

AP-1000 K/A Catalog Internal Review Comments

	Comments	Potential Resolution	Actual Resolution
1	A-327 AK 1.03 Apparent typo with repeat of "Main"	Delete typo	
2	A-329 AK 1 There are two K/A's in NUREG-1122 for Loss of Instrument Air that are not in the AP-1000 K/A Catalog for Loss of Instrument Air: 1) Actions in EOPs for loss of IA (065 AK 3.08) 2) Locations and Isolation of leaks (065 AA 2.03)	Propose adding these KAs with IR >2.5	
3	A-332 K1 There should be a KA for A-332 K1 "Onsite Power System."	Create new KA to address onsite power system.	
4	A-332 K1 There should be a KA for A-332 K1 "Digital Rod Control and Rapid Power Reduction System."	Create new KAs to address rapid power reduction system and digital rod control system.	
5	A-332 K3 There should be a KA for A-332 K3 "Verify Rapid Power Reduction System has initiated if load rejection greater than 50%."	Create new KA to address rapid power reduction system.	
6	A-340 K1 There should be a KA for A-340 K1 "Pressurizer Level Control System."	Create new KA to address Pressurizer Level Control System.	
7	A-343 AA1 There should be a KA for A-343 AA1 "Service Water"	Create new KA to address to address Service Water System.	

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	System.”														
8	A-343 AA2 There should be a KA for A-343 AA2 “Service Water System.” Service Water System to Component Cooling Water System heat exchanger flow	Create new KA to address Service Water System.													
9	A-343 K1 There should be a KA for A-343 K1 “Service Water System”. The relationship between service water that cools component cooling water which cools RHR should be a required knowledge.	Create new KA to address Service Water System.													
10	A-345 AA1 The ability to operate/monitor the service water pumps and the standby diesel generators that power the service water pumps on a loss of normal power to the pumps, should be required knowledge. Currently under A-345 AA1 there are not KA’s to address these components. They should also have IR’s above 2.5	Develop KA’s under AA1 to address the service water pumps and the standby diesel generators.													
11	A-345 K1 Importance ratings are too low for all of the KA’s listed under K1. Considering the wide range of systems and components that are cooled by service water and the impact on plant operations please consider revising upward the importance ratings for this KA. The	Revise KAs to the following: <table border="0" style="width: 100%;"> <tr> <td style="width: 10%;">AK</td> <td style="width: 10%;">1.01</td> <td style="width: 50%;">Booster/main feedwater pumps</td> <td style="width: 10%;">2.9</td> </tr> <tr> <td>AK</td> <td>1.02</td> <td>Compressed and Instrument Air System</td> <td>3.2</td> </tr> <tr> <td>AK</td> <td>1.03</td> <td>Component</td> <td>3.3</td> </tr> </table>	AK	1.01	Booster/main feedwater pumps	2.9	AK	1.02	Compressed and Instrument Air System	3.2	AK	1.03	Component	3.3	
AK	1.01	Booster/main feedwater pumps	2.9												
AK	1.02	Compressed and Instrument Air System	3.2												
AK	1.03	Component	3.3												

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	licensed operator needs the knowledge of what systems will be impacted by a loss of Service Water.	<p style="text-align: center;">Cooling Water System</p> <p>AK 1.04 Condensate pumps 2.5</p> <p>AK 1.05 CVCS letdown hx and/or makeup pumps 2.7</p> <p>AK 1.06 Reactor coolant pumps 3.3</p> <p>AK 1.07 Normal RHR 2.9</p> <p>AK 1.08 Spent Fuel Pool Cooling System 2.8</p>	
12	A-345 K2 The following systems should have individual KA's to test the knowledge of what happens operationally as these systems are lost due to a loss of service water. They should also have IR's above 2.5.	Develop KAs under K2 to address the following systems: Feed pumps Compressed and Instrument Air Component Cooling Water Condensate Pumps CVCS Letdown HX Reactor Coolant Pumps Normal RHR Spent Fuel Pool Cooling	
13	All systems: K6, A2 Stems – The K6 header asks about “the following plant conditions, system malfunctions, or component malfunctions “, and the A2 header asks about “the following malfunctions or operations “. About half of the items listed under each of these headers are systems, rather than conditions or malfs. See proposed stems	<p>Reword the headers to indicate either malfunctions/operations/conditions involving the listed systems OR malfunctions/operations/conditions as listed.</p> <p>K.6 Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the Passive Reactor Coolant System:</p> <p>A.2 Ability to (a) predict the impacts of the following malfunctions or operations on the Passive Residual Heat Removal System and (b) based on those predictions, use procedures to correct, control, or mitigate the</p>	

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		consequences of those malfunctions or operations:	
14	Section 4.1 EPEs No ECA 0.0.	Develop an ECA-0.0 for these units and K/As for testing on it	
15	Time to address SAM	Develop K/As related to SAMGs	
16	Section 4.2 AOPs No AOP for Loss of Spent Fuel Cooling	Develop an AOP for loss of SF Cooling.	
17	FR-I.1 EK1 Since the AP1000 has a High Pressurizer Water Level Reactor Trip, The PSM system should have a unique KA in this section. This should also have a high importance rating.	Add a specific KA to FR-I.1 to include the PSM System.	
18	FR-Z.3 EK1 The Refueling Water Storage Tank (RWST) should have a unique KA in this section. This should also have a high importance rating.	Add a specific KA to FR-Z.3 to include a specific KA or the RWST.	
19	FR-Z.3 EK1 RHR should have a unique KA in this section. This should also have a high importance rating.	Add a specific KA to FR-Z.3 to include a specific KA or the RHR.	
20	SDP-4 EA1 Since the AP1000 has a Source Range High Neutron Flux Trip, The PSM or reactor trip system should have a unique KA in this section. This should also have a high importance rating.	Add a specific KA to SDP-4 EA1 to include the PSM or reactor trip system.	
21	SDP-4 EA1 Since the AP1000 has a Source Range High Neutron Flux Trip, The NI system should have a unique KA in this section. This should also have a high importance rating.	Add a specific KA to SDP-4 EA1 to include the PSM or nuclear instrumentation system.	
22	SDP-4 EK1	Add a specific KA to SDP-4 EK1 to include the	

