

FINAL SUBMITTAL

**H. B. ROBINSON NUCLEAR PLANT
EXAM NO. 50-261/2000-301**

MAY 3, 2000

FINAL OUTLINE

REVISION 1

This is revision 1 to what was sent to the NRC. The only change is to FORM ES-401-5, Generic Knowledge and Abilities Outline (Tier 3). Under Emergency Procedures/Plan, revision 0 did not have a "3" in the Total box. The 3 was added in revision 1. This correction was communicated by Rick Baldwin on 2-28-00.

Facility: H. B. Robinson Unit 2			Date of Exam: May 2, 2000			Exam Level: RO							
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	2	2	3				3	3			3	16
	2	3	2	3				3	3			3	17
	3			1				1	1				3
	Tier Totals	5	4	7				7	7			6	36
2. Plant Systems	1	3	1	3	2	2	2	2	2	2	2	2	23
	2	1	1	2	2	2	2	2	2	2	2	2	20
	3			1	1	1	1	1	1	1	1		8
	Tier Totals	4	2	6	5	5	5	5	5	5	5	4	51
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		13
					4		4		2		3		
<p>Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p>2. Actual point totals must match those specified in the table.</p> <p>3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>6.* The generic 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.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p>													

ES-401		PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1						Form ES-401-4	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1			x				AK3.05: Reasons for Power limits on rod misalign as applied to inop/stuck rod	3.4	1
000015/17 RCP Malfunctions / 4						x	GEN 2.1.7: Eval plant performance, make operational judgments based on operating characteristics, Rx behavior, and instrument interpretation	3.7	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4				x			E09-EA1.1: Op and/or monitor components & functions of control/safety systems (instrumentation, signals, intlks, failure modes, auto/manual features)	3.5	1
000024 Emergency Boration / 1	x						AK1.02: Op impl of relation btwn boron add & Rx pwr as appl to emer boration	3.6	1
000026 Loss of Component Cooling Water / 8					x		AA2.04: Determine and interpret normal values and upper limits for temps of components cooled by CCW as they apply to loss of CCW	2.5	1
000027 Pressurizer Pressure Control System Malfunction / 3		x					AK2.03: Interrelations between PZR press control malfs and controllers & positioners	2.6	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4						x	GEN 2.2.1: Perform pre-startup procedures including operating controls of equipment that could affect reactivity	3.7	1
CE/A11; W/E08 RCS Overcooling - PTS / 4			x				EK3.3: Reasons manipulation of controls to obtain desired results during abnormal/emerg situations as related to PTS	3.7	1
000051 Loss of Condenser Vacuum / 4									
000055 Station Blackout / 6	x			x			EK1.02: Operational implications of natural circ cooling during station blackout EA1.02: Operate/monitor manual EDG start during station blackout	4.1 4.3	2
000057 Loss of Vital AC Elec. Inst. Bus / 6		x					AK2.03: Interrelations between loss of inst. bus & controllers/positioners	2.2*	1
000062 Loss of Nuclear Service Water / 4					x		AA2.02: Determine/interpret cause of possible SWS loss	2.9	1
000067 Plant Fire On-site / 9			x				AK3.04: Reasons for actions contained in EOP for plant fire on site	3.3	1
000068 (BW/A06) Control Room Evac. / 8						x	GEN 2.3.4:Rad exp. Limits & contamination control including permissible levels > authorized	2.5	1
000069 (W/E14) Loss of CTMT Integrity / 5				x			AA1.03: Operate/monitor fluid sys. Penetrating CV as they apply to loss of CV integrity	2.8	1
000074 (W/E06&E07) Inad. Core Cooling / 4									
BW/E03 Inadequate Subcooling Margin / 4							N/A		
000076 High Reactor Coolant Activity / 9					x		AA2.02: Determine/interpret corrective acts required for Hi FP activity in RCS	2.8	1
BW/A02&A03 Loss of NNI-X/Y / 7							N/A		
K/A Category Totals:	2	2	3	3	3	3	Group Point Total:		16

