge Control														0
029 Containment Purge														0
033 Spent Fuel Pool Cooling														0
034 Fuel Handling Equipment														0
035 Steam Generator														0
041 Steam Dump/Turbine Bypass Control											04.50	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	3.3	1
045 Main Turbine Generator														0
055 Condenser Air Removal														0
068 Liquid Radwaste														0
071 Waste Gas Disposal														0
072 Area Radiation Monitoring														0
075 Circulating Water														0
079 Station Air														0
086 Fire Protection														0
K/A Category Totals:	0	0	0	0	0	0	0	1	0	0	1	Group Point Total:		2

Facility Name: BRAIDWOOD Date of Exam: 7/12-7/16/2004

Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1. 25	Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data.	2.8	1		
	2.1. 33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	3.4	1		
	2.1. 12	Ability to apply technical specifications for a system.			4	1
	2.1. 01	Knowledge of conduct of operations requirements.			3.8	1
	2.1.					
	2.1.					
	Subtotal				2	
2. Equipment Control	2.2. 02	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	4	1		
	2.2. 31	Knowledge of procedures and limitations involved in initial core loading.			2.9	1
	2.2. 11	Knowledge of the process for controlling temporary changes.	2.5	1		
	2.2. 16	Knowledge of the process for making of field changes.			2.6	1
	2.2. 13	Knowledge of tagging and clearance procedures.	3.6	1		
	2.2.					
	Subtotal				3	
3. Radiation Control	2.3. 07	Knowledge of the process for preparing a radiation work permit.			3.3	1
	2.3. 04	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1		
	2.3. 09	Knowledge of the process for performing a containment purge.	2.5	1		
	2.3.					
	2.3.					
	2.3.					
	Subtotal				2	
4. Emergency Procedures / Plan	2.4. 50	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	3.3	1		
	2.4. 33	Knowledge of the process used track inoperable alarms.			2.8	1
	2.4. 47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	3.4	1		
	2.4. 18	Knowledge of the specific bases for EOPs.	2.7	1		
	2.4. 13	Knowledge of crew roles and responsibilities during EOP flowchart use.			3.9	1
	2.4.					
	Subtotal				3	
Tier 3 Point Total				10		7

Simulation Facility Braidwood Scenario No.: Operating Test No.:
NRC 04-1 **2004301**
 Examiners: _____ Applicant: _____ SRO
 _____ RO
 _____ Surrogate BOP

LOSS OF HEAT SINK

Initial Conditions: IC-21

Turnover: 100% power, BOL, equilibrium Xenon, steady state. PRT Gas sampling in progress. 1B CV pump is running. 0 CC pump is aligned to Bus 142. Unit 2 SAC is tagged out due to high vibration problems, Diesel Backup air compressor will be on site tomorrow. 1B AF pump was tagged out for turbocharger replacement (TS 3.7.5 condition A was entered 70 hours ago), a test run has just failed. Unit 1 shutdown has been ordered by the OCC. On line risk status is YELLOW.

Event No.	Malf. No.	Event Type*	Event Description
Preload	IMF FW43 IMF RP01 IRF RP52 OUT IOR ZDI11A065 OPEN IOR ZDI11A066 OPEN IOR ZDI1RY8026 OPEN IOR ZDI1AF01PB PTL IOR ZLO1AF01PBC OFF IOR ZDI2SA01C PTL		1A AF pp Fail to start Failure of automatic Reactor Trip K606 Failure Cont Isolation Valves 1RY8026 failed open 1B AF pp OOS Unit 2 SAC OOS
1	NONE	R(RO, US) N(BOP)	Power Change
2	IMF RX21A 1700	I(RO, US)	PZR press channel IPT455 fails low
3	IOR ZDI0WO01PB PTL	C(BOP, US)	0B VC Chill Water pump trip
4	IMF CV23A 30	C(ALL)	30 GPM 1A Letdown HX leak
5, 6, & 7	IMF ED05A Preload Preload, IMF MS07B 4	M (ALL) C (RO, US) C/M (ALL)	6.9KV bus 156 Faults Rx does not auto trip, manual Rx Trip will work. 1A AF pump fails to start. Loss of Heat Sink, 1B MS Line Faults inside containment 30 seconds after pump trip.
Remote Remote Remote	IRF FW150 REMOVED IRF FW151 REMOVED IRF FW149 START		Remove fuses Defeat FW isolation A Train Remove fuses Defeat FW isolation B Train Starts S/U Feedwater pump Aux Oil Pump
8	Preload, CAEPs NRC 04-2 EVENT 7 and 7A	C(ALL)	K606 fails to operate Cont Isolation valves fail to auto close, 1RY8026 cannot be closed from the control room

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

Simulation Facility Braidwood

Scenario No.: Operating Test No.:

NRC 04-2 2004301

Examiners: _____

Applicant: _____ SRO

RO

Surrogate

BOP

ATWS/ Tube Rupture

Initial Conditions: IC-20

Turnover: 50% Steady state EOL, 1B FW pp turbine rebuilding in progress, 1A SI pump tagged (TS 3.5.2 cond A was entered 24 hours ago) to replace oil cooler, expected back tomorrow. RCS activity is elevated (below TS limits for continuous operation). National security threat level has just been raised to Orange due to a non-specific threat against a United States nuclear plant. System Power has requested an 80 Mw reduction in Unit 1 Load as soon as possible. Chemistry has requested the Unit 1 Cation bed be placed in-service for 25 minutes. A NLO is being briefed by the WEC on placing the Cation bed in service and will contact the U1 control room when ready. On line risk status is YELLOW.

Event No.	Malf. No.	Event Type*	Event Description
Preload	IMF RP02A IMF RP02B IOR ZDI1SI01P PTL IRF MS69 0 IRF MS71 0 IRF FW025 0 IOR ZDI1FW002B CLS IOR ZDI1FW002B CLS IOR ZDI1FW01PBA PTL IOR ZDI1FW01PBB PTL IOR ZDI1FW01PPC PTL IOR ZLO1ES095A2 OFF IOR ZLO1ES095A1 ON IOR ZDI1FW01PBE STOP		RTA fails to operate RTB fails to operate 1A SI pump OOS 1B FW pp OOS
1	NONE	R(RO, US) N(BOP)	Power Change
2	IMF RM02B	I(US)	1PR011J (Cont Atmos Rad Monitor) Fails
3	IMF RX10A 0	I(ALL)	1PT505 failure
4	IMF RX13A 100	I(RO, US)	1LT459 fails High
5, 6, 7	IMF RD09 0 IOR ZDI1MS001D CLS Preload	I(RO, US) C(BOP, US) M(ALL)	Rod speed fails to zero 1D MSIV fails closed ATWS
8	IMF TH03A 300	M(ALL)	Tube Rupture 1A S/G

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