

Facility: CPNPP 1 & 2		Date of Exam: 06/06/11																
Tier	Group	RO K/A Category Points											SRO-Only Points					
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total		
1. Emergency & Abnormal Plant Evolutions	1	2	3	3				3	4			3	18	4	2	6		
	2	2	1	2				1	2			1	9	2	2	4		
	Tier Totals	4	4	5				4	6			4	27	6	4	10		
2. Plant Systems	1	2	2	3	4	3	0	2	2	4	3	3	28	2	3	5		
	2	1	0	1	1	1	2	0	1	1	1	1	10	1	1	3		
	Tier Totals	3	2	4	5	4	2	2	3	5	4	4	38	4	4	8		
3. Generic Knowledge and Abilities Categories					1	2	3	4					10	1	2	3	4	7
					3	2	2	3						2	2	1	2	

Note:

- 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).
- 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.
- 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.
- 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.
- 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.
- Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
- * 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.
- 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.
- 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.

CPNPP 1 & 2
NRC Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
058 / Loss of DC Power / 6					X		AA2.03	Ability to determine and interpret the following as they apply to the Loss of DC Power: DC loads lost; impact on ability to operate and monitor plant systems	3.9	76
057 / Loss of Offsite Power / 6						X	2.2.40	Equipment Control: Ability to apply Technical Specifications for a system	4.7	77
007 / Reactor Trip - Stabilization - Recovery / 1					X		EA2.05	Ability to determine and interpret the following as they apply to a reactor trip: Reactor trip first-out indication	3.9	78
W/E11 / Loss of Emergency Coolant Recirculation / 4					X		EA2.2	Ability to determine and interpret the following as they apply to the Loss of Emergency Coolant Recirculation: Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments:	4.2	79
011 / Large Break LOCA / 3					X		EA2.01	Ability to determine and interpret the following as they apply to a Large Break LOCA: Actions to be taken, based on RCS temperature and pressure – saturated or superheated	4.7	80
W/E05 / Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4						X	2.1.32	Conduct of Operations: Ability to explain and apply system limits and precautions	4.0	81
008 / Pressurizer Vapor Space Accident / 3		X					AK2.02	Knowledge of the interrelations between the Pressurizer Vapor Space Accident and the following: Sensors and detectors	2.7	39
009 / Small Break LOCA / 3						X	2.1.27	Conduct of Operations: Knowledge of system purpose and/or function	3.9	40
015 / RCP Malfunctions / 4		X					AK2.10	Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following: RCP indicators and controls	2.8	41
022 / Loss of Reactor Coolant Makeup / 2					X		AA2.01	Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Makeup: Whether charging line leak exists	3.2	42
025 / Loss of RHR System / 4						X	2.4.9	Emergency Procedures/Plan: Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies	3.8	43

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E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
026 / Loss of Component Cooling Water / 8					X		AA2.02	Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: The cause of possible CCW loss	2.9	44
027 / Pressurizer Pressure Control Malfunction / 3				X			AA1.01	Ability to operate and/or monitor the following as they apply to the Pressurizer Pressure Control Malfunction: PZR heaters, sprays, and PORVs	4.0	45
029 / ATWS / 1		X					EK2.06	Knowledge of the interrelations between the following and an ATWS: Breakers, relays, and disconnects	2.9	46
038 / Steam Generator Tube Rupture / 3				X			EA1.01	Ability to operate and/or monitor the following as they apply to a Steam Generator Tube Rupture: SG levels, for abnormal increase in any SG	4.5	47
040 / Steam Line Rupture / 4	X						AK1.06	Knowledge of the operational implications of the following concepts as they apply to the Steam Line Rupture: High energy steam line break considerations	3.7	48
W/E12 / Uncontrolled Depressurization of All Steam Generators / 4			X				EK3.1	Knowledge of the reasons for the following responses as they apply to the Uncontrolled Depressurization of All Steam Generators: 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	3.5	49
054 / Loss of Main Feedwater / 4					X		AA2.02	Ability to determine and interpret the following as they apply to the Loss of Main Feedwater: Differentiation between loss of all MFW and trip of one MFW pump	4.1	50
055 / Station Blackout / 6			X				EK3.02	Knowledge of the reasons for the following responses as they apply to the Station Blackout: Actions contained in EOP for loss of offsite and onsite power	4.3	51
057 / Loss of Vital AC Instrument Bus / 6				X			AA1.03	Ability to operate and/or monitor the following as they apply to the Loss of Vital AC Instrument Bus: Feedwater pump speed to control pressure and level in SG	3.6	52

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 Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
062 / Loss of Nuclear Service Water / 4					X		AA2.04	Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: The normal values and upper limits for the temperatures of the components cooled by SWS	2.5	53
065 / Loss of Instrument Air / 8						X	2.4.4	Emergency Procedures / Plan: Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures	4.5	54
W/E04 / LOCA Outside Containment / 3	X						EK1.1	Knowledge of the operational implications of the following concepts as they apply to the LOCA Outside Containment: Components, capacity, and function of emergency systems	3.5	55
077 / Generator Voltage and Electric Grid Disturbances / 6			X				AK3.02	Knowledge of the reasons for the following responses as they apply to the Generator Voltage and Electric Grid Disturbances: Actions contained in the abnormal operating procedure for voltage and grid disturbances	3.6	56
K/A Category Point Totals:	2	3	3	3	4 / 4	3 / 2	Group Point Total:		18 / 6	