ES-401		PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2						Form ES-401-4	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1			x				AK3.01: Reasons for manually driving rods into position that existed before start of casualty as applied to continuous rod withdrawal	3.2	1
000003 Dropped Control Rod / 1			x				AK3.05: Reasons for T.S. limits for load reduction to 50% power if flux can't be brought back w/i target band as applied to dropped rod	3.4*	1
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1				x			EA1.04: Operate/monitor RCP operation & flow rates as applied to Rx trip	3.6	1
BW/A01 Plant Runback / 1							N/A		
BW/A04 Turbine Trip / 4							N/A		
000008 Pressurizer Vapor Space Accident / 3				x			AA1.01: Operate/monitor PZR spray block valve & PORV block valve	4.2	1
000009 Small Break LOCA / 3					x		EA2.02: Determine/interpret possible leak paths as applied to SB LOCA	3.5	1
000011 Large Break LOCA / 3					x		EA2.08: Determine/interpret conditions necessary for recovery when accident reaches stable phase as applied to LB LOCA	3.4*	1
W/E04 LOCA Outside Containment / 3						x	GEN 2.4.4: Recognize abnormal indications which are AOP/EOP entry-level conditions	4.0	1
BW/E08; W/E03 LOCA Cutdown/Depress. / 4						x	GEN 2.1.19: Use plant computer to obtain/evaluate parametric info on sys/component status	3.0	1
W/E11 Loss of Emergency Coolant Recirc. / 4	x						EK1.3: Annunciators/conditions indicating signals & remedial actions	3.6	1
W/E01 & E02 Rediagnosis & SI Termination / 3	x						E02-EK1.1: Components, capacity & function of emergency systems	3.2	1
000022 Loss of Reactor Coolant Makeup / 2		x					AK2.01: Interrelations between loss of RCP makeup & valves	2.4	1
000025 Loss of RHR System / 4									
000029 Anticipated Transient w/o Scram / 1			x				EK3.11: Reasons for initiating emergency boration as applied to ATWS	4.2	1
000032 Loss of Source Range NI / 7									
000033 Loss of Intermediate Range NI / 7				x			AA1.02: Operate/monitor level trip bypass as applied to loss of IR NIS	3.0	1
000037 Steam Generator Tube Leak / 3									
000038 Steam Generator Tube Rupture / 3					x		EA2.03: Ability to determine which S/G is ruptured	4.4	1
000054 (CE/E06) Loss of Main Feedwater / 4									
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4						x	GEN 2.2.22: Knowledge of LCOs & safety limits	3.4	1
000058 Loss of DC Power / 6									
000059 Accidental Liquid RadWaste Rel. / 9	x						AK1.02: Op implications of bio effects of various types of rad acceptable exp. levels, units for rad intensity measurements & exposure levels	2.6	1
000060 Accidental Gaseous Radwaste Rel. / 9									
000061 ARM System Alarms / 7									
W/E16 High Containment Radiation / 9		x					EK2.1: Interrelations btwn hi CV rad and components & functions of control/safety sys (inst. signals, intiks, failures, auto & manual features)	3.0	1
CE/E09 Functional Recovery							N/A		
K/A Category Point Totals:	3	2	3	3	3	3	Group Point Total:		17

ES-401		PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 3						Form ES-401-4	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2			x				AK3.03: Reasons for false indication of PZR level when PORV or Spray Valve is open & RCS saturated as applied to PZR level control malf	3.5	1
000036 (BW/A08) Fuel Handling Accident / 8									
000056 Loss of Off-site Power / 6				x			AA1.32: Operate/monitor PZR PORV hand switch as applied to LOOP	3.4*	1
000065 Loss of Instrument Air / 8									
BW/E13&E14 EOP Rules and Enclosures							N/A		
BW/A05 Emergency Diesel Actuation / 6							N/A		
BW/A07 Flooding / 8							N/A		
CE/A16 Excess RCS Leakage / 2							N/A		
W/E13 Steam Generator Over-pressure / 4					x		EA2.02: Determine/interpret adherence to appropriate procedures, operation w/i limitations of facility's license as applied to S/G overpress	3.0	1
W/E15 Containment Flooding / 5									
K/A Category Point Totals:			1	1	1		Group Point Total:		3