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	Since the AP1000 has a Source Range High Neutron Flux Trip, The PSM system should have a unique KA in this section. This should also have a high importance rating.	PSM system.	
23	SDP-4 EK2 Since SDP-4 EK3 3.01 is "Isolating demin water and dilution paths and/or aligning makeup pumps to the boric acid tank," EK2 should have a corresponding KA that addresses the cause and effect relationship of diluting the primary and rising source range counts.	Add a specific KA to SDP-4 EK2 to include the dilution of the primary coolant.	
24	SDP-6 All KA's for SDP-6 "Response to Unexpected Reactor Coolant System Temperature Changes During Shutdown" are written without addressing secondary side causes of reactor coolant system temperature changes. It is possible SDP-6 was only intended to be applicable in cold shutdown. If this is the case then SDP-6 needs to be changed to make that clear.	Evaluate SDP-6 to add secondary side causes to temperature changes when shutdown. This should include EK1, 2 and 3, EA 1 and EA 2.  If it is decided that SDP-6 is only applicable to cold shutdown, then change the KA statement to reflect cold shutdown instead of shutdown.	
25	2.2.4 This seems redundant to 2.2.3	Delete 2.2.4.	
26	2.2.16 Is there a difference between pre and post maintenance operability requirements? Is this K/A intended to test on post maintenance retesting requirements?	Reword as: Knowledge of post-maintenance retesting requirements to verify or restore operability.	
27	2.2.25 KA 2.2.25 was changed to limit ability to those < 1 hr statements that require a reactor shutdown. This change seems arbitrary and	Restore wording to that of equivalent Generic KA in NUREG- 1122.	

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	<p>not founded on relative safety importance of knowing the S/D specs as opposed to any other spec requiring prompt action that does not include a S/D. TS for existing plants include actions that must be performed IMMEDIATELY, where the time for action is based on safety significance of the condition. Examples:</p> <ol style="list-style-type: none"> <li>1) with IN sufficient forced RCS flow, IMMEDIATELY suspend dilution operations</li> <li>2) with NO operable cntmt purge isolation signal capability and purge valves open, IMMEDIATELY suspend core alterations</li> <li>3) with RCS temp/pressure exceeding limits, IMMEDIATELY initiate action to restore to within limits</li> <li>4) with head removed in MODE 6 and &lt; 23 feet of water above fuel, if one SDC train is INOP, IMMEDIATELY initiate action to restore or to establish &gt; 23 feet of water.</li> </ol>		
28	<p>2.4.1 KA 2.4.1 was changed. Original is "Knowledge of EOP entry conditions and immediate action steps."</p> <p>This seems like it is still be a legitimate ability. It is not design dependent, rather procedurally driven. If a site writes procedures with immediate actions then the KA</p>	<p>Change wording of KA 2.4.1 in AP1000 catalogue to address immediate action steps.</p>	<p>There are not procedural immediate action steps.</p>

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	would be applicable.		
29	<p>2.4.6 Recommend keep original KA 2.4.6 "Knowledge of Emergency Operating Procedures mitigation strategies.</p> <p>Also take out "for." This does not read well.</p>	<p>Recommend keep original KA 2.4.6 "Knowledge of Emergency Operating Procedures mitigation strategies.</p>	<p>Major action categories are a term used by Westinghouse to address mitigation strategies.</p> <p>agree</p>
30	<p>2.4.29 Recommend removing Implementing. "Knowledge of the lines of authority during implementation of the Emergency Plan Procedures."</p>	<p>Recommend removing Implementing. "Knowledge of the lines of authority during implementation of the Emergency Plan Procedures.</p>	<p>The procedures are called 'Emergency Plan Implementing Procedures.' The term 'Emergency Plan Procedures' may have a different meaning.</p>
31	<p>2.4.30 Recommend making RO IR 2.5 or above. RO IR is 2.4. This is no change from the current KA catalogue. The RO IR should be 2.5 or above since the RO frequently is the communicator and a common JPM is to perform the actions of the communicator. This KA would fit that task for an RO if it was above 2.5. Currently this JPM gets assigned a KA of 2.4.31, Knowledge of RO responsibilities in E-Plan Implementing procedures. To actually perform the task is an ability instead of knowledge</p>	<p>Recommend making RO IR 2.5 or above.</p>	
32	<p>2.4.33 Do not agree with changing RO to N/A. Previous IR was 2.9</p> <p>A RO typically has responsibilities in the eplan such as communicator. They need the knowledge of thresholds and classifications. They do not need the ability to perform the</p>	<p>Recommend changing RO IR to 2.9.</p>	<p>This change is based on Region 2 SRO guidance document.</p>

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	SRO responsibility of determining the classification; however they still need training and some knowledge of the system												
33	2.4.36 RO is not responsible for knowing PARs. For consistency N/A would make more sense than an IR of 2.4 for RO's	Recommend N/A for RO instead of 2.4 for importance rating											
34	<p>Section 1.13 lists table 6 which defines the importance ratings as follows:</p> <table border="0" data-bbox="163 605 525 816"> <tr> <td>5</td> <td>Essential</td> </tr> <tr> <td>4</td> <td>Very important</td> </tr> <tr> <td>3</td> <td>Fairly important</td> </tr> <tr> <td>2</td> <td>Of limited importance</td> </tr> <tr> <td>1</td> <td>Insignificant Importance</td> </tr> </table> <p>Therefore, the rating of 2.0 or below represents a statement of limited or insignificant importance for the safe operation of a plant. Such statements are generally considered as inappropriate content for NRC licensing examinations. (See below for qualifications of importance ratings related to variability of the ratings and plant specific data.)</p> <p>NUREG 1021 identifies an IR of 2.5 or above as appropriate for NRC exams. Many IR's in the AP1000 catalogue are between 2.1 and 2.4,</p>	5	Essential	4	Very important	3	Fairly important	2	Of limited importance	1	Insignificant Importance	<p>Recommend that a 2.5 IR be the cutoff for consistency. As an examiner I do not want two different standards. Adjust upward the IR's that are important to 2.5 or above.</p> <p>Add the missing information for importance ratings related to variability and plant specific data, or delete the sentence</p>	<p>Less than 2.5 is not testable.</p>
5	Essential												
4	Very important												
3	Fairly important												
2	Of limited importance												
1	Insignificant Importance												



