FPL

AUG 14 1998

L-98-214

Mr. Luis A. Reyes
Regional Administrator, Region II
Attn: Thomas A. Peebles
U. S. Nuclear Regulatory Commission
Atlanta Federal Center
61 Forsyth Street, S. W., Suite 23T85
Atlanta, GA 30303

Dear Mr. Reyes:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
SRO/RO License Examination Comments

In accordance with the requirements of NUREG-1021, "Operator Licensing Examiner Standards," Examiner Standards ES-501, "Initial Post-Examination Activities," enclosed are the Florida Power and Light Co. (FPL) August 7, 1998 written RO/SRO license examinations, supporting documentation and comments.

Should there be any questions, please contact Ms. Maria Lacal at (305) 246-6476.

Very truly yours,

R. J. Hovey
Vice President
Turkey Point Plant

OIH

Enclosure

cc: T. A. Peebles, Chief, Operations Branch, Region II, USNRC (w/o enclosure)
D. C. Payne, Lead Examiner, Region II, USNRC (w/o enclosure)
Senior Resident Inspector, USNRC, Turkey Point Plant (w/o enclosure)
Document Control Desk, USNRC, Washington, D.C. (w/o enclosure)

(old number 39.) RO #46

QUESTION: 056 (1.00)

The following conditions exist on Unit 3 with the unit in Mode 2:

- A LOCA occurred and the operators responded using the EOP network.
- With containment radiation levels at 2.3E4 R/hr, the operators enter EOP-FR-Z.3, Response to High Containment Radiation Level.
- Unit 3 containment purge valves have no indication with green placards on VPB.

Containment Instrument Air Bleed Isolation valve status is as follows:

- CV-3-2819 (I.C.) is open.
- CV-3-2826 (O.C.) is closed.

The Unit 4 RCO reports the following Control Room Emergency Supply Fan status:

- SF-1B is stopped.
- The HIGH FLOW TRAIN B amber light is lit.
- SF-1A is running.

Which ONE of the following describes the correct operator actions to be taken in response to the above events per FR-Z.3?

a. Verify at least two emergency containment filter fans running.

b. Dispatch an operator to locally close CV-3-2819.

c. Direct the Unit 4 RCO to start SF-1B and stop SF-1A.

d. Verify that the fuses for containment purge valves are pulled behind VPB.

ANSWER: 056 (1.0)

a. and b. 8/12/98 8-13-98

REFERENCE:

3-EOP-FR-Z.3, "Response to Containment High Radiation Level"

690233803
Modified SRO 97 Exam Question 39
KA W/E16 EA2.2 (3.0/3.3)
10CFR55.43.5/45.13
Pg. 4.5-48
Level 2
old 39

JUSTIFICATION FOR ANSWER KEY CHANGE:

The answer "b" is being accepted due to the fact that it is technically correct and plausible.

DISCUSSION:

Distractor "b" was originally analyzed as being implausible since the valve is physically located inside containment and local manipulation of the valve is impossible with high radiation/LOCA inside containment.

However, the specific direction of EOP-FR-Z.3 (which is what the question refers to) tells the operator to locally close ANY failed open instrument air bleed valve that cannot be remotely closed (no mention of valve location or radiation field concerns is given in FR-Z.3). Locally closing CV-3-2819 is therefore specifically directed by EOP-FR-Z.3.

Our definition of "local" encompasses all actions taken outside the control room. Instrument air to containment can be locally isolated (which would fail closed the valve) without entering containment. Locally isolating instrument air to fail a valve closed is locally closing the valve. This action is plausible and directed by FR-Z.3, making distractor "b" correct.

QUESTION: 039 (1.00)

Distractor Validation

b. Plausible, because this is called for by RNO 1.c of FR-Z.3, but not correct because the valve is inside containment and the outside containment valve is closed to isolate the penetration.

c. Plausible, because SF-1B normally starts on control room recirculation, but not correct because SF-1A is satisfactory to establish control room ventilation and SF-1B is locked out by the high flow signal.

d. Plausible, because this is similar to RNO 1.b of FR-Z.3, but not correct because the green placards on the purge valves denote that the valves have been verified closed with fuses pulled.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Verify Containment And Control Room Ventilation Isolation:	
	a. Unit 3 containment purge exhaust and supply fans - OFF	a. Manually stop fans.
	b. Containment Purge Supply and Exhaust Isolation valves - CLOSED • POV-3-2600 • POV-3-2601 • POV-3-2602 • POV-3-2603	b. Manually close valve(s). IF any valve can NOT be closed, THEN behind VPB, pull fuse for any open valve(s). * XEP for POV-3-2600 * XLAG for POV-3-2601 * XEQ for POV-3-2602 * XLAH for POV-3-2603
	c. Containment Instrument Air Bleed Isolation valves - CLOSED • CV-3-2819 • CV-3-2826	c. Manually or locally close valves.
	d. Verify Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT	d. Manually align equipment for Control Room emergency recirculation.
2	Verify Emergency Containment Filter Fans - AT LEAST TWO RUNNING	Manually start filter fans.
3	Notify Plant Personnel To Monitor Radiation Levels While Performing Local Actions	
4	Notify TSC Staff Of Containment Radiation Level To Obtain Recommended Action	
5	Return To Procedure And Step In Effect	

END OF TEXT

FINAL PAGE

(old number 11)

QUESTION: 028 (1.00) RO #88

Unit 3 is in mode 3 when the following events occur:

- MOV-3-626 spuriously closes.
- Seal injection is NOT available.
- RCP #1 seal leakoff temperature is 180°F.
- The cause for MOV-3-626 spurious closure has been corrected.

Which ONE of the following describes the required operator actions to be taken in this circumstance?

a. Manually open MOV-3-626 at VPB. Leave power on MOV-3-626.

b. Manually open MOV-3-626 at VPB. Remove power to MOV-3-626.

c. Remove power to MOV-3-626 and station a watch at the breaker. Slowly open MOV-3-626 to establish a 1°F/minute cooldown rate on the RCP pump lower bearing.

d. Remove power to MOV-3-626 and station a watch at the breaker. Slowly open MOV-3-626 to establish a 5°F/minute cooldown rate on the RCP pump lower bearing.

ANSWER: 028 (1.0)

c. and a. 8/12/98 8-13-98

REFERENCE:

3-ONOP-041.1

690214005
NEW
KA 000026 AA1.06 (2.9/2.9)
pg. 4.2-18
Level 2
old 11

JUSTIFICATION FOR ANSWER KEY CHANGE:

The answer "a" is being accepted due to the existence of a plausible initiator (spurious high flow) of the spurious closure of MOV-3-626 which has specific procedural (ARP and EOP) direction to manually re-open MOV-3-626 without checking for the presence of seal injection. The ARP and EOP responses were not considered during the generation of this question.

DISCUSSION:

MOV-3-626 is a motor operated valve which is closed by the following signals:

- High thermal barrier cooling water flow
- Manual closure due to the switch
- Phase B containment isolation

The most common cause of spurious closure of MOV-3-626 is due to high thermal barrier cooling water flow. This condition can be caused by starting additional component cooling water pumps or by isolating CCW flow to a component (per 3-ARP-097.CR for high flow alarm).

