OUTLINE FOR THE DONALD C. COOK INITIAL RETAKE EXAMINATION - SEPTEMBER 10, 2001

Facility: DCCook **Date of Examination:** 09/10/2001

Item	Task Description	Initials a	Initials b*	Initials c#	
1. WRITTEN	a. Verify that the outline(s) fit(s) the appropriate model per ES-401.				
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all K/A categories are appropriately sampled.				
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.				*
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.				**
2. SIM	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.	NA	NA	NA	
	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 over successive days.	NA	NA	NA	
	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.	NA	NA	NA	
3. W/T	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.	NA	NA	NA	
	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) 40% 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.	NA	NA	NA	
	c. Verify that the required administrative topics are covered, with emphasis on performance-based activities.	NA	NA	NA	
	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 successive days.	NA	NA	NA	
4. GENERAL	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam section.	NA	NA	NA	
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.	NA	NA	NA	
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	NA	NA	NA	
	d. Check for duplication and overlap among exam sections.	NA	NA	NA	
	e. Check the entire exam for balance of coverage.	NA	NA	NA	
	f. Assess whether the exam fits the appropriate job level (RO or SRO).	NA	NA	NA	

	Printed Name / Signature	Date
a. Author	Arnold M. Bailey /	07/20/01
b. Facility Reviewer (*)	RONALD G. BROWN /	7/20/01
c. NRC Chief Examiner (#)	Hironori Peterson /	7/25/01
d. NRC Supervisor	David Hills /	7/25/01

Note: * Not applicable for NRC-developed examinations.
Independent NRC reviewer initial items in Column "c;" chief examiner concurrence required.

* yes, it appears that four areas may be over-emphasized. (RCPs; DC power (BATT); SGTR; CCW)

** The two K/A's rejected, their reasons were unclear and also inaccurate. Tier 1 Group 1 K/A EPE 068 G 2.4.24 does not have a clear understandable reason for rejection. Tier 1 Group 1 K/A 072 K4.03 the reason for rejection does not match the system, i.e. reason is for Control Room evac on loss of cooling water, but the K/A is for ARM sys on plant ventilation. meets the minimum.

(Info relayed to licensee for correction. 7/25/01) Outline received Monday 7/23/01.

AEP AMERICAN® ELECTRIC POWER

AEP: America's Energy Partner℠

Date: **7/20/01**

Subject: **NRC Written Retake Exam Outline**

From: **Mick Brown** RGB

To: **Pete Peterson, NRC Region III**

Enclosed you will find the Donald C Cook Nuclear Plant SRO Examination Outline (Form ES-401-3) for the written retake that we requested for the week of September 10, 2001. The outline was computer generated using Version 1.1.0 of the PWR K/A Catalog Software developed by WD Associates, Inc. This software was developed and approved under the oversight of the Westinghouse Owners Group, and widely disseminated to all WOG members for use in developing a systematic and random examination outline to meet NRC requirements in ES-401 of NUREG-1021, Operator Licensing Examination Standards for Power Reactors, Revision 8, Supplement 1.

The SRO Examination Outline was developed using a systematic selection process to randomly generate a valid NRC K/A matrix to match the K/A categories listed on Form ES-401-3. The random K/A selection was independently reviewed and verified to meet the requirements of Section D.1 of ES-401.

It is our understanding that you will independently review the submitted outline, and provide comments and recommended changes to us within five working days. A prompt review and feedback will expedite our effort to provide you the proposed examination during the week of August 6, 2001, as requested.

Facility: DCCook **Date of Exam**: 09/10/2001 **Exam Level**: SRO

Tier	Group	K/A Category Points											Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G *	
1. Emergency & Abnormal Plant Evolutions	1	4	2	3				4	7			4	24
	2	2	2	2				3	4			3	16
	3	1	1	0				1	0			0	3
	Tier Totals	7	5	5				8	11			7	43
2. Plant Systems	1	2	2	2	2	1	2	1	2	2	2	1	19
	2	2	1	1	2	1	2	1	1	2	2	2	17
	3	1	0	1	0	0	0	0	0	1	0	1	4
	Tier Totals	5	3	4	4	2	4	2	3	5	4	4	40

3. Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	17
	4	5	4	4	

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).
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 exam must total 100 points.
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.
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 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.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO 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.