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	<p>which per the guidance in the AP1000 catalog is testable, but per the NUREG are not testable. The last sentence in parenthesis does not make sense. There is no information below</p>		
35	<p>None Slide 14 of NRC presentation of KA stems states that a KA was added to section 2. “Ability to use integrated control systems to operate plant systems or components.” This KA is not in the rev 0 Draft KA catalogue section 2.</p>	Add the KA to the manual	
36	<p>None KA 2.4.49 was deleted. “Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.”  This seems like it is still be a legitimate ability. It is not design dependent, rather procedurally driven. If a site writes procedures with immediate actions then the KA would be applicable.</p>	Add KA 2.4.49 from the existing PWR catalog to the AP1000 catalog	No immediate actions in AP1000
37	<p>None There is no KA Knowledge of Emergency Operating Procedures.  There are the following KA’s 2.4.9 Knowledge of Abnormal Operating Procedures. 2.4.20 Knowledge of Fire Protection Procedures 2.4.23 Knowledge of the Emergency Plan Implementing Procedures</p>	<p>Create a KA for EOP’s that is similar to other procedural KA’s.  i.e KA 2.4.XX Knowledge of Emergency Operating Procedures.</p>	

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	<p>Since other procedure types have specific KA's, it would be consistent to have a specific KA for Knowledge of EOP's. The KA would have a high importance rating. This is a flaw in the current catalogue also.</p>		
38	<p>Emergency Operating Procedures, Shutdown Emergency Operating Procedures, or Abnormal Operating Procedures K2 K2 (which was K1 in the old KA catalogue) includes concepts important to successful procedural implementation. However when you compare all K2's to the old K1's, there is no KA's which address the knowledge of the EOP/Abnormal procedures themselves.</p> <p>The old E08 Pressurized Thermal Shock K1 was for example: EK1. Knowledge of the operational implications of the following concepts as they apply to the (Pressurized Thermal Shock) EK1.2 Normal, abnormal and emergency operating procedures associated with (Pressurized Thermal Shock).</p> <p>The new K2 KA for PTS is: Knowledge of the operational implications or cause and effect relationships of the following as they apply to PTS: EK 2.01 Reactor Coolant System loss of coolant accident, faulted</p>	<p>For the section of the KA catalogue that deals with Emergency Operating Procedures, Shutdown Emergency Operating Procedures, or Abnormal Operating Procedures, there needs to be specific KA's that test the knowledge of the various procedures. It is probably good to test the concepts of the event like K2 is addressing, however there needs to be also KA's for knowledge of the actual procedures.</p> <p>One possible solution is to modify K2 to: Knowledge of the normal, abnormal and emergency operating procedures and operational implications of or cause and effect relationships of the following as they apply the (event):</p>	

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	<p>steam generator, or steam generator tube rupture effect on Reactor Coolant System temperature.</p> <p>EK 2.02 etc.</p> <p>This lack of KA's to address the knowledge of procedures is a flaw of the new catalogue.</p>		
39	<p>: None - Lack of KA for Pressurizer (PZR) Vapor Space Accident (Relief Valve Stuck Open)</p> <p>While reviewing Abnormal Plant Evolutions section 4.2 for the AP1000 catalogue, noticed that there is not an equivalent section for APE 08: Pressurizer (PZR) Vapor Space Accident (Relief Valve Stuck Open) from the current PWR catalogue. There are many important KAs that are listed in APE 08. Many of these KA's relate to operating experience from the TMI accident.</p> <p>In comparison there is a Reactor Coolant leak section of the new AP1000 catalogue that has a single KA for leaking pressurizer safety valves</p>	<p>Incorporate the old Westinghouse abnormal for Vapor Space accident into the AP1000 catalogue as either a separate section in 4.2 or add it to the existing abnormal for reactor coolant leak.</p>	
40	<p>None - Lack of KA for Pressurizer Pressure Control System (PZR PCS) Malfunction and Pressurizer (PZR) Level Control Malfunction</p> <p>While reviewing Abnormal Plant Evolutions section 4.2 for the AP1000 catalogue noticed that there is not an equivalent section for APE 27 Pressurizer Pressure Control System (PZR PCS) Malfunction and APE 28 Pressurizer (PZR) Level Control Malfunction from the current</p>	<p>Incorporate the old Westinghouse abnormal APE 27 and 28. Recommend to consolidate them into one section.</p>	

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	<p>PWR catalogue. There are many important KAs that are listed in APE 27 and 28.</p> <p>In the AP 1000 catalogue there is a KA section in the EOP section FR-1.1 Response to High Pressurizer Level.</p> <p>This is very specific and misses many KAs that were previously required.</p>		
41	<p>Emergency Operating Procedures, Shutdown Emergency Operating Procedures, or Abnormal Operating Procedures</p> <p>A2 describes parameters and conditions that determine the effectiveness of procedure actions with respect to plant response. However when you compare all A2s to the old A2s, there is no KAs which address the knowledge of the EOP/Abnormal procedures themselves.</p> <p>The old E08 Pressurized Thermal Shock A2 was for example:</p> <p>EA2. Ability to determine and interpret the following as they apply to the (Pressurized Thermal Shock):</p> <p>EA2.1 Facility conditions and selection of appropriate procedures during abnormal and emergency operations.</p> <p>EA2.2 Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.</p>	<p>For the section of the KA catalogue that deals with Emergency Operating Procedures, Shutdown Emergency Operating Procedures, or Abnormal Operating Procedures, there needs to be specific KAs that test the knowledge of the various procedures.</p> <p>One possible solution is to modify A2 to the old style A2's in the Westinghouse KA catalogue</p>	

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	<p>The new A2 KA for PTS is: Ability to evaluate the following parameters and/or conditions as they apply to Pressurized Thermal Shock:</p> <p>EA 2.01 Reactor Coolant System cold leg temperature change in any 60 minute period</p> <p>EA2.02 Reactor Coolant System Thot and/or Tcold temperatures etc. This lack of KA's to address the knowledge of procedures is a flaw of the new catalogue. SRO exams will be required to have the A2 KA selected and therefore should directly relate to 10CFR55.43 like the old KA catalogue did.</p>		
42	<p>None NU-REG 1122 PWR KA catalogue under Generic Abnormal plant evolutions, section 4.2 has High Reactor Coolant Activity. The AP1000 catalogue does not have similar KA's, but should because the AP1000 could have this condition.</p>	<p>Determine which KA's are applicable from the PWR catalogue for High Reactor Coolant Activity and develop KA's for the AP1000 catalogue.</p>	
43	<p>None NU-REG 1122 PWR KA catalogue under Generic Abnormal plant evolutions, section 4.2 has Generator Voltage and Electric Grid Disturbances. The AP1000 catalogue does not have similar KA's, but should because the AP1000 could have this condition.</p>	<p>Determine which KA's are applicable from the PWR catalogue for Generator Voltage and Electric Grid Disturbances and develop KA's for the AP1000 catalogue.</p>	<p>This will be a site specific procedure that will be developed at a later time and will be added to the next revision to the KA catalog.</p>
44	<p>None NU-REG 1122 PWR KA catalogue under Generic Abnormal plant evolutions, section 4.2 has Plant Fire</p>	<p>Determine which KA's are applicable from the PWR catalogue for Plant Fire On Site and develop KA's for the AP1000 catalogue.</p>	