Per 3-ARP-097.CR for annunciator A-1/3, RCP THERMAL BARR COOLING WATER LO FLOW (this alarm is received whenever MOV-3-626 goes closed), "IF MOV-3-626 has closed due to a spurious high flow condition, THEN open MOV-3-626." This is performed without checking for the presence of seal injection. Three steps down in the ARP, the ARP states "IF low flow condition continues THEN verify proper RCP seal injection flow rates" (AFTER re-opening of MOV-3-626 is attempted). The next ARP step then directs the operator to refer to 3-ONOP-041.1.

If this spurious high flow condition were to occur during safety injection (a situation that would meet the exact conditions of the question-mode 3, no seal injection), the guidance of 3-EOP-E-0 step 9.d.RNO would direct you to re-open MOV-3-626 despite the loss of RCP seal injection and without checking RCP seal leakoff temperatures.

A spurious phase B could cause MOV-3-626 to occur. The nature of the logic of the phase B circuit (needs high and high-high containment pressure signals or 2/2 pushbuttons) makes this failure unlikely. Phase B was not specified as the cause of the spurious failure on the exam question. A spurious phase B would, per the ARP, require use of the RCP ONOP (3-ONOP-041.1) to correct.

Any other failure of MOV-3-626 causing it to close would not allow use of the ARP guidance and require use of the ONOP (unless E-0 was in use).

The ONOP answer ("c") remains correct since the entry conditions for 3-ONOP-041.1 are met and the conditions given in the question, when applied to ONOP-041.1, will (after reading 13 substeps) result in reaching the answer listed in "c".

QUESTION: 011 (1.00)

Distractor Validation

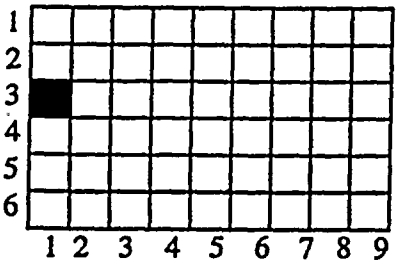
a. Plausible, because if seal injection was maintained opening MOV-3-626 from VPB is okay, but not correct because with a loss of seal injection throttling of 626 is required.

b. Plausible because if seal injection was maintained opening MOV-3-626 from VPB is okay and the correct method deenergizes 626, but not correct because with a loss of seal injection throttling of 626 is required.

d. Plausible because the overall method is correct, but not correct because the allowed cooldown rate is 1°F/minute.

WHITE	STATUS INFORMATION	A 1/3

A19



ATTACHMENT 1
Page 3 of 54
Panel A

RCP
THERMAL BARR
COOLING WATER
LO FLOW

DEVICES:

FIC-3-626

SETPOINTS:

66 GPM

OPERATOR ACTIONS:

1. Verify alarm by checking the following:
   a. Verify position of MOV-3-626 (VPB)

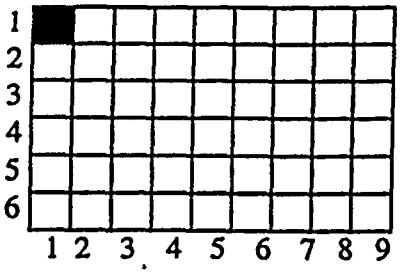
2. Corrective actions:
   a. IF MOV-3-626 has closed due to a spurious high flow condition, THEN open MOV-3-626.
   b. Dispatch an operator to verify flow on FIC-3-626.
   c. Verify proper CCW system operation.
   d IF low flow condition continues, THEN verify proper RCP seal injection flow rates.
   e. Refer to 3-ONOP-041.1, Reactor Coolant Pump Off-Normal.

CAUSES:
1. MOV-3-626 closed
2. Loss or decrease in total CCW system flow

REFERENCES:
1. FPL DWG 5613-M-3041, Sh 3, RCP Details
2. FPL DWG 5613-M-3030, CCW
3. TECH SPEC 3.4.1.1, 3.4.1.2, and 3.4.1.3

BLUE	INVESTMENT PROTECTION	A 1/1

A1



ATTACHMENT 1
Page 1 of 54
Panel A

RCP
THERMAL BARR
COOLING WATER
HI FLOW

DEVICES:

FIC-3-626

SETPOINTS:

130 GPM

OPERATOR ACTIONS:

1. Verify alarm by checking the following:
   a. MOV-3-626 is closing or is closed.
   b. PRMS R-17A or B indicating higher than normal activity.
2. Verify the following automatic actions have occurred:
   a. IF flow greater than 130 GPM, THEN verify MOV-3-626 closes.
3. Corrective actions:
   a. IF high flow alarm actuated when a component supplied by CCW was isolated or a CCW pump was started, THEN perform the following:
      (1) Open MOV-3-626.
      (2) Refer to 3-OP-041.1, Reactor Coolant Pump, to verify proper flows.
   b. IF the alarm is coincident with a RCP #1 Seal failure, THEN refer to 3-ONOP-041.1, Reactor Coolant Pump Off-Normal.
   c. IF the alarm is coincident with abnormal CCW activity, THEN perform the following:
      (1) Have Chemistry sample to confirm RCS in leakage.
      (2) Refer to 3-ONOP-041.1, Reactor Coolant Pump Off-Normal, AND 3-ONOP-067, Radioactive Effluent Release.

CAUSES:
1. RCP Thermal Barrier Leak
2. RCP #1 Seal Failure
3. Change in CCW flow due to the start of a CCW pump or the isolating of major components supplied by CCW.

REFERENCES:
1. FPL Dwg 5613-M-3041, Sh 3, RCP Details
2. FPL Dwg 5613-M-3030, CCW
3. PC/M 89-123
4. Tech Spec 3.4.1.1, 3.4.1.2, 3.4.1.3, and 3.4.6.2

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	**Verify SI Pumps Running:**	
	a. High-head SI pumps - AT LEAST TWO RUNNING	a. Manually start high-head SI pump(s) to establish two running.
	b. RHR pumps - BOTH RUNNING	b. Manually start RHR pumps.
9	**Verify Proper CCW System Operation:**	
	a. CCW Heat Exchangers - THREE IN SERVICE	a. Perform the following: 1) Start or stop CCW pumps as necessary to establish ONLY ONE RUNNING CCW PUMP. 2) Verify EMERGENCY CONTAINMENT COOLERS - ONLY TWO RUNNING 3) Go to STEP 9c.
	b. CCW pumps - ONLY TWO RUNNING	b. Start or stop CCW pumps as necessary to establish ONLY TWO RUNNING CCW PUMPS.
	c. CCW headers - TIED TOGETHER	c. IF both CCW headers are intact, THEN direct a field operator to tie the headers together
	d. RCP Thermal Barrier CCW Outlet, MOV-3-626 - OPEN	d. IF containment isolation phase B NOT actuated AND CCW radiation levels are normal, THEN manually open valve. IF MOV-3-626 can NOT be manually opened, THEN direct operator to slowly open MOV-3-626 locally.
10	**Verify Proper ICW System Operation:**	
	a. Verify intake cooling water pumps - AT LEAST TWO RUNNING	a. Start intake cooling water pump(s) to establish at least two running.
	b. Verify ICW To TPCW Heat Exchanger - ISOLATED: • POV-3-4882-CLOSED • POV-3-4883-CLOSED	b. Manually close valve(s).
	c. Check intake cooling water headers - TIED TOGETHER	c. IF both intake cooling water headers are intact, THEN direct operator to tie headers together.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Containment entries shall not be performed when there are indications of an RCP seal package failure until the reactor is shutdown and RCS pressure/temperature reduced to minimize the leakage.