PWR SRO Examination Outline

Printed: 07/20/2001

Facility: Donald C. Cook Nuclear Plant

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-3**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
003	Dropped Control Rod / 1		X					AK2.05 - Control rod drive power supplies and logic circuits	2.8	1
005	Inoperable/Stuck Control Rod / 1					X		AA2.03 - Required actions if more than one rod is stuck or inoperable	4.4	1
011	Large Break LOCA / 3			X				EK3.12 - Actions contained in EOP for emergency LOCA (large break)	4.6	1
015	Reactor Coolant Pump (RCP) Malfunctions / 4					X		AA2.08 - When to secure RCPs on high bearing temperature	3.5	1
015	Reactor Coolant Pump (RCP) Malfunctions / 4						X	2.1.7 - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	1
024	Emergency Boration / 1			X				AK3.02 - Actions contained in EOP for emergency boration	4.4	1
026	Loss of Component Cooling Water (CCW) / 8					X		AA2.06 - The length of time after the loss of CCW flow to a component before that component may be damaged	3.1*	1
026	Loss of Component Cooling Water (CCW) / 8						X	2.4.49 - Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	1
029	Anticipated Transient Without Scram (ATWS) / 1	X						EK1.01 - Reactor nucleonics and thermo-hydraulics behavior	3.1	1
029	Anticipated Transient Without Scram (ATWS) / 1				X			EA1.13 - Manual trip of main turbine	3.9	1

PWR SRO Examination Outline

Facility: Donald C. Cook Nuclear Plant

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-3**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
051	Loss of Condenser Vacuum / 4					X		AA2.02 - Conditions requiring reactor and/or turbine trip	4.1	1
055	Loss of Offsite and Onsite Power (Station Blackout) / 6	X						EK1.01 - Effect of battery discharge rates on capacity	3.7	1
057	Loss of Vital AC Electrical Instrument Bus / 6					X		AA2.19 - The plant automatic actions that will occur on the loss of a vital ac electrical instrument bus	4.3	1
059	Accidental Liquid Radwaste Release / 9						X	2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.0	1
067	Plant Fire on Site / 9					X		AA2.14 - Equipment that will be affected by fire suppression activities in each zone	4.3	1
068	Control Room Evacuation / 8						X	2.2.4 - (multi-unit) Ability to explain the variations in control board layouts, systems, instrumentation and procedural actions between units at a facility.	3.0*	1
074	Inadequate Core Cooling / 4				X			EA1.12 - RCS temperature and pressure indicators	4.4	1
076	High Reactor Coolant Activity / 9					X		AA2.07 - When demineralizer resin needs to be replaced	2.7*	1
E02	SI Termination / 3	X						EK1.3 - Annunciators and conditions indicating signals, and remedial actions associated with the SI Termination	3.8	1

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Facility: Donald C. Cook Nuclear Plant

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-3**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
E06	Degraded Core Cooling / 4	X						EK1.2 - Normal, abnormal and emergency operating procedures associated with Degraded Core Cooling	4.1	1
E07	Saturated Core Cooling / 4				X			EA1.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.6	1
E08	Pressurized Thermal Shock / 4				X			EA1.2 - Operating behavior characteristics of the facility	3.9	1
E14	High Containment Pressure / 5			X				EK3.2 - Normal, abnormal and emergency operating procedures associated with High Containment Pressure	3.7	1
E14	High Containment Pressure / 5		X					EK2.2 - Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility	3.8	1

K/A Category Totals: 4 2 3 4 7 4 **Group Point Total:** 24

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Facility: Donald C. Cook Nuclear Plant

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-3

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
007	Reactor Trip / 1				X			EA1.06 - Reactor trip (scram): verification that the control and safety rods are in after the trip	4.5	1
008	Pressurizer (PZR) Vapor Space Accident (Relief Valve Stuck Open) / 3		X					AK2.02 - Sensors and detectors	2.7	1
008	Pressurizer (PZR) Vapor Space Accident (Relief Valve Stuck Open) / 3					X		AA2.19 - PZR spray valve failure, using plant parameters	3.6	1
022	Loss of Reactor Coolant Makeup / 2			X				AK3.02 - Actions contained in SOPs and EOPs for RCPs, loss of makeup, loss of charging, and abnormal charging	3.8	1
032	Loss of Source Range Nuclear Instrumentation / 7			X				AK3.01 - Startup termination on source-range loss	3.6	1
033	Loss of Intermediate Range Nuclear Instrumentation / 7						X	2.4.4 - Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.3	1
033	Loss of Intermediate Range Nuclear Instrumentation / 7				X			AA1.02 - Level trip bypass	3.1	1
037	Steam Generator (S/G) Tube Leak / 3					X		AA2.12 - Flow rate of leak	4.1	1
038	Steam Generator Tube Rupture (SGTR) / 3	X						EK1.03 - Natural circulation	4.2	1
038	Steam Generator Tube Rupture (SGTR) / 3					X		EA2.07 - Plant conditions, from survey of control room indications	4.8	1

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Facility: Donald C. Cook Nuclear Plant