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	<p>On Site. The AP1000 catalogue does not have similar KA's, but should because the AP1000 could have this condition.</p>		
45	<p>Safety Function 7: Instrumentation does not include the Protection and Safety Monitoring System.</p> <p>Under the abnormal section of the catalogue section 4.2 A-336, there is a section for malfunction of Protection and Safety Monitoring System. There should be a system section in the safety function 7. Also the following systems of instrumentation do not have their own KA's.                      Reactor Power Control System                      Rapid Power Reduction System                      Post Accident Monitoring System                      Data Display and Monitoring System                      These systems are mentioned other places in the KA catalogue but do not have their own section in instrumentation. These may be integrated into the PSM and therefore could be part of the PSM section of the KA catalogue.</p>	<p>Determine how instrumentation systems should be addressed and create KA's for them.</p>	
46	<p>Safety Function 7: Instrumentation does not include the following systems:</p> <p>In-Core Instrumentation System                      Plant Control System                      Process Radiation Monitoring System</p> <p>These systems are important instrumentation systems that currently have no KA's identified.</p>	<p>Determine how instrumentation systems should be addressed and create KA's for them.</p>	

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47	<p>SF4 PRHR K.6, A.2                      These headers are redundant, ungrammatical, and unclear. The K6 header asks about “the following plant conditions, system malfunctions, or component malfunctions “, and the A2 header asks about “the following malfunctions or operations ‘, but only items .02 and .04 under each header are a condition, malfunction, or operation</p>	<p>Combine these headers, and reword                       Knowledge of or Ability to (a) predict the impacts of malfunctions or operations involving the following systems/components on the Passive Residual Heat Removal System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:</p>	
48	<p>SF4 RCP K.6                      K6 header asked about conditions and malfunctions, this item is a system</p>	<p>K6.01 Component Cooling Systems malfunctions.</p>	<p>Stem uses the terms 'system malfunctions'</p>
49	<p>SF4 RCS K.6, A.2                      K.6 Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the Passive Reactor Coolant System:                       A.2 Ability to (a) predict the impacts of the following malfunctions or operations on the Passive Residual Heat Removal System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations                       List of items under each header                       The K6 header asks about “the following plant conditions, system malfunctions, or component malfunctions “, and the A2 header asks about “the following</p>	<p>Reword the headers to indicate either malfunctions/operations/conditions involving the listed systems OR malfunctions/operations/conditions as listed.</p>	

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	malfunctions or operations ‘ About half of the items listed under each header are systems, rather than conditions or malfs		
50	Section 1.8 Section 1.8 description of “Conduct of Ops” generic K/A includes knowledge of temporary modification procedures as an example. Temporary modification procedure knowledge is covered under Equipment Control – Generic 2.2.5, not under Conduct of Ops.	Correct description in Section 1.8.	
51	Section 1.8 Section 1.8 description of “Equipment Control” generic K/As states fuel handling included in this area. That is not correct. There are no 2.2 Generics relating to fuel handling.	Correct the Section 1.8 description of the 2.2 Equipment Control Generics.	
52	Section 1.9 Section 1.9.1 (Page 1-3) contains a Table 1 that numbers each SF category as 3.1, 3.2, etc. This is a little confusing because the Table doesn’t stand out as a Table and blends in with the next subsection, 1.9.2. These SF section numbers serve little purpose in Table 1.	Recommend removal of the Section numbers from Table 1 (i.e., 3.1, 3.2).	
53	SF6 ECS K1 There is no mention of instrument or service air with respect to power supplies.	Propose adding K/A for Instrument / Service Air with an importance rating of at least 2.5.	
54	SF6 ECS K4.03 Although this topic must be an important design feature, this K/A appears to have no operational	Recommend deleting this KA	



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	importance.		
55	SF6 IDS A4.01 Monitoring the status of DC power systems from the control room should be an operator skill.	Propose adding the ability to monitor DC systems from the control room IR rating > 2.5.	
56	SF7 DAS K1 and K3 It would seem that the items that are listed in K1 should also appear in K3 and vice versa. However, K 1.01 (CVCS) does not appear in K3 and K 3.07 (Reactor Trip System) does not appear in K1.	Propose adding these K/As to make K1 and K3 parallel.	
57	SF7 DAS K5 The loss of power to the DAS would seem to be a significant malfunction or cause/effect; however there is no such KA.	Propose adding a K/A regarding the impact of the loss of power to the DAS with an importance rating of greater than 2.5.	
58	Same as 57		
59	SF7 IIS K3.05 and K6.05 These appear to be typos. What is meant by 'Reactor System'?	Purpose correcting these typos.	
60	SF8 CAS K1 There should be a KA for the Component Cooling Water System. If this is the system that cools the air compressors, the IR should be above 2.5. If some other system cools the air compressors then this system should be added instead with an IR above 2.5.	Add a KA under K1 for the Component Cooling Water System Suggest IR 2.7.	
61	SF8 CAS K1.15 The IR of this KA should be above 2.5. The Power-Operated Atmospheric Relief Valves are part of the Main Steam System and are air operated valves. As the normal method of decay heat removal if the condenser is not available, the knowledge of the relationship of the air system and the atmospheric	Change IR to 3.0 for this KA	