NOTES

- *Foldout Pages shall be monitored throughout this procedure.*
- *A time delay exists on TR-320 from when an RCP parameter exceeds its setpoint to when the recorder provides indication and alarm. Use the RCP mimic display on ERDADS as a backup to TR-320 to monitor affected RCP parameters.*
- *RCP Motor Lower Guide Bearing High Temperature Alarm Setpoints may have been reset to a lower value than the normal 185°F. Refer to 3-ARP-097.CR, CONTROL ROOM ANNUNCIATOR RESPONSE.*

1 Monitor For Abnormal RCP Parameters

a. Verify proper seal injection flow:
- RCP 3A Thermal Barrier ΔP, PI-3-131 - GREATER THAN ZERO INCHES
- RCP 3B Thermal Barrier ΔP, PI-3-128 - GREATER THAN ZERO INCHES
- RCP 3C Thermal Barrier ΔP, PI-3-125 - GREATER THAN ZERO INCHES

a. Go to Step 4.

b. Maintain number one seal leakoff flow within limits of Figure 1.

b. OBSERVE CAUTION PRIOR TO STEP 6 and go to Step 6.

c. Verify thermal barriers intact:
- A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW alarm - OFF
- A 1/2, RCP THERMAL BARR COOLING WATER HI TEMP alarm - OFF
- A 1/3, RCP THERMAL BARR COOLING WATER LO FLOW alarm - OFF

c. OBSERVE CAUTION PRIOR TO STEP 7 and go to Step 7.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	**Direct Nuclear Plant Supervisor To Evaluate Plant Conditions** a. Check for applicability to conditions listed in 0-ADM-115, NOTIFICATION OF PLANT EVENTS b. Check for applicability to conditions listed in 0-ADM-025, LICENSEE EVENT REPORTS AND NUCLEAR PROBLEM REPORTS c. Review applicable parts of Technical Specification 3.4.1 for compliance	
3	**Continue Plant Operations** a. Continue monitoring pertinent plant parameters affecting any RCP abnormalities addressed in this procedure b. Go to appropriate plant procedure as determined by Nuclear Plant Supervisor	
4	**Establish Proper RCP Seal Injection Flow** (3) a. Check all number one seal leakoff temperatures, TR-320 - LESS THAN 170°F	(4) a. Restore seal injection flow using ATTACHMENT 1 while continuing with procedure by OBSERVING NOTE PRIOR TO STEP 5 and going to Step 5.
	b. Restore seal injection as follows: 1) Verify at least one charging pump running	
	2) Check A 6/6, SEAL WATER INJ FILTER HI ΔP alarm - IN ALARM	2) Go to Step 4.b.4.
	3) IF standby seal injection filter available for use, THEN place it in service using 3-OP-047, CVCS-CHARGING AND LETDOWN	3) Perform the following: a) Fully open HCV-3-121, Charging Flow to Regen Heat Exchanger control valve. b) Isolate in service seal injection filter using 3-OP-047, CVCS- CHARGING AND LETDOWN c) Record time of loss of seal injection: _ _ _ _ _ _ _ _ d) WHEN time since loss of seal injection equals 18 hours, THEN perform 3-GOP-103, POWER OPERATION TO HOT STANDBY, to shutdown Unit 3 and stop the affected RCP within 24 hours of time recorded in RNO Step 4.b.3.c. e) WHEN seal injection filter becomes available for use, THEN go to Step 4.a. f) Continue with Step 5.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

4 **Establish Proper RCP Seal Injection Flow (Cont'd)**

4) Locally throttle open affected RCP seal injection throttle valve to establish between 6 and 13 gpm to the affected RCP.
- 3-297A for RCP A
- 3-297B for RCP B
- 3-297C for RCP C

4) Adjust Charging Flow to Regen Heat Exchanger, HCV-3-121, to establish thermal barrier ΔP greater than zero inches of water.

NOTE

When seal injection is lost, then increases in the number one seal leakoff and lower pump guide bearing temperatures may be indicative of a loss CCW cooling to the thermal barrier.

5 **Maintain Thermal Barrier Cooling**

(5)

a. Monitor number one seal leakoff and lower pump guide bearing temperatures

b. Maintain following:

- RCP Thermal Barrier Return CCW Flow, FI-3-626 - GREATER THAN 75 GPM
- CCW to RCP Oil Coolers and Thermal Barrier temperature, TR-320 - LESS THAN 105°F

c. Go to Step 1.b

(7)

(6)

b. Perform 3-ONOP-030, COMPONENT COOLING WATER MALFUNCTION, to restore cooling to thermal barrier

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTIONS

- *MOV-3-626 may be deenergized open to provide RCP cooling as long as a watch is stationed at 3B MCC to restore electric power to the valve upon receipt of a containment phase B signal or CCW System High Radiation Alarm.*
- *Deenergizing MOV-3-626 in the open position will put Unit 3 in action requirements of Technical Specification 3.6.4.*

NOTE

Flashing of component cooling water in RCP thermal barrier during a seal package failure may provide the same indications as a thermal barrier failure.

7	**Verify Operability Of Thermal Barriers**		
(10)	a. Verify CCW radiation level readings on R-3-17A and R-3-17B are NORMAL	a. Go to Step 8.	
(11)	b. Check if RCP Seal Cooling Water Outlet, MOV-3-626 - CLOSED	b. Go to Step 7.e.	
(12)	c. Verify RCP seal injection has been maintained to all RCPs	c. Perform the following: (13) 1) Open breaker 30638. 2) Slowly open MOV-3-626 locally to maintain RCP pump lower bearing cool down rates less than 1°F per minute. 3) Station watch at 3B MCC to close breaker 30638 upon receipt of CNTMT isolation phase B or CCW system high radiation levels.	
	d. Manually open MOV-3-626 at VPB	d. Perform the following: 1) Open breaker 30638. 2) Locally open MOV-3-626. 3) Station watch at 3B MCC to close breaker 30638 upon receipt of CNTMT isolation phase B or CCW system high radiation levels.	

NRC RESOLUTION OF FACILITY POST-EXAMINATION COMMENTS

SRO Question #28: Recommendation accepted. Answer "a" is also accepted as a correct response to the question. The intent of the question was to test candidate understanding of proper restoration of cooling water to the reactor coolant pump lower bearing following loss of seal injection. Under certain conditions, as specified in the annunciator and emergency operating procedures, it is permissible and desired to immediately restore seal cooling following spurious isolation.

SRO Question #56: (RO Question #46) Recommendation accepted. Answer "b" is also accepted as a correct response to the question. The intent of the question was to test candidate understanding of functional recovery procedure actions when one of two containment isolation valves for the Instrument Air Bleed system failed to close during a loss of coolant accident (LOCA) with concurrent high radiation levels in containment. Distractor "b" was plausible because the action is procedurally directed, but considered to be incorrect because the containment was inaccessible due to the LOCA conditions and high radiation levels. However, during validation, the examiners did not recognize there are alternative methods outside containment (e.g., failing instrument air to the valve) for closing the valve.

"KNOWLEDGE AND ABILITIES CATALOG FOR NUCLEAR POWER PLANT OPERATORS: PRESSURIZED WATER REACTOR"
NUREG-1122, REVISION 1, PROBLEMS

During the course of examination development, the NRC informed the Turkey Point lead examination developer of known errors in NUREG-1122, "Knowledge and Abilities Catalog for Nuclear Power Plant Operators: Pressurized Water Reactors," Revision 1, and warned of the probable presence of other problems. Recognizing the possible impact of catalog errors on the validity of the written examination, the licensee's examination team commenced a detailed review of the catalog.