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NRC Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
W/E15 / Containment Flooding / 5					X		EA2.2	Ability to determine and interpret the following as they apply to the Containment Flooding: Adherence to appropriate procedures and operation within limitations in the facility's license and amendments	3.3	82
W/E16 / High Containment Radiation / 9						X	2.2.42	Equipment Control: Ability to recognize system parameters that are entry level conditions for Technical Specifications	4.6	83
W/E06 & E07 / Inadequate Core Cooling / 4						X	2.4.6	Emergency Procedures/Plan: Knowledge of EOP mitigation strategies	4.7	84
032 / Loss of Source Range NI / 7					X		AA2.07	Ability to determine and interpret the following as they apply to the Loss of Source Range Nuclear Instrumentation: Maximum allowable channel disagreement	3.4	85
051 / Loss of Condenser Vacuum / 4					X		AA2.02	Ability to determine and interpret the following as they apply to the Loss of Condenser Vacuum: Conditions requiring reactor and/or turbine trip	3.9	57
060 / Accidental Gaseous Radwaste Release / 9		X					AK2.02	Knowledge of the interrelations between Accidental Gaseous Radwaste Release and the following: Auxiliary building ventilation system	2.7	58
037 / Steam Generator Tube Leak / 3	X						AK1.02	Knowledge of the operational implications of the following concepts as they apply to the Steam Generator Tube Leak: Leakrate versus pressure drop	3.5	59
076 / High Reactor Coolant Activity / 9			X				AK3.05	Knowledge of the reasons for the following responses as they apply to the High Reactor Coolant Activity: Corrective actions as a result of high fission product radioactivity level in the RCS	2.9	60
W/E08 / RCS Overcooling - PTS / 4				X			EA1.3	Ability to operate and/or monitor the following as they apply to Pressurized Thermal Shock: Desired operating results during abnormal and emergency situations	3.6	61
W/E14 / Loss of Containment Integrity / 5					X		EA2.1	Ability to determine and interpret the following as they apply to the High Containment Pressure: Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.3	62

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 Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
W/E02 / SI Termination / 3			X				EK3.3	Knowledge of the reasons for the following responses as they apply to the SI Termination: Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations	3.9	63
061 / ARM System Alarms / 7						X	2.1.28	Conduct of Operations: Knowledge of the purpose and function of major system components and controls	4.1	64
059 / Accidental Liquid Radwaste Release / 9	X						AK1.02	Knowledge of the operational implications of the following concepts as they apply to the Accidental Liquid Radwaste Release: Biological effects on humans of various types of radiation, exposure levels that are acceptable for nuclear power plant personnel, and the units used for radiation intensity measurements and for radiation exposure levels	2.6	65
K/A Category Point Totals:	2	1	2	1	2 / 2	1 / 2	Group Point Total:		9 / 4	

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 NRC Written Examination Outline
 Plant Systems – Tier 2 Group 1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Q#
076 / Service Water											X	2.4.45	Emergency Procedures/Plan: Ability to prioritize and interpret the significance of each annunciator or alarm	4.3	86
006 / Emergency Core Cooling								X				A2.02	Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of flowpath	4.3	87
059 / Main Feedwater								X				A2.07	Ability to (a) predict the impacts of the following malfunctions or operations on the MFW System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Tripping of MFW pump turbine	3.3	88
003 / Reactor Coolant Pump											X	2.4.4	Emergency Procedures/Plan: Ability to recognize abnormal indications for system operating parameters that are entry level conditions for emergency and abnormal procedures	4.7	89
013 / Engineered Safety Features Actuation											X	2.1.30	Conduct of Operations: Ability to locate and operate components, including local controls	4.0	90
003 / Reactor Coolant Pump									X			A3.01	Ability to monitor automatic operation of the RCPs including: Seal injection flow	3.3	1
004 / Chemical and Volume Control	X											K1.05	Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the following systems: CRDS operation in automatic mode control	2.7	2
005 / Residual Heat Removal			X									K3.07	Knowledge of the effect that a loss or malfunction of the RHRs will have on the following: Refueling operations	3.2	3
006 / Emergency Core Cooling					X							K5.06	Knowledge of the operational implications of the following concepts as they apply to ECCS: Relationship between ECCS flow and RCS pressure	3.5	4
006 / Emergency Core Cooling				X								K4.01	Knowledge of ECCS design feature(s) and/or interlock(s) which provide for the following: Cooling of centrifugal pump bearings	2.6	5

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 NRC Written Examination Outline
 Plant Systems – Tier 2 Group 1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Q#
007 / Pressurizer Relief / Quench Tank							X					A1.01	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including: Maintaining quench tank water level within limits	2.9	6
008 / Component Cooling Water	X											K1.02	Knowledge of the physical connections and/or cause-effect relationships between the CCWS and the following systems: Loads cooled by CCWS	3.3	7
008 / Component Cooling Water		X										K2.02	Knowledge of bus power supplies to the following: CCW pump, including emergency backup	3.0	8
010 / Pressurizer Pressure Control									X			A3.02	Ability to monitor automatic operation of the PZR PCS including: PZR pressure	3.6	9
010 / Pressurizer Pressure Control							X					A1.07	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PZR PCS controls including: RCS pressure	3.7	10
012 / Reactor Protection			X									K3.02	Knowledge of the effect that a loss or malfunction of the RPS will have on the following: Turbine generator	3.2	11
012 / Reactor Protection					X							K5.01	Knowledge of the operational implications of the following concepts as they apply to the RPS: DNB	3.3	12
013 / Engineered Safety Features Actuation				X								K4.03	Knowledge of the ESFAS design feature(s) and/or interlock(s) that provide for the following: Main Steam Isolation System	3.9	13
022 / Containment Cooling								X				A2.05	Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Major leak in CCS	3.1	14

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 NRC Written Examination Outline
 Plant Systems – Tier 2 Group 1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Q#
026 / Containment Spray											X	2.4.21	Emergency Procedures/Plan: Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	4.0	15
039 / Main and Reheat Steam										X		A4.07	Ability to manually operate and/or monitor in the control room: Steam dump valves	2.8	16
059 / Main Feedwater										X		A4.03	Ability to manually operate and/or monitor in the control room: Feedwater control during power increase and decrease	2.9	17
061 / Auxiliary/Emergency Feedwater					X							K5.01	Knowledge of the operational implications of the following concepts as they apply to the AFW: Relationship between AFW flow and RCS heat transfer	3.6	18
061 / Auxiliary/Emergency Feedwater									X			A3.03	Ability to monitor automatic operation of the AFW including: AFW steam generator level control on automatic start	3.9	19
062 / AC Electrical Distribution											X	2.2.12	Equipment Control: Knowledge of surveillance procedures	3.7	20
062 / AC Electrical Distribution										X		A4.04	Ability to manually operate and/or monitor in the control room: Local operation of breakers	2.6	21
063 / DC Electrical Distribution				X								K4.04	Knowledge of the DC electrical system design feature(s) and/or interlock(s) which provide for the following: Trips	2.6	22
064 / Emergency Diesel Generator				X								K4.10	Knowledge of the EDG system design feature(s) and/or interlock(s) which provide for the following: Automatic load sequencer: blackout	3.5	23
064 / Emergency Diesel Generator									X			A3.05	Ability to monitor automatic operation of the EDG system including: Operation of the governor control of frequency and voltage control during parallel operation	2.8	24