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	valves is needed knowledge.		
62	SF8 CAS K2.01 The IR of this KA should be above 2.5. The Instrument air compressor package power supply is needed knowledge.	Change IR to 3.0 for this KA.	
63	SF8 CAS K2.05 The IR of this KA should be above 2.5. The High pressure air compressor and filter package power supply is needed knowledge.	Change IR to 3.1 for this KA.	
64	SF8 CWS K2.01 The IR of this KA should be above 2.5. The Circulating water pumps power supply is needed knowledge.	Change IR to 2.8 for this KA.	
65	SF8 FHS A2 The current PWR KA catalogue has a KA for fuel handling A2.03 Mispositioned fuel element with an SRO importance rating of 4.0. A mispositioned fuel element should be a listed KA with a high importance rating.	Add mispositioned fuel element KA to the A2 section of fuel handling.	
66	SF8 FHS A3 The current PWR KA catalogue has three KAs for fuel handling A3. Travel limits, Load limits and high flux at shutdown. All of these KA's have high importance ratings.	Add individual KAs for Load limit, Travel Limits and high flux at shutdown to the A3 section of fuel handling.	
67	SF8 FHS A4 The current PWR KA catalog has two KAs for fuel handling A4. Radiation Levels and Neutron levels. Both of these KA's have high importance ratings.	Add individual KAs for Radiation Levels, and Neutron levels to the A4 section of fuel handling.	
68	Universal In order to avoid clutter in the new catalog, recommend eliminating all K/A's with a rating factor of less than 2.5.		The plan is to resample the KA catalog at the end of the first refueling outages for Southern and SCANA after that KAs with less than 2.5 could be eliminated.

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	<b>Comments</b>	<b>Potential Resolution</b>	<b>Actual Resolution</b>
69	Universal Multiple references in the proposed catalog to specific subsections of the Examiner's Standard. This could force update of the catalog when Examiner's Standard re-organized. Examples in Sections 1.3, 1.4, 1.5, 1.6, 1.11, 1.12.	Recommend delete mention of specific subsections of NUREG-1021 within KA catalog.	

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	Comments		
1	<p>AK1 and AK2 categories</p> <p>The AK1 statement from the current NUREG-1122 K/A Catalog reads as follows: “Knowledge of the <u>operational implications of the following concepts</u> as they apply to ....”[emphasis mine] By re-writing the AK1 statement in the AP1000 catalog, there is effectively no category left for operational implications of theoretical concepts—i.e. operator fundamentals.</p> <p>The new catalog essentially expands the old catalog’s AK2 statement (“Knowledge of the interrelations between ... and the following:”) into the new AK1 statement (above) and the new AK2 statement: “Knowledge of the operational implications or cause and effect relationships of the following as they apply to ....” What is left out, in comparison with the old catalog, are the (theoretical) <u>concepts</u>. Why have the concepts been excluded from the AP1000 catalog? What is the specific technical basis (i.e. difference between AP1000 and current fleet reactors) for this change?</p>	<p>NRC should explicitly acknowledge the change, and evaluate whether the exclusion of important theoretical concepts that are included in the sample space for current reactor exams is acceptable for the AP1000 <u>based on the specific technical differences</u> between the AP1000 and current fleet reactor plants. Otherwise, if it is acceptable to exclude the current AK1 category from new reactor exams on another logical basis, why do we currently include them?</p>	
2	<p>AA1</p> <p>When compared with NUREG-1122, the new AP1000 catalog AA1 statement changes an “and/or” to an exclusive “and.” This is more limiting when writing exam questions. The AA1 statement should remain as it is written in the current K/A catalog.</p>	<p>Rewrite the AA1 statement to read the same as NUREG-1122, i.e. “Ability to operate and / or monitor the following as they apply to ....”</p>	
3	<p>N/A</p> <p>In the current fleet PWR (NUREG 1122) Generic Abnormal Plant</p>	<p>NRC should explicitly acknowledge the change, and evaluate whether the exclusion of an important accident that has actually</p>	

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	<p>Evolutions, there is a topic provided for 008 Pressurizer Vapor Space Accident. This entire topic is essentially “OE” related, i.e. considering the transient that initiated the TMI-2 accident and subsequent partial core meltdown. The Vapor Space Accident topic is omitted in the draft AP1000 K/A catalog.</p>	<p>happened and caused core damage is acceptable for the AP1000 <u>based on the specific technical differences</u> between the AP1000 and current fleet reactor plants. Otherwise, if it is acceptable to exclude this topic from new reactor exams on any other basis, why do we include this topic on current fleet reactors? If the argument is made that there is no specific AOP for a Vapor Space Accident written for AP1000s, one may easily point out that most PWRs do not have specific AOPs for Vapor Space Accidents either; what is important is to ensure that the knowledge and abilities needed are trained and examined at the necessary level. If for AP1000, vapor space accidents are grouped in with other small break LOCA events (SBLOCAs), NRC must also carefully weigh the AP1000 sample plan to ensure appropriate sampling factors (e.g. weighting topics appropriately) considering the differences between current-PWR sample plans and the AP1000. NRC also needs to ensure that all appropriate K/As are then included in the other sections.</p>	
4	<p>N/A In the current fleet PWR (NUREG 1122) Generic Abnormal Plant Evolutions, there is a topic provided for 027 Pressurizer Pressure Control Malfunction and 028 Pressurizer Level Control Malfunction. Both of these topics are omitted from the draft AP1000 K/A catalog.</p>	<p>NRC should explicitly acknowledge the change, and evaluate whether the exclusion of these two topics is acceptable for the AP1000 <u>based on the specific technical differences</u> between the AP1000 and current fleet reactor plants. Otherwise, if it is acceptable to exclude this topic from new reactor exams on any other basis, why do we include this topic on current fleet reactors? For example, if the argument is made that there is no specific AOP for a Pressurizer Control Systems Malfunctions written for AP1000s, are we stating that there is no technical possibility of such a malfunction occurring? If for AP1000, pressurizer level and pressure control malfunctions are grouped with other sections, NRC must also carefully weigh the AP1000 sample plan to ensure appropriate sampling factors (e.g. weighting topics</p>	

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		appropriately) considering the differences between current-PWR sample plans and the AP1000. NRC also needs to ensure that all appropriate K/As are then included in the other sections.	
5	N/A In the current fleet PWR (NUREG 1122) Generic Abnormal Plant Evolutions, there is a topic provided for 040 Steam Line Rupture. This topic is omitted from the draft AP1000 K/A catalog.	See potential resolution in 4 above.	
6	N/A In the current fleet PWR (NUREG 1122) Generic Abnormal Plant Evolutions, there is a topic provided for 054 Loss of Main Feedwater. This topic is omitted from the draft AP1000 K/A catalog.	See potential resolution in 4 above.	
7	N/A In the current fleet PWR (NUREG 1122) Generic Abnormal Plant Evolutions, there is a topic provided for 058 Loss of DC Power. This topic is omitted from the draft AP1000 K/A catalog.	See potential resolution in 4 above.	
8	N/A In the current fleet PWR (NUREG 1122) Generic Abnormal Plant Evolutions, there is a topic provided for 067 Plant Fire on Site. This topic is omitted from the draft AP1000 K/A catalog.	See potential resolution in 4 above.	
9	N/A In the current fleet PWR (NUREG 1122) Generic Abnormal Plant Evolutions, there is a topic provided for 076 High Reactor Coolant Activity. This topic is omitted from the draft AP1000 K/A catalog.	See potential resolution in 4 above.	
10	N/A	See potential resolution in 4 above.	