As documented in the following pages, the lead facility examination developer identified over 450 problems with NUREG-1122, Revision 1. On April 1, 1998, the findings of the lead examination developer's review were communicated to the NRC. This initiative and effort significantly contributed to the NRC issuing Revision 2 of NUREG-1122 in June, 1998.

PWR K/A CATALOG (REV. 1) PROBLEMS

MISSING K/As THAT NEED TO BE ADDED:

#	K/A	Description	RO	SRO	Justification
1	002 K6.16	Sensors and detectors	2.5	2.8	Old 002000 K6.06 (2.5/2.8)
2	006 K4.14	Cross-conn. of HPI/LPI/SIP	3.9	4.2	Old 006000 K4.06
3	006 K4.15	RHR pp test flowpath	2.4	2.6	Old 006000 K4.07
4	006 K4.16	Interlocks btwn RHR vlvs and RCS	3.2	3.5	Old 006000 K4.08
5	006 K4.17	Safety injection valve interlks	3.8	4.1	Old 006000 K4.09
6	006 K4.18	Vlvs norm isol from ctrl pwr	3.6*	3.7	Old 006000 K4.10
7	006 K4.19	Interlks to stor tk m/u vlv	3.0	3.1	Old 006000 K4.11
8	006 K4.20	Auto. closure of common drn/ fill lines to accumulator	3.2*	3.5*	Old 006000 K4.12
9	006 K4.21	Byp/blk ESF channels	4.1	4.3	Old 006000 K4.13
10	006 K4.22	Intlks btwn RCP seal flow rate & stby HPI pp	3.4*	3.7*	Old 006000 K4.14
11	006 K4.23	Demin water supply to RWST	2.3*	2.5*	Old 006000 K4.15
12	006 K4.24	Water inventory control	2.6	3.0	Old 006000 K4.16
13	006 K4.25	Concentrated boric acid supply to RWST	2.8	3.2	Old 006000 K4.17
14	006 K4.26	Parallel redundant systems	3.3	3.8	Old 006000 K4.18
15	006 K4.27	Alarm for misalign. of accum. isol. vlv.	2.9	3.4	Old 006000 K4.19
16	006 K4.28	RHR	3.2	3.5	Old 006000 K4.20
17	006 K4.29	BIT recirculation	2.5*	2.9*	Old 006000 K4.21
18	006 K4.30	Ctmt isolation	3.6	3.9	Old 006000 K4.22
19	006 K5.09	Thermodyn. of water/steam	3.3	3.6	Old 006000 K5.07
20	006 K5.10	Theory of thermal stress	2.5	2.9*	Old 006020 K5.01
21	006 K5.11	Basic heat transfer equation	2.2	2.4*	Old 006020 K5.02
22	006 K5.12	Theory of fluid flow	2.4	2.6	Old 006020 K5.03
23	006 K6.19	HPI/LPI syst. (mode change)	3.7	3.9	Old 006030 K6.01
24	013 A4.01	Oper ESFAS equip that fails to actuate	4.5	4.8	Old 013000 A4.01
25	013 A4.02	Reset of ESFAS channels	4.3	4.4	Old 013000 A4.02
26	013 A4.03	ESFAS initiation	4.5	4.7	Old 013000 A4.03
27	056 A3.10	Upper surge tank flowmeter	1.7*	1.6*	Old 056020 A3.02
28	059 K6.12	S/G controller logic for MFW reg valve	2.3*	2.5	Old 059000 K6.08
	EPEs:				
29	009 EA2.03	CCWS high-radiation alarm	3.4	3.8	Old 000009 EA2.03
30	009 EA2.04	PZR level	3.8	4.0	Old 000009 EA2.04
31	009 EA2.05	Time avail. until PZR empty	3.4*	3.9	Old 000009 EA2.05
32	009 EA2.06	Whether PZR inv. loss immin	3.8	4.3	Old 000009 EA2.06
33	009 EA2.07	CCW surge tk vent vlv indic	2.7*	3.1*	Old 000009 EA2.07
34	009 EA2.08	Letdown isol vlv pos indic	2.7*	3.1*	Old 000009 EA2.08

PWR K/A CATALOG (REV. 1) PROBLEMS

#	K/A	Description	RO	SRO	Justification
35	009 EA2.09	LP SWS activity monitor	2.8*	3.3*	Old 000009 EA2.09
36	009 EA2.10	Airborne activity	3.1	3.7	Old 000009 EA2.10
37	009 EA2.11	Ctmt temp/press/humidity	3.8	4.1	Old 000009 EA2.11
38	009 EA2.12	Chg pp ammeter	2.8	2.7	Old 000009 EA2.12
39	009 EA2.13	Chg pp flow indicator	3.4	3.6	Old 000009 EA2.13
40	009 EA2.14	Actions on violate PTS limits	3.8	4.4	Old 000009 EA2.14
41	009 EA2.15	RCP parameters	3.3	3.4	Old 000009 EA2.15
42	009 EA2.16	CCW suct press gauge	2.3*	2.4	Old 000009 EA2.16
43	009 EA2.17	Total flow meter	3.3?	3.9?	Old 000009 EA2.17
44	009 EA2.18	CCW temp RCP oil clr	2.3	2.6*	Old 000009 EA2.18
45	009 EA2.19	Ctmt air clr run indic	2.7	3.1	Old 000009 EA2.19
46	009 EA2.20	Ctmt vent damper pos indic	2.6	2.9	Old 000009 EA2.20
47	009 EA2.21	Ctmt rad trend recorder	3.4	3.9	Old 000009 EA2.21
48	009 EA2.22	Chg flow trend recorder	3.0*	3.3*	Old 000009 EA2.22
49	009 EA2.23	RCP oper parameter & limits	2.8	3.3	Old 000009 EA2.23
50	009 EA2.24	RCP temp setpoints	2.6	2.9	Old 000009 EA2.24
51	009 EA2.25	Rx trip setpoints	3.9	4.1	Old 000009 EA2.25
52	009 EA2.26	Act waste tk lvl gauges	2.1*	2.5*	Old 000009 EA2.26
53	009 EA2.27	Act waste tk trend recorder	2.1*	2.4*	Old 000009 EA2.27
54	009 EA2.28	Lk rate from RCDT lvl trend	2.8	3.1*	Old 000009 EA2.28
55	009 EA2.29	CVCS pp indic lights	3.2	3.4	Old 000009 EA2.29
56	009 EA2.30	T/S limit plt ops<4 loops	2.5*	3.5*	Old 000009 EA2.30
57	009 EA2.31	T/S limit plt ops w/idle loop	2.5*	3.5*	Old 000009 EA2.31
58	009 EA2.32	SDM	3.2*	3.6*	Old 000009 EA2.32
59	009 EA2.33	RCS water inv. bal. & T/S lim	3.3	3.8	Old 000009 EA2.33
60	009 EA2.34	Cond. to stop/thr HPI	3.6	4.2	Old 000009 EA2.34
61	009 EA2.35	Cond. stop/thr reflux boil spr	3.4*	4.1*	Old 000009 EA2.35
62	009 EA2.36	Diff. btwn overcool & LOCA	4.2	4.6	Old 000009 EA2.36
63	009 EA2.37	Existence adeq. nat'l circ.	4.2	4.5	Old 000009 EA2.37
64	009 EA2.38	Eistence of head bubble	3.9	4.3	Old 000009 EA2.38
65	009 EA2.39	Adequate core cooling	4.3	4.7	Old 000009 EA2.39
	APEs:				
66	062 AK3.01	Cond. init. auto open/closing of SWS isolation vlvs	3.2*	3.5*	Old 000062 EK3.01
67	062 AK3.02	Auto. actions within SWS from ESFAS actuation	3.6	3.9	Old 000062 EK3.02
68	062 AK3.03	Guidance in EOP for loss of SWS	4.0	4.2	Old 000062 EK3.03
69	062 AK3.04	Effect on SWS dischg flow header on loss of CCW	3.5	3.7	Old 000062 EK3.04