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 NRC Written Examination Outline
 Plant Systems – Tier 2 Group 1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Q#
073 / Process Radiation Monitoring								X				A2.01	Ability to (a) predict the impacts of the following malfunctions or operations on the PRM System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Erratic or failed power supply	2.5	25
076 / Service Water		X										K2.08	Knowledge of bus power supplies to the following: ESF actuated MOVs	3.1	26
078 / Instrument Air											X	2.1.30	Conduct of Operations: Ability to locate and operate components, including local controls	4.4	27
103 / Containment			X									K3.02	Knowledge of the effect that a loss or malfunction of the Containment System will have on the following: Loss of containment integrity under normal conditions	3.8	28
K/A Category Point Totals:	2	2	3	4	3	0	2	2 / 2	4	3	3 / 3	Group Point Total:			28 / 5

001 / Control Rod Drive											X	2.2.42	Equipment Control: Ability to recognize system parameters that are entry level conditions for Technical Specifications	4.6	91
029 / Containment Purge												A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Startup operations and the associated required valve lineups	3.1	92
034 / Fuel Handling Equipment				X								K4.01	Knowledge of Fuel Handling Equipment design feature(s) and/or interlock(s) that provide for the following: Fuel protection from binding and dropping	3.4	93
071 / Waste Gas Disposal					X							K5.04	Knowledge of the operational implications of the following concepts as they apply to the Waste Gas Disposal System: Relationship of hydrogen/oxygen concentration to flammability	2.5	29
016 / Non-Nuclear Instrumentation	X											K1.02	Knowledge of the physical connections and/or cause-effect relationships between the NNIS and the following systems: PZR LCS	3.4	30
035 / Steam Generator											X	2.1.7	Conduct of Operations: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation	4.4	31
033 / Spent Fuel Pool Cooling			X									K3.01	Knowledge of the effect that a loss or malfunction of the Spent Fuel Pool Cooling System will have on the following: Area ventilation systems	2.6	32
011 / Pressurizer Level Control											X	A2.04	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PZR LCS controls including: Charging and letdown flows	3.3	33
017 / In-Core Temperature Monitor						X						K6.01	Knowledge of the effect of a loss or malfunction of the following ITM system components: Sensors and detectors	2.7	34

002 / Reactor Coolant						X							K6.02	Knowledge of the effect that a loss or malfunction of the following will have on the RCS: RCP	3.6	35
086 / Fire Protection				X									K4.02	Knowledge of Fire Protection System design feature(s) and/or interlock(s) which provide for the following: Maintenance of fire header pressure	3.0	36
041 / Steam Dump/Turbine Bypass Control										X			A3.02	Ability to monitor automatic operation of the SDS, including: RCS pressure, RCS temperature, and reactor power	3.3	37
068 / Liquid Radwaste										X			A4.04	Ability to manually operate and/or monitor in the control room: Automatic isolation	3.8	38
K/A Category Point Totals:	1	0	1	1 / 1	1	2	0	1 / 1	1	1	1 / 1	Group Point Total:	10 / 3			

			IR	#	IR	#
1. Conduct of Operations	2.1.39	Knowledge of conservative decision making practices			4.3	94
	2.1.35	Knowledge of fuel handling responsibilities of SROs			3.9	95
	2.1.38	Knowledge of the station's verbal requirements when implementing procedures	3.7	66		
	2.1.34	Knowledge of primary and secondary plant chemistry limits	2.7	67		
	2.1.25	Ability to interpret reference materials, such as graphs curves, tables, etc.	3.9	68		
	Subtotal				3	
2. Equipment Control	2.2.1	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity			4.4	96
	2.2.11	Knowledge of the process for controlling temporary design changes			3.3	97
	2.2.13	Knowledge of tagging and clearance procedures	4.1	69		
	2.2.35	Ability to determine Technical Specification Mode of Operation	3.6	70		
	Subtotal				2	
3. 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.			3.8	98
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities	3.4	71		
	2.3.11	Ability to control radiation releases	3.8	72		
	Subtotal				2	
4. Emergency Procedures / Plan	2.4.27	Knowledge of "fire in the plant" procedures			3.9	99
	2.4.1	Knowledge of EOP entry conditions and immediate action steps			4.8	100
	2.4.19	Knowledge of EOP layout, symbols, and icons	3.4	73		
	2.4.49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls	4.6	74		
	2.4.5	Knowledge of the organization of the operating procedures network for normal, abnormal and emergency evolutions	3.7	75		
	Subtotal				3	
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
2 / 1	003 A3.04	Q #01 – Coverage of this K/A topic already addressed by Q #89. Randomly reselected 003 A3.01.
2 / 1	007 A4.01	Q #06 – This specific K/A does not apply as there is no Pressurizer Relief Tank (PRT) Spray Supply Valve associated with the CPNPP PRT. Reselected 007 A1.01 for skyscraper balance.
2 / 1	012 K5.02	Q #12 – This specific K/A does not apply as there is no power density related Reactor Protection System trip at CPNPP. Reselected 012 K5.01.
2 / 1	013 K4.21	Q #13 – This specific K/A does not apply as there is no Service Water Booster Pump at CPNPP. Randomly reselected 013 K4.03.
2 / 1	022 A2.04	Q #14 – This specific K/A does not apply as there is no Service Water interface with Containment Cooling System at CPNPP. Randomly reselected 022 A2.05
2 / 1	059 G 2.4.34	Q #17 – Unable to develop a psychometrically sound question that discriminates at the RO level. Reselected 059 A4.03.
2 / 1	061 A3.04	Q #19 – This specific K/A does not apply as there is no automatic Auxiliary Feedwater isolation at CPNPP. Randomly reselected 061 A3.03.
2 / 1	062 A4.02	Q #21 – This specific K/A does not apply as there is no remote racking of breakers at CPNPP. Randomly reselected 062 A4.04.
2 / 1	063 K4.01	Q #22 – Replaced K/A to avoid ES-401-6 sampling criteria issue. Randomly reselected 063 K4.04.
2 / 1	064 A3.09	Q #24 – This specific K/A does not apply as there is no automatic transfer of the EDG to a startup bank at CPNPP. Randomly reselected 064 A3.05.
2 / 1	076 A1.02	Q #26 – This specific K/A does not apply as there is no Closed Cooling Water System at CPNPP. Reselected 076 K2.08 for skyscraper balance.
2 / 2	011 A2.04	Q #33 – This specific K/A does not apply at CPNPP. Reselected 011 A1.02 for skyscraper balance.
1 / 1	009 EK3.26	Q #40 – Coverage of SBLOCA deemed adequate per Question #35. Reselected 009 EA1.04.
1 / 1	015 G 2.2.3	Q #41 – This specific K/A does not apply as there is no procedural or operational difference between units at CPNPP. Reselected 015 AK2.10.
1 / 1	025 G 2.2.37	Q #43 – Unable to develop a psychometrically sound question that discriminates at the RO level. Randomly reselected 025 G 2.4.9.
1 / 1	027 G 2.4.9	Q #45 – Coverage of this K/A deemed adequate per Question #43. Reselected 027 AA1.01.
1 / 1	029 EK1.02	Q #46 – Coverage of this K/A deemed adequate per Scenario #3. Reselected 029 EK2.06.
2 / 2	035 G 2.4.30	Q #31 – Unable to develop a psychometrically sound question that discriminates at the RO level. Randomly reselected 035 G 2.1.7.
2 / 1	078 K4.02	Q #27 – Unable to develop a psychometrically sound question that discriminates at the RO level. Reselected 078 G 2.1.30 for skyscraper balance.