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2** **Form ES-401-3**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
054	Loss of Main Feedwater (MFW) / 4				X			AA1.01 - AFW controls, including the use of alternate AFW sources	4.4	1
058	Loss of DC Power / 6	X						AK1.01 - Battery charger equipment and instrumentation	3.1*	1
060	Accidental Gaseous Radwaste Release / 9						X	2.3.11 - Ability to control radiation releases.	3.2	1
061	Area Radiation Monitoring (ARM) System Alarms / 7					X		AA2.04 - Whether an alarm channel is functioning properly	3.5	1
E16	High Containment Radiation / 9						X	2.4.10 - Knowledge of annunciator response procedures.	3.1	1
E16	High Containment Radiation / 9		X					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.3	1

K/A Category Totals: **2** **2** **2** **3** **4** **3** **Group Point Total:** **16**

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Facility: Donald C. Cook Nuclear Plant

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 3** **Form ES-401-3**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
036	Fuel Handling Incidents / 8		X					AK2.02 - Radiation monitoring equipment (portable and installed)	3.9	1
056	Loss of Offsite Power / 6	X						AK1.01 - Principle of cooling by natural convection	4.2	1
E15	Containment Flooding / 5				X			EA1.2 - Operating behavior characteristics of the facility	2.9	1

K/A Category Totals: 1 1 0 1 0 0 **Group Point Total:** 3

Facility: Donald C. Cook Nuclear Plant

PWR SRO Examination Outline

Printed: 07/20/2001

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-3

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
001	Control Rod Drive System / 1	X											K1.05 - NIS and RPS	4.4	1
003	Reactor Coolant Pump System (RCPS) / 4						X						K6.04 - Containment isolation valves affecting RCP operation	3.1	1
003	Reactor Coolant Pump System (RCPS) / 4								X				A2.02 - Conditions which exist for an abnormal shutdown of an RCP in comparison to a normal shutdown of an RCP	3.9	1
013	Engineered Safety Features Actuation System (ESFAS) / 2							X					A1.10 - T-cold	3.7	1
013	Engineered Safety Features Actuation System (ESFAS) / 2										X		A4.02 - Reset of ESFAS channels	4.4	1
014	Rod Position Indication System (RPIS) / 1			X									K3.02 - Plant computer	2.8*	1
022	Containment Cooling System (CCS) / 5										X		A4.01 - CCS fans	3.6	1
025	Ice Condenser System / 5			X									K3.01 - Containment	3.8*	1
025	Ice Condenser System / 5						X						K6.01 - Upper and lower doors of the ice condenser	3.6*	1
026	Containment Spray System (CSS) / 5								X				A2.03 - Failure of ESF	4.4	1
026	Containment Spray System (CSS) / 5		X										K2.01 - Containment spray pumps	3.6	1

Facility: Donald C. Cook Nuclear Plant

PWR SRO Examination Outline

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ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-3**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
061	Auxiliary / Emergency Feedwater (AFW) System / 4											X	2.4.48 - Ability to interpret control room indications to verify the status and operation of system, and understand how operator actions and directives affect plant and system conditions.	3.8	1
061	Auxiliary / Emergency Feedwater (AFW) System / 4		X										K2.02 - AFW electric driven pumps	3.7	1
063	D.C. Electrical Distribution System / 6	X											K1.03 - Battery charger and battery	3.5	1
063	D.C. Electrical Distribution System / 6				X								K4.01 - Manual/automatic transfers of control	3.0*	1
068	Liquid Radwaste System (LRS) / 9				X								K4.01 - Safety and environmental precautions for handling hot, acidic, and radioactive liquids	4.1	1
071	Waste Gas Disposal System (WGDS) / 9									X			A3.03 - Radiation monitoring system alarm and actuating signals	3.8	1
072	Area Radiation Monitoring (ARM) System / 7									X			A3.01 - Changes in ventilation alignment	3.1	1
072	Area Radiation Monitoring (ARM) System / 7					X							K5.02 - Radiation intensity changes with source distance	3.2	1

K/A Category Totals: 2 2 2 2 1 2 1 2 2 2 1 **Group Point Total:** 19

Facility: Donald C. Cook Nuclear Plant

PWR SRO Examination Outline

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ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-3