PWR K/A CATALOG (REV. 1) PROBLEMS

DUPLICATE K/As (SHOULD BE DELETED):

#	K/A	Description	RO	SRO	Justification
1	004 K3.02	CVCS malfunction effects on PZR LCS	3.7	4.2	Duplicate of K3.05 (3.8/4.2)
2	004 A3.13	CVCS auto ops RCS temp/pres	3.4	3.6	Duplicate of A3.05 (3.9/3.9)
3	002 A1.08	Monitor RCS average temp	3.7	3.8	Duplicate of A1.03 (3.7/3.8)
4	002 A1.09	Monitor RCS T-ave	3.7	3.8	Duplicate of A1.03 (3.7/3.8)
5	045 K6.14	Valves	1.6	1.6	Duplicate of K6.03 (1.6/1.7)
6	056 A1.02	Hotwell level alarms	1.6	1.6	Subsumed by A1.04 (1.6/1.7)
7	056 A4.17	Hotwell high-level dump valve	1.9	1.7	Subsumed by A4.03 (2.1*/2.1)
8	064 A1.08	Maint min load on EDG	3.1	3.4	Duplicate of A1.07 (use A1.08 importance numbers)
9	015 K5.01	Detector operation	2.9	3.2	Subsumed by K5.09 (in-core) and K5.10 (ex-core)
10	033 A4.04	SFPCS pumps	2.4	2.9	Duplicate of A4.01
11	033 A4.05	SFPCS valves	2.4	2.8	Duplicate of A4.02
12	033 A4.06	Support sys for fill/xfer of SFPCS water	2.4	2.9	Duplicate of A4.03
	APEs:				
13	062 AA1.03	SWS as backup to CCWS	3.6*	3.6*	Duplicate of 026 AA1.03
14	062 AA1.04	CRDM hi temp alarm sys	2.7*	2.8	Duplicate of 026 AA1.04
15	062 AA1.05	CCW surge tank	3.1	3.1	Duplicate of 026 AA1.05

PWR K/A CATALOG (REV. 1) PROBLEMS

WRONG/MISSING KA NUMBERS:

#	K/A	Description	RO	SRO	Justification
1	004 K6.02	Demineralizers and ion exchangers	2.5	2.6	Old 004010 and 004050 K6.02 had SRO importance = 2.6
2	004 K6.06	Motors	2.1	2.3	Old 004050 K6.06 was (2.1/2.3)
3	002 K4.06	Prevention of missile hazards	2.1	2.4	Old 002020 K4.02 was (2.1/2.4)
4	002 K4.08	Anchoring of components	1.9	2.1	Old 002020 K4.04 was (1.9/2.1)
5	002 K5.01	Basic heat transfer concepts	3.2	3.6	Old 002020 K5.01 was (3.2/3.6)
6	002 K5.04	Reason for plt stdy state during leak rate	3.1	3.4	Old 002020 K5.02 was (3.1/3.4)
7	002 K5.05	Reason for drn tk press rise	2.9	3.3	Old 002020 K5.03 was (2.9/3.3)
8	002 K5.07	Reactivity effects RCS boron	3.6	3.9	Old 002020 K5.04 was (3.6/3.9)
9	002 K5.13	Causes of circulation	3.5	3.9	Old 002020 K5.10 was (3.5/3.9)
10	002 K5.14	Conseq. of forced circ loss	3.8	4.2	Old 002020 K5.11 was (3.7/4.2)
11	002 K5.17	Need for monitoring in-core T/Cs during nat'l circ	3.8	4.2	Old 002020 K5.14 was (3.7/4.2)
12	006 K1.09	Conn. btwn N2 and ECCS	2.6	2.9	Old 006020 K1.02 was (2.6/2.9)
13	006 K4.05	Autostart HPI/LPI/SIP	4.3	4.4	Omitted; old 006000 K4.05 (4.3/4.4)
14	006 K4.06	Recirc of min flow thru pps	2.7	3.1	Old 006030 K4.01 was (2.7/3.1)
15	006 K4.07	Norm water supply for SIS	3.4	3.8	Old 006030 K4.02 was (3.4/3.8)
16	006 K4.08	Recirc. flowpath rx bldg sump	3.4	3.6	Old 006030 K4.03 was (3.4/3.6)
17	006 K4.09	Valve pos. on SI signal	3.9	4.2	Old 006030 K4.04 was (3.9/4.1)
18	006 K4.10	Redundant press meters	3.3	3.6	Old 006030 K4.05 was (3.3/3.6)
19	006 K5.08	Operation of parallel pumps	2.9	3.1*	Old 006050 K5.01 was (2.9/3.1)
20	006 K6.10	Valves	2.6	2.8	Old 006020 K6.02 was (2.6/2.8)
21	006 K6.11	Sensors and detectors	2.3	2.7	Old 006000 K6.11 was (2.3/2.7)
22	006 K6.13	Pumps	2.8	3.1	Old 006020 K6.01 was (2.8/3.1)
23	006 K6.14	Motors	2.4	2.5	Old 006020 K6.04 was (2.4/2.5)
24	006 K6.15	Filters	1.8	2.0	Old 006000 K6.15 was (1.8/2.0)
25	006 K6.17	HXs and condensers	2.2	2.6	Old 006020 K6.05 was (2.2/2.6)
26	006 K6.18	Subcooling margin indicators	3.6	3.9	Old 006020 K6.02 was (3.6/3.8)
27	006 A1.14	Reactor vessel level	3.6	3.9	Old 006030 A1.03 was (3.6/3.9)
28	006 A3.05	Monitor auto ops SI pumps	4.2	4.3	Old 006020 A3.01 was (4.2/4.3)
29	039 K4.06	Prevent reverse stm flow	3.3	3.6	Old 039000 K4.06 was (3.3/3.6)
30	039 K4.08	Interlocks on MSIVs/byp	3.3	3.4	Old 039000 K4.08 was (3.3/3.4)
31	039 K5.06	Purpose density compensation	2.2	2.4	Old 039000 K5.06 was (2.2/2.4)
32	045 K3.01	Remainder of plant	2.9	3.2	Old 045010 K3.01 was (2.9/3.2)
33	056 K1.16	Demin bypass vlv	1.8	1.8	Old 056020 K1.01 was (1.8/1.8)
34	056 K4.03	Restricting hotwell level range	1.7	1.7	SRO omitted; Old 056010 K4.01 was (1.7/1.7)
35	056 K4.04	Moving condt to/fr st tk/hotwl	1.7	1.8	Old 056010 K4.02 was (1.7/1.8)
36	056 K5.10	Effects of leaks	1.8	2.0	Old 056010 K5.04 was (1.8/2.0)