1 / 1	057 AA2.13	Q #52 – Unable to develop a psychometrically sound question that discriminates at the RO level. Reselected 057 AA1.03.
1 / 1	062 AA1.06	Q #53 – Randomly reselected 062 AA2.04 for skyscraper balance.
1 / 1	065 G 2.1.27	Q #54 – Unable to develop a psychometrically sound question that discriminates at the RO level. Randomly reselected 065 G 2.4.4.
1 / 1	007 EA2.04	Q #78 – Coverage of this K/A topic already addressed by Scenario #3. Randomly reselected 007 EA2.05.
2 / 2	001 G 2.2.36	Q #91 – There are no degraded power sources associated with the Control Rod Drive System that impact Technical Specification LCOs. Randomly reselected G 2.2.42.
2 / 1	073 A2.02	Q #87 – Coverage of this Process Radiation Monitoring System K/A deemed adequate per Question #25. Reselected 006 A2.02.
3 / 2	G 2.2.40	Q #97 – Coverage of 10CFR55.43.3 deemed inadequate on the SRO Exam. Replaced with G 2.2.11.
1 / 1	009 EA1.04	Q #40 – Coverage of this K/A deemed adequate per Question #63. Reselected 009 G 2.1.27 for skyscraper balance.
1 / 1	011 EA2.09	Q #80 – Unable to develop a psychometrically sound question for this K/A as Natural Circulation would not exist during a Large Break LOCA. Reselected 011 EA2.01.
2 / 2	017 K1.01	Q #34 – Reselected 017 K6.01 for skyscraper balance.

Administrative Topics Outline

Facility: CPNPP Units 1 and 2	Date of Examination: 06/06/11	
Examination Level RO <input type="checkbox"/>	Operating Test Number: NRC	
Administrative Topic (see Note)	Type Code*	Describe Activity to be Performed
Conduct of Operations	M, R	2.1.43 Ability to use procedures to determine the effects on reactivity of plant changes, such as Reactor Coolant System temperature, secondary plant, fuel depletion, etc (4.1). JPM: Determine Reactivity Effects When Starting Positive Displacement Charging Pump (RO1310).
Conduct of Operations	N, R	2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. (3.9). JPM: Calculate Pressurizer and Steam Generator Level from Remote Shutdown Panel (RO5115).
Equipment Control	N, R	2.2.12 Knowledge of surveillance procedures (3.7). JPM: Perform Axial Flux Difference Surveillance (RO1808).
Radiation Control	M, R	2.3.12 Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high radiation areas, aligning filters, etc. (3.2). JPM: Determine Radiation Levels during Maintenance (RWT029).
Emergency Plan	—	—
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
*Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

Administrative Topics Outline
Task Summary

- RA1 The applicant will perform the reactivity evaluation for starting a Positive Displacement Charging Pump per SOP-103A, Chemical and Volume Control System, Steps 5.3.1.C and 5.3.1.D. The critical steps include calculating the change in reactivity of the Reactor Coolant System (RCS) and resultant change in RCS temperature caused by the boration/dilution. This is a modified bank JPM.
- RA2 The applicant will calculate Pressurizer and Steam Generator level when operating Unit 1 from the Remote Shutdown Panel per ABN-905A, Loss of Control Room Habitability, Attachment 16, SG Level Temperature Correction and Attachment 17, PRZR Level Temperature Correction. The critical steps include reading the graphs to determine actual levels that meet indicated level requirements. This is a new JPM.
- RA3 The applicant will perform Axial Flux Difference (AFD) Surveillance per OPT-403, Axial Flux Difference and record data on OPT-403-1, AFD Data Sheet. The critical steps include entering surveillance data, comparing the data to an AFD Graph, and determining if Acceptance Criteria is met. This is a new JPM.
- RA4 The applicant will determine radiation levels during maintenance per STA-657, ALARA Job Planning/Debriefing. The critical steps include calculating the dose received in a radiation field with and without protective shielding. This is a modified bank JPM.