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	In the current fleet PWR (NUREG 1122) Generic Abnormal Plant Evolutions, there is a topic provided for 077 Generator Voltage and Electric Grid Disturbances. This topic is omitted from the draft AP1000 K/A catalog.		
11	A-304 AK1, AK2, AK3, AA1, AA2 high-level statements: Recommend capitalizing “steam generator” in all statements such that the statement reads as follows: (AK1 as example) “Knowledge of the relationship between a Steam Generator Tube Leak and the following systems or components:”		
12	A-304 AK2.02 and AK2.04 In both draft K/As A-304 AK2.02 and A-304 AK2.04, there are two spaces after the term “SG PORV.” Need to correct this typographical error.		
13	A-304 AK 2.06 Recommend a hyphen to separate the word “overfilling” to provide parallelism with the word “underfilling.”		
14	A-304 AA 2.06 Correct typographical error “edi effluent.” Revised K/A to read as follows: “Main steam line radiation, steam generator blow down effluent radiation, and/or turbine island vent effluent radiation.”		
15	A-306 AK 1.03 Typographical error in K/A statement (extra parenthesis after the word “System”).		
16	A-306 AK 2.04 Grammatical error: need to insert commas between initial three items.		
17	A-306 topic AA 2	NRC should explicitly acknowledge the	

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	There are only four K/A statements in this topic category, and important parameters—such as Pressurizer Pressure and Steam Generator (S/G) levels and pressures—are not included as K/A statements.	change, and evaluate whether the exclusion of these parameters is acceptable for the AP1000 based on the <u>specific technical differences</u> between the AP1000 and current fleet reactor plants.	
18	A-313 AA 1.10 Typographical/format error: remove the capitalization of the last word in the K/A statement (controls) for consistency with other K/As in this topic category (e.g. A-313 AA 1.09 and A-313 AA 1.11). Rewrite K/A statement as follows: “Chemical and Volume Control System Makeup controls.”		
19	A-323 AK 3.07 Typographical/Grammatical error: recommend changing “an” to “a” in the K/A statement. Revised K/A statement would read as follows: “Ensuring a Normal Residual Heat Removal System pump is in service.”		
20	A-327 AK1.03 Typographical/grammatical content error: recommend deleting one of the two words for “Main” in the K/A statement. Revised K/A statement to read as follows: “Main and Startup Feedwater System.”		
21	A-332 AK 1.04 Typographical error? This K/A statement needs to be separated into two different K/As (and importance ratings assigned to each).	Recommend revised K/As as follows: “Reactor Coolant System,” AND separate K/A for “Digital Rod Control System.”	
22	A-332 AK 1.05 Recommend replacing the “and” in the K/A statement with an “and/or” to increase flexibility when writing exam questions on the K/A.	Revised K/A to read as follows: “Main and/or Startup Feedwater System.”	



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23	<p>A-340 AK1, AK2, AK3, and AA1 high-level statements                  Typographical error: For topic A-340, Reactor Coolant Leak, in the high-level (bolded) statements for A-340 AK1, AK2, AK3, and AA1, the word "Leak" is in a different font from the rest of the statement, and in a smaller font size.</p>		
24	<p>A-342 AK 1                  Typographical/Grammatical error: The <u>R</u>, <u>C</u>, and <u>P</u> in "Reactor Coolant Pump" are capitalized in the other "high level" (bolded) statements in this topic, but for some reason not in the AK1 "high level" (bolded) statement. Also, multiple individual K/A statements do not capitalize "Reactor Coolant Pump." (e.g. A-342 AK 2.01, AK 2.02, AK3.01, AK3.02, etc...)</p>		
25	<p>entire catalog, AK3 and AA2 statements                  The current-fleet PWR K/A catalog (NUREG 1122, rev. 2) AK3 statement ("Knowledge of the reasons for the following responses as they apply to ....") includes Technical Specification (TS) items. In most cases, to find "Knowledge of the reasons for ..." TS requirements, one looks to the TS Bases document for the answer. However, in accordance with the NRC's "SRO Clarification Guidance" document, generally speaking TS Bases knowledge is SRO-only knowledge. In accordance with ES-401, AK3 statements are NOT sampled to generate K/As for SRO written examinations, and therefore these K/A statements will never be</p>	<p>NRC explicitly evaluate the above comment. Was the "SRO Clarification Guidance" document used to exclude any TS bases information from AK3 K/As? If the AA2 category is going to be the only SRO-level K/A category sampled, recommend including TS bases knowledge items in the AA2 K/A statements. For example, the above three items could be included in the AA2 statements as follows: (1) A-311 AA 2.07 "Ability to evaluate the following parameters and/or conditions as they apply to a Rod Control System Malfunction: Reasons for Tech-Spec limits for reduction of load to 50% power if flux cannot be brought back within specified target band" [or whatever power limits apply to the AP1000 reactor], (2) A-311 AA 2.08 "Ability to evaluate the following parameters and/or conditions as they apply to a Rod Control System Malfunction: Reasons for Tech-Spec limits for T-ave," and (3) A-311 AA 2.09 "Ability</p>	