PWR K/A CATALOG (REV. 1) PROBLEMS

#	K/A	Description	RO	SRO	Justification
37	056 K5.17	S/G water level control	2.2*	2.3*	Old 056020 K5.01 was (2.2*/2.3*)
38	056 K6.03	Main feed pumps	2.1	2.4*	Old 056000 K6.03 was (2.1/2.4*)
39	056 K6.06	Controllers and positioners	1.5	1.6	Old 056020 K6.03 was (1.5/1.6)
40	056 K6.07	Hxs and condensers	1.6	1.7	Old 056020 K6.05 was (1.6/1.7)
41	056 K6.10	Pumps	1.6	1.7	Old 056020 K6.04 was (1.6/1.7)
42	056 A2.12	Open of htr string byp vlv	1.8	2.1*	Old 056020 A2.05 was (1.8/2.1*)
43	059 K4.02	Auto turb/RT runback	3.3	3.5	Old 059000 K4.02 was (3.3/3.5)
44	059 K4.14	Start permissives MFW pps	2.1	2.3*	Old 059000 K4.14 was (2.1/2.3*)
45	059 A3.03	Feed pp suction flow press	2.5	2.6*	Old 059000 A3.03 was (2.5/2.6*)
46	059 A4.01	MFW pp turb trip indication	3.1*	3.1*	Old 059000 A4.01 was (3.1*/3.1*)
47	059 A4.08	Feed reg vlv controller	3.0*	2.9	Old 059000 A4.08 was (3.0*/2.9)
48	061 K4.01	S/G-AFW conn.	4.1	4.2	Old 061000 K1.01 was (4.1/4.2)
49	061 K5.04	Reason for warming up turb	2.3	2.5*	Old 061000 K5.04 was (2.3/2.5*)
50	061 A3.01	AFW startup and flows	4.2	4.2	Old 061000 A3.01 was (4.2/4.2)
51	062 A2.15	Conseq. of parallel out phase	2.8	3.2	Missing, old 062000 A2.15 was (2.8/3.2)
52	062 A4.05	Remote prep of bkrs for test	2.1	2.2	Missing, old 062000 A4.05 was (2.1/2.2)
53	064 K6.01	Valves	2.4	2.4*	Old 064050 K6.01 was (2.4/2.4*)
54	064 K6.02	Sensors and detectors	2.4*	2.4*	Old 064050 K6.02 was (2.4*/2.4*)
55	064 K6.03	Controllers and positioners	2.4*	2.4*	Old 064050 K6.03 was (2.4*/2.4*)
56	064 K6.04	Pumps	2.2	2.3	Old 064050 K6.04 was (2.2/2.3)
57	064 K6.06	Breakers, relays, disconnects	2.3*	2.5*	Old 064050 K6.06 was (2.3*/2.4*)
58	064 A1.01	EDG lube oil temp/press	3.0	3.1	Old 064000 A1.01 was (3.0/3.1)
59	064 A1.07	Maint min load on EDG	3.1	3.4	Old 064050 A1.01 was (3.1/3.4)
60	064 A2.13	Conseq. of opening EDG aux feeder bus	2.6*	2.8*	Missing, old 064000 A2.13 was (2.6*/2.8*)
61	012 K1.07	SDS	3.2*	3.2*	Old 012000 K1.07 was (3.2*/3.2*)
62	012 K3.02	T/G	3.2*	3.3	Old 012000 K3.02 was (3.2*/3.3)
63	012 K3.03	SDS	3.1*	3.3	Old 012000 K3.03 was (3.1*/3.3)
64	012 K4.03	Function generator processing	2.3	2.7*	Missing, old 012000 K4.03 was (2.3/2.7*)
65	012 K4.05	Spurious trip protection	2.7	2.9	Missing, old 012000 K4.05 was (2.7/2.9)
66	012 K4.07	First-out indication	3.0	3.2*	Missing, old 012000 K4.07 was (3.0/3.2*)
67	012 K4.08	Logic matrix testing	2.8	3.3*	Missing, old 012000 K4.08 was (2.8/3.3*)
68	015 K1.07	Plant computer	2.4*	2.4	Old 015000 K1.07 was (2.4*/2.4)
69	015 K5.14	Neutron flux density	2.8	3.1	Old 015020 K5.06 was (2.8/3.1)
70	029 K3.01	Ctmt parameters	2.9	3.1	Old 029000 K3.01 was (2.9/3.1)
71	033 A4.01	SFPCS pumps	2.4	2.9	Use duplicate A4.04 importance nos.
72	033 A4.02	SFPCS valves	2.4	2.8	Use duplicate A4.05 importance nos.
73	033 A4.03	Support sys. for SFPCS water	2.4	2.9	Use duplicate A4.06 importance nos.
	APEs:				

PWR K/A CATALOG (REV. 1) PROBLEMS

#	K/A	Description	RO	SRO	Justification
74	033 AK1.01	Effect of voltage changes on performance	2.7	3.0	Old 000033 AK1.01 was (2.7/3.0)
75	076 AA2.07	When demin resin needs replacing	2.4	2.7*	Old 000076 AA2.07 was (2.4/2.7*)

PWR K/A CATALOG (REV. 1) PROBLEMS

TYPOGRAPHICAL ERRORS:

#	K/A	Description	RO	SRO	Justification
1	001 K5.49	Definitions and effects of factors affecting power defect	3.4	3.7	Improper alignment of values
2	001 K5.69	Purpose of overlap SRNI/IRNI	2.9	3.6	Improper alignment of values
3	001 K5.71	Reason for CRDM x-tie bkr	2.4	2.9	Improper alignment of values
4	004 K5.06	Concept of boron worth	3.0	3.3	Improper alignment of values
5	004 K6.20	Function of demineralizer	2.5	3.1	Improper alignment of values
6	004 K6.26	Solid plt press ctrl methods	3.8	4.1	Improper alignment of values
7	002 K1.17	Conn. btwn. RCS and MT/G	3.5	3.8	Mislabelled K1.01 (old 002020 K1.01)
8	002 K6.15	Post-accident sampling	-	-	Importance values missing
9	002 A1.12	Radioactivity venting CRDS	2.9*	3.3	Misspelling (venting vice vending)
10	006 K1.12	Accumulator vent system	2.4	2.6	Omitted period from SRO imp.
11	011 K5.08	Relative flow rate thru letdwn	2.3	2.5*	Improper alignment of values
12	013 K4.22	Reason for shut SI pp disch vl	2.9*	3.1*	Improper alignment of values
13	035 A4.06	S/G isolation on steam leak...	4.5	4.6	Omitted number; misspelling
14	045 K4.18	Use of T/G balance voltmeter	1.6	1.8	Improper alignment of values
15	056 K5.10	Effects of leaks (on plant efficiency and as personnel hazard)	1.8	2.0	Mispelled, text omitted
16	056 A4.15	Turb exh temp during S/D	1.6	1.5	Improper alignment of values
17	059 A2.05	Rupture in MFW suct or dischg line	3.1*	3.4*	Mispelled
18	059 A2.12	Fail of feedwater reg vlvs	3.1*	3.4*	Mispelled
19	059 A4.02	Null out MFW pp D/P diff	2.3*	2.4*	Mispelled, comma vice period in imp.
20	061 K4.09	Crossties btwn multi-unit sta.	3.7	3.3	Delete "s" from RO imp.
21	061 A2.09	Total loss of feedwater	-	-	No importance factors listed
22	026 A1.03	Containment sump level	3.5	3.5	Mispelled
23	062 A2.15	Conseq....mismatch in volts	2.8	3.2	Missing word
24	062 A3.04	Oper. of inverter	2.7	2.9	Improper alignment of values
25	064 A3.10	[Unknown]	-	-	Number skipped (no missing K/A)
26	015 A1.07	Changes in boron concentr.	3.3*	3.4*	Omitted period
27	015 A1.08	Changes in RCS temp.	3.3*	3.4	Omitted period
28	008 K3.02	CRDS	2.9	3.1	Renumber second K3.01 to K3.02
29	008 K3.03	RCP	4.1	4.2	Renumber K3.02 to K3.03
30	008 A3.07	Effects of recirculation	2.3*	2.2*	Delete period before SRO imp.
31	029 K1.05	...cleanup and recirculation	2.9*	3.1*	Mispelled
32	034 K2.01	All fuel handling equipment	1.5	2.0	Improper alignment of values
33	075 K4.02	Interlocks btwn CWP/dischg	2.0*	2.1*	Renumber second K4.01 to K4.02
34	075 K4.03	Interlk btwn CWP/cool twr p	1.7*	2.1*	Renumber K4.02 to K4.03