Administrative Topics Outline

Facility: CPNPP Units 1 and 2	Date of Examination: 06/06/11	
Examination Level: SRO <input type="checkbox"/>	Operating Test Number: NRC	
Administrative Topic (see Note)	Type Code*	Describe Activity to be Performed
Conduct of Operations	M, R	2.1.43 Ability to use procedures to determine the effects on reactivity of plant changes, such as Reactor Coolant System temperature, secondary plant, fuel depletion, etc (4.3). JPM: Determine Reactivity Effects When Starting Positive Displacement Charging Pump and Evaluate Technical Specifications (SO1017).
Conduct of Operations	N, R	2.1.1 Knowledge of conduct of operations requirements. (4.2) JPM: Determine Technical Specification and Event Reportability (SO1005).
Equipment Control	N, R	2.2.12 Knowledge of surveillance procedures (4.1). JPM: Perform Axial Flux Difference Surveillance and Evaluate Technical Specifications (SO1202).
Radiation Control	M, R	2.3.12 Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high radiation areas, aligning filters, etc. (3.7). JPM: Determine Radiation Levels and Reporting Requirements (SO1112).
Emergency Plan	N, R	2.4.41 Knowledge of the emergency action level thresholds and classifications. (4.6) JPM: Classify an Emergency Plan Event (SO1136).
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
*Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; \leq for 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

Administrative Topics Outline
Task Summary

- SA1 The applicant will perform the reactivity evaluation for starting a Positive Displacement Charging Pump per SOP-103A, Chemical and Volume Control System, Steps 5.3.1.C and 5.3.1.D. The critical steps include calculating the change in reactivity of the Reactor Coolant System (RCS), resultant change in RCS temperature caused by the boration/dilution, and Technical Specification REQUIRED ACTION when Chemistry reports an out of specification Refueling Water Storage Tank boron concentration. This is a modified bank JPM.
- SA2 The applicant will identify impacted Technical Specification Limiting Conditions for Operations and determine Event Reportability per STA-501, Non-Routine Reporting and CPNPP Technical Specifications for a high Station Service Water temperature. The critical steps include identifying the Technical Specification and determining the oral and written Reporting Requirements. This is a new JPM.
- SA3 The applicant will perform Axial Flux Difference (AFD) Surveillance and per OPT-403, Axial Flux Difference and record data on OPT-403-1, AFD Data Sheet. The critical steps include entering surveillance data, comparing the data to an AFD Graph, determining if Acceptance Criteria is met, and identifying any impacted Technical Specification Limiting Conditions for Operations. This is a new JPM.
- SA4 The applicant will determine radiation levels during maintenance per STA-657, ALARA Job Planning/Debriefing and STA-501, Nonroutine Reporting. The critical steps include calculating the dose received in a radiation field with and without protective shielding and determining the proper oral notification when an overexposure occurs. This is a modified bank JPM.
- SA5 The applicant will classify an Emergency Plan event per EPP-201, Assessment of Emergency Action Levels, Emergency Classification, and Plan Activation. The critical steps include determining the Event Category and Event Classification using the newly formatted Hot and Cold Emergency Action Level Classification Charts. This is a new JPM.

Facility:	CPNPP Units 1 and 2	Date of Examination:	06/06/11
Exam Level:	RO <input type="checkbox"/> SRO(I) <input type="checkbox"/> SRO (U) <input checked="" type="checkbox"/>	Operating Test No.:	NRC
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
S-1	001 – Control Rod Drive System (New) Respond to a Dropped Control Rod (RO ONLY)	A, N, S	1
S-2	004 – Chemical and Volume Control System (RO1310A) Start the PDP and Secure the CCP	D, S	2
S-3	010 – Pressurizer Pressure Control System (RO1205A) PORV Block Valve Operability Test	A, D, EN, S	3
S-4	005 – Residual Heat Removal System (RO1507) Transfer Residual Heat Removal Pumps and Safety Injection Pumps to Hot Leg Recirculation	A, EN, M, S	4P
S-5	041 – Steam Dump System (RO3007) Transfer Steam Dump System to Steam Pressure Mode	D, L, S	4S
S-6	026 – Containment Spray System (RO1702) Verify Containment Spray Not Required	A, D, S	5
S-7	062 – AC Electrical Distribution System (New) Shift Normal Bus 1A4 Between UAT and SUT	A, N, S	6
S-8	029 – Component Cooling Water (RO3603) Remove Train A CCW Safeguards Loop from Service	D, S	8
In-Plant Systems [®] (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)			
P-1	039 –Main and Repeat Steam System (AO3005) Locally Control Steam Generator Atmospheric Relief Valve	D, E, R	4S
P-2	073 – Process Radiation Monitoring System (New) Restore Condenser Off Gas Radiation Detector Dryer	N	7
P-3	086 – Fire Protection System (New) Respond to Fire in Service Water Intake Structure	E, N, R	8

<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	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered safety feature	- / - / ≥ 1 (control room system)
(L)ow Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

NRC JPM Examination
Summary Description

- S-1 The applicant will respond to a dropped Control Rod per ABN-712, Rod Control System Malfunction, Section 3.0, Dropped or Misaligned Control Rod in MODE 1 or 2. The alternate path requires a Reactor trip when two Control Rods drop into the core. This is a new JPM under the Control Rod Drive System – Reactivity Control Safety Function.
- S-2 The applicant will start a Positive Displacement Pump and secure the Centrifugal Charging Pump per SOP-103A, Chemical and Volume Control System, Section 5.3.1, Positive Displacement Pump Startup. This is a bank JPM under the Chemical and Volume Control System – Reactor Coolant System Inventory Control Safety Function.
- S-3 The applicant will perform the PORV Block Valve Operability Test per OPT-109A, PORV Block Valve Test. The alternate path requires closing the PORV Block Valve when PORV 456 fails open during testing. This is a bank JPM under the Pressurizer Pressure Control System – Reactor Pressure Control Safety Function. This is a PRA significant action.
- S-4 The applicant will transfer Residual Heat Removal Pumps and Safety Injection Pumps to Hot Leg Recirculation per EOS-1.4A, Transfer to Hot Leg Recirculation. The alternate path occurs when the Safety Injection to Hot Legs 2 & 3 Injection Isolation Valve fails to open at Step 2d. This is a modified bank JPM under the Residual Heat Removal System – Primary System Heat Removal from Reactor Core Safety Function. This is a PRA significant action.