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<p>sampld using the current guidance. The draft AP1000 K/A catalog excludes any mention of TS requirements in its AK3 categories, perhaps because the authors of the draft AP1000 K/A catalog wish the catalog to meet the intent of the NRC's "SRO Clarification Guidance" document, and because they may assume that the SRO written exam for the AP1000 will also only sample the AA2 and Generic topic K/As (as does the current fleet sample plans). The point is, a lot of knowledge may have been omitted from the AP1000 catalog that should have been included either in the AK3 category (if the AK3 category is going to be sampled to give written exam items for the AP1000 SRO exam), or in the AA2 category (if the AP1000 SRO exam is going to follow the current fleet practice and only sample the A2 and G categories to give written exam items for the AP1000 SRO exam). For example, for APE 003 "Dropped Control Rod," the current fleet PWR catalog (NUREG 1122) has three example K/As that read as follows: "Knowledge of the reasons for the following responses as they apply to:" (1) AK3.05 "Tech-Spec limits for reduction of load to 50% power if flux cannot be brought back within specified target band" {SRO Importance Rating (IR) of 4.1*}, (2) AK3.07 " Tech- spec limits for T-ave" {SRO IR 3.9}, and (3) AK3.08 "Criteria for inoperable control rods" {SRO IR 4.2}. All three items are excellent SRO-level knowledge items in accordance with "SRO</p>	<p>to evaluate the following parameters and/or conditions as they apply to a Rod Control System Malfunction: Reasons for Criteria for inoperable control rods." This is an opportunity to use the "SRO Clarification Guidance" document to improve the quality of SRO-only written exams.</p>	
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	Clarification Guidance” document.		
26	Legacy KA Catalog has a first section for 2.0.1 and 2.0.2; neither of these is listed in the NEW Catalog. Will there be a TRM Manual for the AP 1000 (APK).		
27	2.1.1 Some of this grouping does not have the 43.XX CFR identifier for SRO questions. Propose to add CFR 43.10 to this line item.		
28	2.1.2 Propose to add CFR 43.1 to this line item		
29	2.1.8 Propose to add CFR 43.1 to this line item		
30	2.1.9 Propose to add CFR 43.1 to this line item		
31	2.1.10 Propose to add CFR 43.X to this line item		
32	2.1.32 Propose to add CFR 43.X to this line item		
33	2.2.8 Propose to add CFR 43.2 to this line item		
34	2.2.9 Propose to add CFR 43.1 to this line item		
35	2.4.10 Propose to add CFR 43.1 to this line item		
36	2.4.23 Propose to add CFR 43.1 to this line item		
37	2.4.27 Propose to add CFR 43.1 to this line item		

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38	No generic task list		
39	SF-3 ADS A3 Are there items that will require monitoring during ADS actuation? Is this a totally passive system, or do components have to change state? It seems with only one item in this area that it is kind of light.		
40	SF-3 PPCS K.1 Will the pressurizer pressure control system interact/effect at all with the Containment? If it does this is not listed in category K.1		
41	SF-3 PPCS K.5 Category K5 does not list using steam tables to determine conditions of the pressurizer. Does a steam bubble exist, if so this needs to be included?		
42	SF-4 RCP K2 Many of the previous power supplies are not listed. Do the RCPs have oil systems, valves etc. that could become inoperable without power, or is all of this passive?		
43	SF-4 RCP K5 What about the effects of changing pump speed on core parameters?		
44	SF-4 RCP A2 Do these RCPs have seals? If so, these are not listed.		
45	SF-4 RCS K5 Corrosion control principles and Neutron embrittlement are not listed.		

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46	SF-4 RCS A3 Did not see anything on the Reactor coolant leakage system		
47	SF-4 Normal RHR K5 Nothing listed about how operation of system will effect reactivity, boron concentration etc.		
48	SF-4 SGS Most of the K/As listed so far are greater than 2.5. This category has several less than 2.5. Why are we listing them?		
49	SF-4 MTS Generic statement - several items listed in A2 appear that they should be at least 2.5 many of which are listed at just less than 2.5 for example:  Turbine Vibrations 2.2 Turbine Over-speed 2.2 Normal control mode 2.2 C7, and C16. etc.  This is also true for many of the sections, to many to list. I understand that they may be covered in other topics or categories but it is not obvious. If the topic was greater than 2.5 in one area it should be at least 2.5 in another.		
50	SF-8 FHS Many of the K/A in the knowledge and ability areas are less than 2.5 for the ROs, some of these may need to be revisited. If ROs are moving fuel		

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	they need to know how it operates and what to do if something goes wrong.		
51	2.2.5 Knowledge of the process for making design or operating changes to the facility, such as 10 CFR 50.59 screening and evaluation processes, administrative processes for temporary modifications, disabling annunciators, or installation of temporary equipment.	It was my understanding that we were going to delete or NA all K/As < 2.5.  In addition: I have flagged all the KA that contained a KA, 2.5 up through page 3.4-45.	
52	Maybe part of 51? Look at list.		Part of 51.
53	EK1 Categories Similar to others comment on the AK1 And AK2 topics: The current NUREG 1122 uses the words “operational implications”. The proposed K/A catalog uses the words “relationship between”. I think that “operational implications and/or cause and effect” is the better terminology because it allows questions to be written on how one part of the plant affects another, but also how it may affect an operator’s actions. Similar wording as is used in the proposed EK2 lead-in statement could also be used in the EK1 lead-in statement.	Use “operational implications and cause and/or effect ...” instead of “relationship between” so that the KA can be more broadly interpreted, thus allowing a wider range of topics on which to be written.	
54	EA1 Categories Use “operate and/or monitor” to increase the number of topics on which to write questions.	Use “operate and/or monitor” to increase the number of topics on which to write questions.	
55	ES-0.2 EK 2.02 (For example – bottom of page 4.1-13) I would suggest verbally describing any setpoint values throughout the	Verbally describes setpoints for interlocks, trips, etc., so that future changes in the actual value do not invalidate the KA. This comment should be considered for incorporation	

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	entire catalog. Over time plant setpoints change due to various reasons (I.E. changes in safety analysis calcs, power uprates, etc). It would not seem like a good idea to lock these setpoints into the KA statement.	throughout the KA catalog for any specific values provided for anything.	
56	ES-0.2 EK3.15 (Page 4.1-15) Write the statement more generically so that if the limits ever change, then the KA is still valid	I.E. Cool the reactor coolant system at a rate not to exceed applicable limits and operate inside the ..... I would also suggest applying this comment generically to all KAs to which it may apply. In other words, describe limits in more generic terms and do not provide the specifics of the limit.  Another example would be SDP-5 EK2.02 (Page 4.1-87) for RCS pressure greater than 450 psig – this is why I am suggesting that the entire catalog be reviewed for specific values. It would be a much more flexible/durable catalog if the values were removed.	
57	ECA-1.1 EK2 No KAs are listed for operational implications or cause effect relationships for LOCA outside containment. I would make an educated guess and think that there would be some operational implications for identifying a LOCA outside containment and then to attempt to isolate the leak or mitigate the leak's consequences.	Suggest reviewing operator actions needed to address the LOCA outside containment and then make a determination if any of those implications would be appropriate to list in this section.	
58	SDP-4 EK2 Only one sub-topic is listed (EK 2.01: Movement of irradiated fuel near source range nuclear instrumentation detectors). I would assume that several things could potentially cause a rise in nuclear flux, such as boron dilution, control	Suggest reviewing other items that could cause a rise in nuclear flux and add appropriate sub-topics under SDP-4 EK2.	