ES-401		PWR RO Examination Outline Plant Systems - Tier 2/Group 1										Form ES-401-4		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive			x		x							K3.01: Effect of a loss/malf of CRDS on CVCS K5.72: Op implications of reactivity balance (shutdown withdrawal precedes dilution)	2.9* 3.1	2
003 Reactor Coolant Pump	x									x		K1.02: Phy connections-cause/effect relationship between RCPs & RCP motor cooling & vent A4.04: Manually op/monitor RCP seal diff pressure inst	2.6 3.1	2
004 Chemical and Volume Control				x		x						K4.10: CVCS design feature(s)/intlk(s) which provide min. temp req'ts on borated sys K6.10: Effect of loss/malf of BAST recirc flow path	3.2 2.7	2
013 Engineered Safety Features Actuation		x									x	K2.01: Bus power supply to ESFAS/safeguards equip. control GEN 2.3.9: Process for performing a CV purge	3.6* 2.5	2
015 Nuclear Instrumentation					x		x					K5.04: Factors affecting accuracy/reliability of calorimetric calibrations A1.05: predict/monitor changes to prevent exceeding design limits assoc w/ NIS controls including imbalance (axial shape)	2.6 3.7	2
017 In-core Temperature Monitor	x		x									K1.02: Physical connections-cause/effect relationship between ITM & RCS K3.01: Effect that a loss/malf of the ITM will have on nat circ indications	3.3 3.5*	2
022 Containment Cooling						x		x				K6.02: Effect of a loss/malf of sensors/detectors A2.05: Predict impact of major leak in CV cooling system and use procedures to correct/control/mitigate consequences	2.1 3.1	2
025 Ice Condenser												N/A		
056 Condensate	x											K1.03: Physical connections-cause/effect relationship between condensate & MFW	2.6*	1
059 Main Feedwater							x		x			A1.03: Predict/monitor changes in parameters assoc w/ op MFW controls including power level restrictions for op. of MFW pumps/valves A3.06: Monitor auto op. of FW Isol	2.7* 3.2*	2
061 Auxiliary/Emergency Feedwater			x									K3.02: Loss/malf of AFW will have on S/G	4.2	1
068 Liquid Radwaste								x		x		A2.02: lack of tank recirc prior to release A4.04: Manually op/monitor auto isolation in CR	2.7* 3.8	2
071 Waste Gas Disposal				x								K4.04: Design feature(s)/intlk(s) which provide for isolation of WGDTS	2.9	1
072 Area Radiation Monitoring									x		x	A3.01: Monitor auto op. of ARM sys. Including changes in ventilation align GEN 2.4.39: RO's responsibilities in emer. Plan implementation	2.9* 3.3	2
K/A Category Point Totals:	3	1	3	2	2	2	2	2	2	2	2	Group Point Total:		23

ES-401		PWR RO Examination Outline Plant Systems - Tier 2/Group 2										Form ES-401-4		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant			x									K3.03:Effect that a loss/malf of the RCS will have on CV	4.2	1
006 Emergency Core Cooling		x										K2.02:Bus Power supply for valve operators of SI accums	2.5*	1
010 Pressurizer Pressure Control			x	x								K3.03:Effect that a loss/malf of the PZR PCS will have on ESFAS K4.02:PZR PCS design feature(s)/intlk(s) which provide for prevention of uncovering PZR Htrs	4.0 3.0	2
011 Pressurizer Level Control						x						K6.05:Effect of loss/malf of function of PZR level gauges as post accident monitors will have on PZR LCS	3.1	1
012 Reactor Protection				x	x							K4.05:Design feature(s)/intlk(s) which provide for spurious trip protection K5.01:Operational implications of DNB as applies to RPS	2.7 3.3*	2
014 Rod Position Indication														
016 Non-nuclear Instrumentation					x							K5.01:Op implication of separation of control & protection	2.7*	1
026 Containment Spray														
029 Containment Purge							x					A1.03:Predict/monitor changes in CV press, temp, & humidity to prevent exceeding design limits	3.0*	1
033 Spent Fuel Pool Cooling											x	GEN 2.2.28:Knowledge of new & spent fuel movement procedures	2.6	1
035 Steam Generator							x	x				A1.01:Predict/monitor changes in S/G WR/NR level during S/U, S/D & normal ops. A2.02: Predict impact of Rx trip/turb trip on S/G, use proc to correct/control/mitigate	3.6 4.2	2
039 Main and Reheat Steam								x				A2.03: Indications/alarms for MS & ARMs (during SGTR)	3.4	1
055 Condenser Air Removal														
062 AC Electrical Distribution									x			A3.04:Monitor auto op. of inverter	2.7	1
063 DC Electrical Distribution									x	x		A3.01:Monitor auto op of DC elec Sys including meters, annun, dials, recorders & lights A4.02:Man op/monitor battery voltage indicator in the CR	2.7 2.8*	2
064 Emergency Diesel Generator						x						K6.07:Effect of loss/malf of air receivers on EDG system	2.7	1
073 Process Radiation Monitoring										x	x	A4.03: Manually operate/monitor check source for op. demonstration GEN 2.1.24: Obtain/interpret station elec & mech dwgs	3.1 2.8	2
075 Circulating Water														
079 Station Air	x											K1.01: Physical connections/cause-effect relationships between SAS & IAS	3.0	1
086 Fire Protection														
K/A Category Point Totals:	1	1	2	2	2	2	2	2	2	2	2	Group Point Total:		20