- S-5 The applicant will transfer the Steam Dump System to the Steam Pressure Mode prior to performing a cooldown per IPO-009A, Plant Equipment Shutdown Following a Trip, Step 5.45, Transfer Steam Dump System to Steam Pressure Mode. This is a bank JPM under the Steam Dump System and Turbine Bypass Control – Secondary System Heat Removal from Reactor Core Safety Function.
- S-6 The applicant will perform the actions for EOP-0.0A, Reactor Trip or Safety Injection, Step 7, Verify Containment Spray Not Required. The alternate path occurs when several valves fail to operate when Phase B of Containment Isolation is actuated. This is a bank JPM under the Containment Spray System – Containment Integrity Safety Function. This is a PRA significant action.
- S-7 The applicant will shift Normal Bus 1A4 between the Unit Auxiliary Transformer and the Startup Transformer per SOP-603A, 6900 V Switchgear, Step 5.3.2, Transferring a 6.9 KV Normal Bus from Unit 1 Auxiliary Transformer 1UT to Station Service Transformer 1ST. The alternate path occurs when Incoming Breaker 1A4-1 fails to trip during Bus transfer. This is a new JPM under the AC Electrical Distribution System – Electrical Safety Function.
- S-8 The applicant will perform the actions to remove the Train A Safeguards Loop from service per SOP-502A, Component Cooling Water System, Section 5.3.2, Removal/Restoration of Train A Safeguards Loop from Service. This is a bank JPM under Component Cooling Water System – Plant Service Systems Safety Function.
- P-1 The applicant will perform the actions to locally control the Atmospheric Relief Valve on Steam Generator u-03 per ABN-301, Instrument Air System Malfunction, Attachment 11, Local Control of SG Atmospheric Relief Valves. This is a bank JPM under the Main and Reheat Steam System – Secondary System Heat Removal from the Reactor Core Safety Function. This is a PRA significant action.
- P-2 The applicant will perform local actions to restore the Condenser Off Gas Radiation Detector Dryer per SOP-309A(B), Condenser Vacuum and Water Box Priming System, Section 5.3.4, Bypassing/Restoring Condenser off Gas Radiation Detector 2959 Dryer. This is a new JPM under the Process Radiation Monitoring System – Instrumentation Safety Function.
- P-3 The applicant will perform actions for a fire in the Service Water Intake Structure by aligning an alternate power supply to a Train B Residual Heat Removal Valve per ABN-808A(B), Response to Fire in Service Water Intake Structure, Attachment 2, Alternate Power Supply Hookup for 1(2)-8701B. This is a new JPM under the Fire Protection System – Plant Service Systems Safety Function. This is a PRA significant action.

Facility:		CPNPP 1 and 2		Date of Exam:		06/06/11		Operating Test No.:		NRC							
A P P L I C A N T	E V E N T T Y P E	SCENARIOS															
		CPNPP #1			CPNPP #3									T O T A L	MINIMUM(*)		
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION				R	I	U
		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				
SROI-1	RX	-	3	-	-	-	-							1	1	1	0
	NOR	-	-	-	1,2	-	-							2	1	1	1
	I/C	-	1,2,5,7,9	-	3,4	-	-							7	4	4	2
	MAJ	-	4	-	5	-	-							2	2	2	1
	TS	-	-	-	3,4	-	-							2	0	2	2
SROI-2	RX	-	3	-	-	-	-							1	1	1	0
	NOR	-	-	-	1,2	-	-							2	1	1	1
	I/C	-	1,2,5,7,9	-	3,4	-	-							7	4	4	2
	MAJ	-	4	-	5	-	-							2	2	2	1
	TS	-	-	-	3,4	-	-							2	0	2	2
SROU-1	RX	-	-	-	-	-	-							0	1	1	0
	NOR	3	-	-	1,2	-	-							3	1	1	1
	I/C	1,2	-	-	3,4	-	-							4	4	4	2
	MAJ	4	-	-	5	-	-							2	2	2	1
	TS	1,2	-	-	3,4	-	-							4	0	2	2
SROU-2	RX	-	-	-	-	-	-							0	1	1	0
	NOR	3	-	-	-	-	1,2							3	1	1	1
	I/C	1,2	-	-	-	-	4,7							4	4	4	2
	MAJ	4	-	-	-	-	5							2	2	2	1
	TS	1,2	-	-	-	-	-							2	0	2	2
SROU-3	RX	-	-	-	-	-	-							0	1	1	0
	NOR	3	-	-	-	-	1,2							3	1	1	1
	I/C	1,2	-	-	-	-	4,7							4	4	4	2
	MAJ	4	-	-	-	-	5							2	2	2	1
	TS	1,2	-	-	-	-	-							2	0	2	2
SROU-4	RX	-	-	-										0	1	1	0
	NOR	3	-	-										1	1	1	1
	I/C	1,2	-	-										2	4	4	2
	MAJ	4	-	-										1	2	2	1
	TS	1,2	-	-										2	0	2	2
SROU-5	RX				-	-	-							0	1	1	0
	NOR				1,2	-	-							2	1	1	1
	I/C				3,4	-	-							2	4	4	2
	MAJ				5	-	-							1	2	2	1
	TS				3,4	-	-							2	0	2	2