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	rod movement, placement of a fuel assembly, change in temperatures (Nothing was in SDP-6 for op implications of temp on NIs).		
59	Page 4.1-1 FR-C.1 I think that "Response to Inadequate Core" should be "Response to Inadequate Core Cooling".		
60	Pressurizer Vapor Space LOCA does not appear to have coverage in the AP1000 K/A catalog.	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	
61	Loss of Reactor Coolant System Make-up does not appear to have coverage in the AP1000 K/A catalog.	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	
62	Pressurizer Pressure Control does not appear to have coverage in the AP1000 K/A catalog.	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	
63	Pressurizer Level Control does not appear to have coverage in the AP1000 K/A catalog	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	
64	Loss of Source Range Nuclear Instrument does not appear to have coverage in the AP1000 K/A catalog.	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	
65	Loss of Intermediate Range Nuclear Instrument does not appear to have coverage in the AP1000 K/A catalog.	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	
66	Loss of Condenser Vacuum does not appear to have coverage in the AP1000 K/A catalog.	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	
67	Loss of Main Feedwater does not appear to have coverage in the AP1000 K/A catalog.	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	



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68	Loss of DC Power does not appear to have coverage in the AP1000 K/A catalog.	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	
69	Accidental Radwaste Release does not appear to have coverage in the AP1000 K/A catalog.	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	
70	Loss of Nuclear Service Water does not appear to have coverage in the AP1000 K/A catalog.	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	
71	Plant Fire On site does not appear to have coverage in the AP1000 K/A catalog. Same as comment 8 and 44	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	
72	Loss of Containment Isolation Capability (or integrity – although this is a dated term) does not appear to have coverage in the AP1000 K/A catalog.	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	
73	High RCS Activity does not appear to have coverage in the AP1000 K/A catalog.	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	
74	Generator Voltage and Electric Grid Disturbances does not appear to have coverage in the AP1000 K/A catalog. Same as comment 43	This should be evaluated to ensure that it is not left out of the AP-1000 K/A catalog if it still has relevance to the AP-1000 design.	
	Other comments		
1	2.3.39 Suggest revising 2.3.39 to say “Knowledge of Technical Specification action statements that are identified in the licensee approved task list as memory items.”  Basis: According to the examiners and		

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	<p>licensees present at the Jan 19, 2011 meeting, this is the standard that is already being applied during actual exam development.</p> <p>All licensees are required to have a current task list as part of implementing the SAT process.</p> <p>It is unreasonable to require a licensed operator to memorize hundreds of LCO actions, but the proposal to limit that to those items requiring a plant shutdown is an arbitrary selection that cannot be tied to risk. There is no reason to believe that a required one-hour shutdown has a greater risk significance than an immediate action requirement that applies in a lower mode.</p>			
2	<p>2.2.5 This K/A should be assigned greater importance for both RO and SRO candidates. A higher importance is assigned to the controlling of configuration and status, and for knowledge of surveillances, and the tagging and clearance procedures in both NUREG 1122 and the proposed AP1000 K/A catalog. Temporary design changes can have a significant impact on plant operation equal to that of those examples given. All aspects of the AP1000 Knowledge statement 2.2.5 can have severe consequences if operators do not have significant knowledge of the licensee's processes, particularly in disabling the facilities annunciators.</p>	<p>Change the importance rating to at least 3 for ROs and 4 for SROs.</p>		
3	<p>2.3.8 This K/A states that there is no</p>	<p>RO's should be assigned an importance of at least 3 or 4 for this knowledge statement.</p>		

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	<p>assigned importance for RO applicants. NUREG 1122 contains a similar statement, or at least in part. To state that RO applicants are exempted from knowledge of at least part of this statement would be inconsistent, at least, with precedent. (NUREG 1122 K/A 2.3.14) ROs should be familiar and knowledgeable of radiation and/or contamination hazards that may arise during any operating condition IAW 10 CFR 55.41(b)(12).</p>		
4	<p>2.4.23 This Knowledge statement contains a typographical error in the reference. Lists CFR 5.11 vs. 45.11 as the last reference. (Knowledge of the facilities Emergency Plan)</p>	<p>Change the list of references to read, "(CFR: 41.10 / 43.5 / 45.11)".</p>	
5	<p>SF1 CVS A2.31 The malfunction of this type of reactivity control method at EOL should have a higher importance factor due to its implications in reactor control during malfunction could be equated to that "Expected reactivity changes after valving in a new mixed-bed demineralizer that has not been preborated" (NUREG 1122 A2.32 System 004) or that of an "Uncontrolled boration/dilution," (NUREG 1122 A2.25 system 004) which has importance factors greater than or equal to 3.4 for both RO's and SRO applicants.</p>	<p>Change the RO Importance Rating to 3.8 and SRO importance rating to 4.3.</p>	
6	<p>SF1 DRCS A2.05 A failure in the pressurizer level control system and the consequential implications on the Digital Rod Control System are</p>	<p>Change the RO and SRO importance factors to 3.7 and 3.9, respectively.</p>	

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	fundamental to a Reactor Operator's understanding of the integrated primary systems affecting reactivity control mechanisms. A stronger emphasis should be placed on this concept.		
7	SF1 DRCS A2.06 Similar to the comments on K/A SF1DRCSA2.05, both Reactor Operators, and Senior Reactor Operators need to be able to demonstrate the ability of understanding the implications that a failure of the Pressurizer Pressure Control system can have on core reactivity, and thus how that could translate to the Rod Control system.	Change the RO and SRO importance factors to 3.7 and 3.9, respectively.	
8	SF2 CVS A2.31 Similarly to the comments in for K/A SF1 CVS A2.05.	Change the RO Importance Rating to 3.8 and SRO importance rating to 4.3.	