PWR K/A CATALOG (REV. 1) PROBLEMS

#	K/A	Description	RO	SRO	Justification
35	075 K4.04	Auto p/u of b/u lube oil pps	1.7*	1.9	Renumber third K4.01 to K4.04
36	075 K4.05	Oper. of cond. tube clean sys	1.5*	1.5*	Renumber second K4.02 to K4.05
37	075 K4.06	Travelling screen operation	1.6	1.8	Renumber K4.03 to K4.06
38	075 K4.07	Rel. btwn WB inlet vlv/CWP logic	1.7*	1.7*	Renumber K4.04 to K4.07
39	075 A1.03	Pump amperage	1.7	1.7	Renumber second A1.01 to A1.03
40	075 A1.04	Pump oil lvls/seal flows	1.7	1.6	Renumber second A1.02 to A1.04
41	075 A1.05	Lube oil temp/press	1.5	1.6	Renumber third A1.01 to A1.05
42	075 A1.06	CW temp	1.7	1.7	Renumber third A1.02 to A1.06
43	075 A1.07	CWP motor current/dischg pr	1.5	1.5	Renumber A1.03 to A1.07
44	075 A1.08	CW m/u pp motor current	1.6*	1.6*	Renumber A1.04 to A1.08
45	075 A1.09	Norm cond for pp oil lvl/seal	1.4	1.5	Renumber A1.05 to A1.09
46	075 A4.06	[Unknown]	-	-	Number skipped (no missing K/A)
47	075 K4.03	Securing SAS on cool wtr loss	3.1*	3.3*	Delete period before RO importance
	068 A2.03	Insuff. sampl. freq. in evap. b	2.5*	2.6*	Improper alignment of values
48	EPEs:				
	011 EA2.06	Fan slow spd/damp acc mode	3.7*	4.0*	Improper alignment of values
49	APEs:				
50	003 AA1.04	Ctrl rod drive saf rod out lim	3.4*	3.3	Periods instead of dashes for imp.
51	026 AK3.02	Auto actns within CCW from ESFAS actuation	3.6	3.9	Delete "nuclear service water" (now own category)
52	026 AK3.03	EOP actions for loss CCW	4.0	4.2	Delete "nuclear service water", improper alignment of values
53	026 AK3.04	Effect on CCW dischg flow h	3.5	3.7	Delete "nuclear service water"
54	056 AA2.16	Oper status MFW pp turb emer oil pumps	1.9*	2.1*	Delete second period from RO importance
55	057 AA2.02	Core flood tk press/lvl	3.7*	3.8*	Period omitted from K/A number
56	057 AA2.03	RPS panel alarm/trip ind	3.7	3.9	Period omitted from K/A number
57	057 AA2.08	Rx pwr digital disp/rem flux	3.4*	3.5*	Period omitted from K/A number
58	057 AA2.09	Tave/Tref recorder	3.1*	3.4*	Period omitted from K/A number
59	060 AK1.03	Theory of radiation detection	2.1	2.5*	Improper alignment of values
60	062 AA1.01	Nuclear SWS temp indic	3.1	3.1	Delete "CCW" (previously combined)
61	062 AA1.02	Loads on SWS in C/R	3.2	3.3	Change "CCW" to "SWS"
62	062 AA1.06	Ctrl of flow rates to comp cooled by SWS	2.9	2.9	Change "CCW" to "SWS"
63	062 AA1.07	Flow rates to comp/sys svc by SWS	2.9	3.0	Change "CCW" to "SWS"
64	062 AA2.01	Location of leak in SWS	2.9	3.5	Change "CCW" to "SWS"
65	062 AA2.02	Cause of poss SWS loss	2.9	3.6	Change "CCW" to "SWS"

PWR K/A CATALOG (REV. 1) PROBLEMS

#	K/A	Description	RO	SRO	Justification
66	062 AA2.03	Lineups needed to s/u SWS while bypassing portion	2.6	2.9	Change "CCW" to "SWS"
67	062 AA2.04	Norm values/upper lim of temp of SWS cooled comp	2.5	2.9*	Change "CCW" to "SWS"
68	062 AA2.05	Norm values for SWS flow rates and flow to comp	2.4*	2.5*	Change "CCW" to "SWS"
69	062 AA2.06	Length of time after SWS loss that comp may be damaged	2.8*	3.1*	Change "CCW" to "SWS"
70	065 AA1.03	Rest of sys suppl IAS when press regained	2.9	3.1	Improper alignment of values
71	065 AA2.05	When to comm plt s/d when IA press decr	3.4*	4.1	Improper alignment of values
72	068 AA1.21	Xfer ctrls from C/R to s/d pan	3.9	4.1	Improper alignment of values
73	076 AK2.06	Demineralizers and ion xchgr	2.0	2.1	Improper alignment of values
74	G2.2.29	[Unknown]	-	-	Number skipped (missing K/A)
75	G2.2.30	[Unknown]	-	-	Number skipped (missing K/A)

PWR K/A CATALOG (REV. 1) PROBLEMS

MISSING/EXTRA STARS/QUESTION MARKS:

K/A	RO	SRO	K/A	RO	SRO	K/A	RO	SRO	K/A	RO	SRO
014 K4.01	-	2.7*	014 K4.02	-	2.7*	014 K4.03	-	3.4*	014 K4.04	2.6*	2.9*
014 A2.06	-	3.0*	002 A1.12	2.9*	-	002 A3.02	-	2.8*	006 K1.05	-	2.9*
006 K1.05	-	2.9*	006 K3.01	4.1*	-	006 A1.10	-	2.7*	006 A3.07	3.6*	-
006 A4.04	3.7*	-	011 K1.05	-	3.5?	011 K4.05	-	4.1*	011 K5.02	-	2.2*
011 K5.08	-	2.5*	011 K5.09	-	2.7*	011 K5.11	-	2.8*	011 K6.01	-	3.2*
011 K6.02	-	2.5*	011 K6.06	-	2.8*	011 A2.09	-	3.5?	011 A3.02	-	2.8*
013 K3.01	4.4	-	013 K4.02	3.9	-	010 K2.03	-	3.0*	010 K2.04	-	2.9*
010 K5.02	-	3.0*	010 A1.01	-	2.9*	010 A1.02	-	2.6*	003 K1.05	-	2.4*
039 K1.05	-	2.6*	039 K1.07	-	3.4*	039 K1.08	-	2.9*	039 K3.01	-	2.6*
039 K3.03	3.2*	3.5*	039 K3.04	2.5*	2.6*	039 K5.05	-	3.1*	039 K6.01	-	2.4*
039 A1.09	-	2.7*	039 A1.10	-	3.0*	039 A2.02	-	2.7	039 A3.02	-	3.5*
039 A4.01	-	2.8*	039 A4.03	-	2.8*	041 K2.01	-	2.9*	041 K2.02	-	2.8*
041 K3.03	-	2.4*	041 K4.01	-	3.3*	041 K4.08	-	2.6*	041 K4.09	-	3.3*
041 K4.10	-	3.3*	041 K4.11	-	2.5*	041 K4.15	-	2.9*	041 K4.16	-	2.7*
041 K5.05	-	3.2*	041 K5.06	-	2.8*	041 K6.02	-	2.6*	041 A4.08	3.0*	-
045 K4.02	-	2.9*	041 K4.04	-	2.5*	041 K4.05	-	2.2*	041 K4.06	-	2.3*
045 K4.08	-	3.0*	045 K4.09	-	2.2*	045 K4.10	-	2.7*	041 K4.13	-	2.8*
045 K5.01	-	3.2*	045 K5.03	-	1.9*	045 K5.07	-	2.1*	045 K5.08	-	2.1*
045 K5.16	-	2.2*	045 K5.17	-	2.7*	045 K5.19	-	1.9*	045 K6.06	-	1.8*
045 A4.02	-	2.6*	045 A4.06	-	2.7*	045 A4.08	-	2.6*	055 K3.04	-	2.0*
055 K4.01	-	2.3*	055 K4.02	-	2.6*	056 K4.18	1.5*	-	056 K5.14	1.7*	1.7*
056 K6.03	-	2.4*	056 A4.10	1.7*	1.6*	059 K1.02	3.4*	3.4	059 K4.06	2.2*	2.4*
059 K4.17	2.5*	2.8*	059 A3.04	2.5*	-	061 K1.06	-	2.6*	061 K1.08	-	2.3*
061 K1.11	-	2.8*	061 K4.11	2.7*	2.9*	061 K4.12	3.5*	-	061 A3.05	-	2.5
007 A2.07	-	2.6*	007 A4.01	-	2.7*	007 A4.04	-	2.6	026 K5.01	-	2.9*
026 K5.02	-	2.2*	026 K6.02	-	2.4*	026 K6.05	-	2.2*	026 A2.02	-	4.4*
026 A4.02	-	2.6*	103 A2.01	-	2.6*	062 K4.08	-	2.9*	062 K4.09	-	2.9*
062 A2.04	-	3.4*	062 A2.05	-	3.3*	062 A2.07	-	3.4*	062 A2.08	-	3.0*
062 A2.09	-	3.0*	062 A2.13	2.2*	2.6*	062 A2.14	2.3*	2.9*	062 A3.02	2.4*	2.2*
062 A3.03	2.3*	-	064 A2.05	-	3.2*	064 A2.12	-	3.1*	064 A3.07	-	3.7*
064 A3.09	4.0*	-	012 K5.02	-	3.3*	012 K6.07	-	3.2*	012 K6.08	-	3.7*
012 K6.09	-	3.7*	012 A1.01	-	3.4*	012 A4.07	-	3.9*	015 K1.03	3.1*	-
015 K1.06	3.1*	3.4*	015 K5.08	-	2.3*	015 K6.07	-	2.9*	015 A1.06	-	2.9*
015 A1.07	-	3.4*	015 A2.03	-	3.5*	015 A3.05	-	2.7*	015 A4.01	-	3.6*
016 K2.01	-	2.5*	016 K3.04	2.6*	2.7*	017 K1.01	-	3.2*	017 K3.01	-	3.7*
073 K2.01	-	2.7*	073 K4.02	-	3.9*	008 K6.06	-	2.4*	008 A2.04	-	3.5*
008 A4.11	-	2.9*	029 K2.03	-	2.7*	029 K4.03	3.2*	-	029 K6.02	-	2.3*
078 K4.03	3.1*	-	086 A4.04	-	3.3*	086 A4.06	-	3.2*	071 K4.06	2.7*	-
EPEs:											
009 EK2.02	-	2.6*	009 EK2.03	-	3.3*	009 EK3.01	-	3.6*	009 EK3.02	-	3.2*
009 EK3.09	-	3.4*	009 EK3.19	-	3.9?	011 EK3.07	-	3.6*	011 EA1.08	-	2.6*
038 EK3.03	-	4.0*	038 EA1.06	-	2.5*	038 EA1.07	-	2.6*	038 EA1.20	-	3.6*
038 EA1.21	-	3.1*	038 EA1.23	-	2.5*	038 EA1.41	-	3.4*	038 EA1.42	-	3.3*

PWR K/A CATALOG (REV. 1) PROBLEMS

K/A	RO	SRO	K/A	RO	SRO	K/A	RO	SRO	K/A	RO	SRO
038 EA1.43	-	3.5*	038 EA1.45	-	4.0*	038 EA2.04	-	4.2*	055 EK2.07	2.2*	-
074 EA1.28	-	3.9*									
APEs:											
001AA1.06	-	2.9*	003AK1.05	-	2.6*	003AK1.08	-	2.5*	003AK1.12	-	2.5*
003AK2.03	-	3.2*	003AK3.04	-	4.1	003AK3.07	-	3.9*	003AK3.10	-	4.2?
003AA2.04	-	3.6*	003AA2.05	-	3.2*	008AA2.17	-	2.7*	008AA2.18	-	3.0*
008AA2.21	-	2.2*	008AA2.24	-	2.6*	015/017 AK3.05	-	3.0*	022 AK1.01	-	3.2*
022AK3.03	-	3.3*	022AA1.04	-	3.2*	024AA1.09	3.5*	-	025AA1.18	-	2.8*
025AA1.19	-	2.4*	025AA1.20	-	2.5*	026AA1.03	-	3.6*	027AA1.04	-	3.6*
027AA1.05	-	3.2*	028AK1.01	-	3.1*	028AK3.04	-	3.0*	033AA1.03	-	3.2*
036AA2.03	-	4.2*	037AK3.09	-	3.1*	037AK3.10	-	3.7*	056AA1.01	-	3.8*
056AA1.06	3.6*	-	056AA1.07	3.2*	-	056AA1.11	3.7*	-	056AA1.35	-	2.3*
056AA2.33	-	3.7?	056AA2.41	2.3*	-	057AA2.08	3.4*	3.5*	059AA2.04	-	3.5*
065AK3.06	-	2.7*	065AK3.07	-	2.5*	067AA1.02	-	2.5*	067AA1.04	-	2.7*
067AA2.01	-	2.8*	067AA2.07	-	3.1*	068AK1.01	-	2.7*	068AK2.04	-	2.4*
068AK3.14	-	3.4*	068AA2.02	-	4.2*						