Facility:		CPNPP 1 and 2		Date of Exam:		06/06/11		Operating Test No.:		NRC							
A P P L I C A N T	E V E N T T Y P E	SCENARIOS															
		CPNPP #1			CPNPP #3									T O T A L	MINIMUM(*)		
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION				R	I	U
		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				
RO-1	RX	-	3	-	-	-	-							1	1	1	0
	NOR	-	-	-	-	-	1,2							2	1	1	1
	I/C	-	1,2,5,7,9	-	-	-	4,7							7	4	4	2
	MAJ	-	4	-	-	-	5							2	2	2	1
	TS	-	-	-	-	-	-							0	0	2	2
RO-2	RX	-	-	-	-	2	-							1	1	1	0
	NOR	-	-	3	-	-	-							1	1	1	1
	I/C	-	-	2,6,8	-	3,6,8	-							6	4	4	2
	MAJ	-	-	4	-	5	-							2	2	2	1
	TS	-	-	-	-	-	-							0	0	2	2
RO-3	RX	-	-	-	-	2	-							1	1	1	0
	NOR	-	-	3	-	-	-							1	1	1	1
	I/C	-	-	2,6,8	-	3,6,8	-							6	4	4	2
	MAJ	-	-	4	-	5	-							2	2	2	1
	TS	-	-	-	-	-	-							0	0	2	2
RO-4	RX	-	-	-	-	2	-							1	1	1	0
	NOR	-	-	3	-	-	-							1	1	1	1
	I/C	-	-	2,6,8	-	3,6,8	-							6	4	4	2
	MAJ	-	-	4	-	5	-							2	2	2	1
	TS	-	-	-	-	-	-							0	0	2	2
RO-5	RX	-	3	-	-	-	-							1	1	1	0
	NOR	-	-	-	-	-	1,2							2	1	1	1
	I/C	-	1,2,5,7,9	-	-	-	4,7							7	4	4	2
	MAJ	-	4	-	-	-	5							2	2	2	1
	TS	-	-	-	-	-	-							0	0	2	2
RO-6	RX	-	-	-	-	2	-							1	1	1	0
	NOR	-	-	3	-	-	-							1	1	1	1
	I/C	-	-	2,6,8	-	3,6,8	-							6	4	4	2
	MAJ	-	-	4	-	5	-							2	2	2	1
	TS	-	-	-	-	-	-							0	0	2	2

Facility:	CPNPP 1 & 2	Scenario No.:	1	Op Test No.:	June 2011 NRC
Examiners:	_____	Operators:	_____	_____	_____
Initial Conditions:	<ul style="list-style-type: none"> 100% power MOL - RCS Boron is 908 ppm (by sample). 				
Turnover:	Maintain steady-state power conditions.				
Critical Tasks:	<ul style="list-style-type: none"> Manually Initiate Safety Injection Upon Failure to Automatically Actuate. Identify and Isolate Faulted Steam Generator 1-03. 				
Event No.	Malf. No.	Event Type*	Event Description		
1 +10 min	RP05B	I (RO, SRO) TS (SRO)	Reactor Coolant System Loop 2 T _{COLD} Instrument (TI-421A) Fails High.		
2 +30 min	ED07B	C (RO, BOP, SRO) TS (SRO)	Loss of Protection Bus IV1PC2.		
3 +50 min	TU04	R (RO) N (BOP, SRO)	Main Turbine Bearing Vibration at 10.5 mils (180 second ramp). Power Reduction to Lower Main Turbine Vibration.		
4 +55 min	MS02	M (RO, BOP, SRO)	Main Steam Header Leak Outside Containment (300 second ramp).		
5 +55 min	RP07A RP07B	I (RO)	Safety Injection Trains A and B Fail to Automatically Actuate.		
6 +55 min	RP08B	I (BOP)	Manual Safety Injection Train B Failure at CB-07.		
7 +55 min	MS08C	C (RO)	Steam Generator (1-03) Main Steam Isolation Valve (HV-2335A) Fails to Close.		
8 +60 min	RH01C	C (BOP)	Residual Heat Removal Pump (1-01) Auto Start Failure on Safety Injection Signal.		
9 +60 min	CS02E	C (RO)	Containment Spray Pump (1-01) Auto Start Failure on Safety Injection Signal.		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Technical Specifications					

Facility:	CPNPP 1 & 2	Scenario No.:	2	Op Test No.:	June 2011 NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions:	<ul style="list-style-type: none"> 72% power MOL - RCS Boron is 975 ppm by Chemistry sample. 				
Turnover:	Maintaining 72% power per Load Controller direction. Rod Control in AUTO.				
Critical Tasks:	<ul style="list-style-type: none"> Identify Excess Reactor Coolant System Leakage and Manually Trip Reactor. Identify and Isolate the Ruptured Steam Generator. Cooldown and Depressurize the Reactor Coolant System. 				
Event No.	Malf. No.	Event Type*	Event Description		
1 +5 min		N (BOP, SRO)	Recirculate RWST using Containment Spray Pump (1-01).		
2 +10 min	CV16A	I (RO, SRO)	Volume Control Tank Level Transmitter (LT-112) Failure.		
3 +15 min	MS13D	I (BOP, SRO)	Atmospheric Relief Valve (1-04) Fails Open due to Steam Pressure Transmitter (PT-2328) Failure.		
4 +25 min	CV01B	C (RO, SRO) TS (SRO)	Centrifugal Charging Pump (1-01) Trip.		
5 +45 min	SG01D	R (RO) N (BOP, SRO) TS (SRO)	Steam Generator (1-04) Tube Leak at 2.5 GPM (180 second ramp).		
6 +48 min	SG01D	M (RO, BOP, SRO)	Steam Generator (1-04) Tube Rupture at 500 GPM (180 second ramp).		
7 +50 min	RP01	I (RO)	Automatic Reactor Trip Failure.		
8 +55 min	RP09A RP09B	C (BOP)	Containment Isolation Phase A Train A and Train B Auto Actuation Failure.		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Technical Specifications					

SCENARIO SUMMARY NRC #2

The crew will assume the watch at 72% power with no scheduled activities per IPO-003A, Power Operations. The Grid Controller has requested that power remain at this level due to transmission line overload until further notice.

The scenario begins with a recirculation of the Refueling Water Storage Tank per SOP-204A, Containment Spray System, following makeup to restore tank level. The Containment Spray Pump will remain operating during the scenario.

The first event is a failure of the Volume Control Tank Level Transmitter. The crew will reference annunciator ALM-0061A-4.5, VCT LEVEL LO, and ABN-105, Chemical and Volume Control System Malfunction, and establish an Alternate Operating Mode for the Reactor Makeup System.