ES-401		PWR RO Examination Outline Plant Systems - Tier 2/Group 3										Form ES-401-4		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal			x									K3.05: Effect that a loss/malf of the RHRS will have on ECCS	3.7*	1
007 Pressurizer Relief/Quench Tank									x			A3.01: Monitor auto operation of the PRTS, including components which discharge to PRT	2.7*	1
008 Component Cooling Water				x						x		K4.01: CCWS design features and/or interlocks which provide auto start of standby pump A4.04: Manually operate/monitor in the CR startup of a CCW pump when system is shutdown	3.1 2.6*	2
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control					x							K5.03: Operational implications of sources of H2 in CV as it applies to HRPS	2.9	1
034 Fuel Handling Equipment														
041 Steam Dump/Turbine Bypass Control						x						K6.03: Effect of loss or malfunction on controller and positioners, including ICS, S/G, CRDS will have on SDS	2.7	1
045 Main Turbine Generator														
076 Service Water							x					A1.02: Predict or monitor changes in parameters associated with operating the SWS controls including reactor and turbine bldg closed cooling water temps	2.6*	1
078 Instrument Air														
103 Containment								x				A2.03: a) Predict the impacts of Phase A and B isolation on CV, and (b) based on those predictions, use procedures to correct/control/mitigate the consequences of Phase A and B isolation	3.5*	1
K/A Category Point Totals:			1	1	1	1	1	1	1	1		Group Point Total:		8
Plant-Specific Priorities														
						Recommended Replacement for...			Reason			Points		
Plant-Specific Priority Total: (limit 10)														0

Facility: H. B. Robinson Unit 2		Date of Exam: May 2, 2000		Exam Level: RO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.12	Ability to apply tech specs for a system	2.9	1	
	2.1.20	Ability to execute procedure steps	4.3	1	
	2.1.27	Knowledge of system purpose and/or function	2.8	1	
	2.1.32	Ability to explain and apply all system limits and precautions	3.4	1	
	2.1.				
	2.1.				
	Total			4	
Equipment Control	2.2.13	Knowledge of tagging and clearance procedures	3.6	1	
	2.2.22	Knowledge of limiting conditions for operations and safety limits	3.4	1	
	2.2.27	Knowledge of the refueling process	2.6	1	
	2.2.34	Knowledge of the process for determining the internal and external effects on core reactivity	2.8	1	
	2.2.				
	2.2.				
	Total			4	
Radiation Control	2.3.9	Knowledge of the process for performing a CV purge	2.5	1	
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized	2.5	1	
	2.3.				
	2.3.				
	2.3.				
	2.3.				
	Total			2	
Emergency Procedures/ Plan	2.4.17	Knowledge of EOP terms and definitions	3.1	1	
	2.4.24	Knowledge of loss of cooling water procedures	3.3	1	
	2.4.31	Knowledge of annunciator alarms and indications, and use of the response instructions	3.3	1	
	2.4.				
	2.4.				
	2.4.				
	Total			3	
Tier 3 Point Total (RO)				13	