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
006	Emergency Core Cooling System (ECCS) / 2	X											K1.03 - RCS	4.3	1
010	Pressurizer Pressure Control System (PZR PCS) / 3									X			A3.02 - PZR pressure	3.5	1
012	Reactor Protection System / 7						X						K6.10 - Permissive circuits	3.5	1
012	Reactor Protection System / 7							X					A1.01 - Trip setpoint adjustment	3.4*	1
016	Non-Nuclear Instrumentation System (NNIS) / 7				X								K4.03 - Input to control systems	2.9*	1
028	Hydrogen Recombiner and Purge Control System (HRPS) / 5											X	2.4.47 - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	3.7	1
035	Steam Generator System (S/GS) / 4										X		A4.06 - S/G isolation on steam leak or tube rupture/leak	4.6	1
055	Condenser Air Removal System (CARS) / 4			X									K3.01 - Main condenser	2.7	1
062	A.C. Electrical Distribution System / 6		X										K2.01 - Major system loads	3.4	1
062	A.C. Electrical Distribution System / 6											X	2.1.27 - Knowledge of system purpose and or function.	2.9	1

Facility: Donald C. Cook Nuclear Plant

PWR SRO Examination Outline

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ES - 401 **Plant Systems - Tier 2 / Group 2** **Form ES-401-3**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
064	Emergency Diesel Generator (ED/G) System / 6				X								K4.11 - Automatic load sequencer: safeguards	4.0	1
064	Emergency Diesel Generator (ED/G) System / 6						X						K6.07 - Air receivers	2.9	1
075	Circulating Water System / 8	X											K1.08 - Emergency/essential SWS	3.2*	1
079	Station Air System (SAS) / 8								X				A2.01 - Cross-connection with IAS	3.2	1
086	Fire Protection System (FPS) / 8					X							K5.04 - Hazards to personnel as a result of fire type and methods of protection	3.5*	1
103	Containment System / 5									X			A3.01 - Containment isolation	4.2	1
103	Containment System / 5										X		A4.04 - Phase A and phase B resets	3.5*	1

K/A Category Totals: 2 1 1 2 1 2 1 1 2 2 2 **Group Point Total:** 17

Facility: Donald C. Cook Nuclear Plant

PWR SRO Examination Outline

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ES - 401

Plant Systems - Tier 2 / Group 3

Form ES-401-3

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
008	Component Cooling Water System (CCWS) / 8											X	2.4.18 - Knowledge of the specific bases for EOPs.	3.6	1
008	Component Cooling Water System (CCWS) / 8	X											K1.02 - Loads cooled by CCWS	3.4	1
076	Service Water System (SWS) / 4									X			A3.02 - Emergency heat loads	3.7	1
078	Instrument Air System (IAS) / 8			X									K3.02 - Systems having pneumatic valves and controls	3.6	1
K/A Category Totals:		**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**Group Point Total:**		**4**

Generic Knowledge and Abilities Outline (Tier 3)

Printed: 07/20/2001

PWR SRO Examination Outline

Facility: Donald C. Cook Nuclear Plant

Form ES-401-5

Generic Category	KA	KA Topic	Imp.	Points
Conduct of Operations	2.1.4	Knowledge of shift staffing requirements.	3.4	1
	2.1.25	Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data.	3.1	1
	2.1.28	Knowledge of the purpose and function of major system components and controls.	3.3	1
	2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	4.0	1
			Category Total:	**4**
Equipment Control	2.2.13	Knowledge of tagging and clearance procedures.	3.8	1
	2.2.17	Knowledge of the process for managing maintenance activities during power operations.	3.5	1
	2.2.22	Knowledge of limiting conditions for operations and safety limits.	4.1	1
	2.2.23	Ability to track limiting conditions for operations.	3.8	1
	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1
			Category Total:	**5**
Radiation Control	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	3.0	1
	2.3.2	Knowledge of facility ALARA program.	2.9	1
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	3.1	1
	2.3.11	Ability to control radiation releases.	3.2	1
			Category Total:	**4**

Generic Knowledge and Abilities Outline (Tier 3)

Printed: 07/20/2001

PWR SRO Examination Outline

Form ES-401-5

Facility: Donald C. Cook Nuclear Plant

Generic Category	KA	KA Topic	Imp.	Points
Emergency Procedures/Plan	2.4.11	Knowledge of abnormal condition procedures.	3.6	1
	2.4.16	Knowledge of EOP implementation hierarchy and coordination with other support procedures.	4.0	1
	2.4.29	Knowledge of the emergency plan.	4.0	1
	2.4.44	Knowledge of emergency plan protective action recommendations.	4.0	1
			Category Total:	**4**
			Generic Total:	**17**

ES-401 Record of Rejected K/As Form ES-401-10

Tier / Group	Randomly Selected K/A	Reason for Rejection
1 / 1	EPE 068 G2.4.24	To meet the requirement of ES-401 Section D.1.e to have a minimum sample of two K/As for each category and ensure diversity of the K/As selected within the same system.
2 / 1	072 K4.03	Control Room Evacuation Procedure does not address the loss of cooling water as a credible failure during a condition requiring an evacuation of the main control room.