When conditions are stable, the Atmospheric Relief Valve (ARV) on Steam Generator 1-04 will fail open. This event is recognized by a Reactor power increase, ARV Controller indicating 100% demand, and a Plant Computer System alarm. The BOP will place the affected Controller in MANUAL and close the ARV. ABN-709, Steam Line Pressure Instrument Malfunction, may be referenced.

When plant parameters are stable, a loss of the running Centrifugal Charging Pump will occur. The crew will enter ABN-105, Chemical and Volume Control System Malfunction, and perform actions to immediately restore Charging flow. The SRO will refer to Technical Specifications.

The next event is a Steam Generator tube leak of ~2.5 GPM. Crew actions are per ABN-106, High Secondary Activity. Given the size of the leak, a rapid power reduction will be performed. The SRO will refer to Technical Specifications.

When Technical Specifications are referenced and power has been reduced from 3% to 5%, a Steam Generator Tube Rupture occurs and leakage rises to 500 GPM. An uncontrolled loss of Pressurizer level will require a manual Reactor trip, initiation of Safety Injection, and entry into EOP-0.0A, Reactor Trip or Safety Injection. At Step 13, a transition to EOP-3.0A, Steam Generator Tube Rupture, will occur to isolate the ruptured Steam Generator. The event is complicated by a failure of Train A and B Containment Isolation Phase A.

The scenario is terminated when the ruptured Steam Generator is isolated, feedwater flow is properly aligned, and a Reactor Coolant System cooldown is completed.

Risk Significance:

- Failure of risk important system prior to trip: Centrifugal Charging Pump Trip
- Risk significant core damage sequence: Steam Generator Tube Rupture
- Risk significant operator actions: Manually Trip the Reactor
Identify and Isolate the Ruptured SG
Manually Initiate Containment Isolation
Cooldown and Depressurize the RCS

Facility:	CPNPP 1 & 2	Scenario No.:	3	Op Test No.:	June 2011 NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions:	<ul style="list-style-type: none"> • ~3% power BOL - RCS Boron is 1659 ppm by Chemistry sample. • Steam Dump System in service for RCS Temperature Control. 				
Turnover:	Raise Reactor Power from 3% to 8% in preparation for Turbine Startup.				
Critical Tasks:	<ul style="list-style-type: none"> • Manually Trip the Reactor Upon Failure of Reactor to Trip. • Emergency Borate due to Anticipated Transient Without Trip. 				
Event No.	Malf. No.	Event Type*	Event Description		
1 +15 min		N (BOP, SRO)	Transfer from Auxiliary Feedwater System to Main Feedwater System and Place Feedwater Bypass Control Valves in AUTO.		
2 +30 min		R (RO) N (BOP, SRO)	Raise power to 8% in preparation for synchronizing the Main Generator to the electrical grid.		
3 +40 min	RX08A	I (RO, SRO) TS (SRO)	Pressurizer Pressure Transmitter (PT-455) fails low.		
4 +50 min	RX04D	I (BOP, SRO) TS (SRO)	Steam Generator (1-04) Level Transmitter (LT-554) Fails Low.		
5 +51 min	RC07A	M (RO, BOP, SRO)	Reactor Coolant Pump (1-01) Trip.		
6 +52 min	RP13C	I (RO)	Manual Reactor Trip Failure (both).		
7 +52 min	OVRDE	C (BOP)	Bus Breaker CS-1B4-1 Fails to Open.		
8 +62 min	CV01B	C (RO)	Centrifugal Charging Pump (1-01) Trip after Transition Brief to EOS-0.1A.		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Technical Specifications					

SCENARIO SUMMARY NRC #3

The crew will assume the watch with power at approximately 3% per IPO-002A, Plant Startup from Hot Standby. The crew will transfer Feedwater flow from the Auxiliary Feedwater System to the Main Feedwater System in preparation for raising power to 8%. This is followed by entry into SOP-304A, Auxiliary Feedwater System, Section 5.2, Shutdown and Standby of the Auxiliary Feedwater System.

When transfer of Feedwater has been completed, the crew will enter IPO-003A, Power Operations, Section 5.1, Warmup and Synchronization of the Turbine Generator and perform a power ascension using the Rod Control and Steam Dump Systems.

When power has been raised 3% to 5%, a Pressurizer Pressure Channel will fail low. Response is per ABN-705, Pressurizer Pressure Malfuction, Section 2.0, to ensure Pressurizer Heaters are controlled and Power Operated Relief Valves remain closed. The SRO will refer to Technical Specifications.

The next event is a Steam Generator Level Transmitter failure. Actions are per ABN-710, Steam Generator Level Instrumentation Malfuction. The BOP will be required to take manual control of the Feedwater Bypass Control Valve and then select an alternate controlling channel to return the Feedwater System to automatic control. The SRO will refer to Technical Specifications.

When Technical Specifications are addressed, a Reactor Coolant Pump will trip. Although an automatic Reactor trip is not generated, the RO should recognize the requirement to manually trip the Reactor. An attempt will be made to manually trip the Reactor via the normal Trip Switches and by deenergizing both buses supplying the Control Element Drive Mechanism Motor Generators. Once it is determined that neither of these methods have been successful, the crew will transition from EOP-0.0A, Reactor Trip or Safety Injection, to FRS-0.1A, Response to Nuclear Power Generation/ATWT.

When operators are dispatched, emergency boration is initiated, and the Reactor is locally tripped, the crew will transition from FRS-0.1A to EOP-0.0A. After it is determined that Safety Injection is not required the crew will enter EOS-0.1A, Reactor Trip Response and perform actions to restore Charging and Letdown flow. When in EOS-0.1A, a Centrifugal Charging Pump will trip and must be restarted to continue emergency boration.

The scenario is terminated when IPO-009A, Plant Equipment Shutdown Following a Trip, is referenced while in EOS-0.1A.

Risk Significance:

- Risk significant core damage sequence:
 - Anticipated Transient Without Trip
 - Manual Reactor Trip Failure (RPS)
 - Manual Reactor Trip Failure (Electrical)
- Risk significant operator actions:
 - Manually Trip Reactor Due to RCP Trip
 - Locally Open Reactor Trip Breakers
 - Emergency Borate Due to ATWT
 - Centrifugal Charging Pump Trip

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 <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.
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.
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.