

DOCUMENT TRANSMITTAL FORM 14672
FOR DOCUMENTS TRANSMITTED TO DC DESK (NRC)*

DATE: 31 AUG 1989
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DOCUMENT NUMBER	SHEET NUMBER	REVISION NUMBER	COPY NUMBER
AR 503		10	24

INSTRUCTIONS TO THE ADDRESSEE

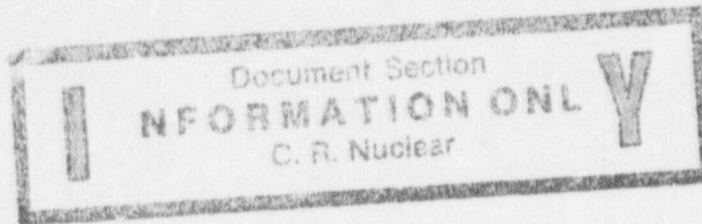
COMPLETE EACH OF THE INSTRUCTIONS BELOW WHICH ARE MARKED WITH AN " X "

- ☒ (1) VERIFY THE DOCUMENTS RECEIVED AGREE WITH THE ABOVE DESCRIPTION
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- ☐ (5) SIGN BELOW INDICATING THAT YOU HAVE READ AND UNDERSTOOD THE CHANGES AS IDENTIFIED
- ☒ (6) RETURN TO DOCUMENT CONTROL, CRYSTAL RIVER UNIT 3, MAC# NA1C____
NR2A ☒ FLA. POWER CORP., P.O. BOX 219 CRYSTAL RIVER FLA. 32629

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ANNUNCIATOR RESPONSE

AR-503

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

ICS K ANNUNCIATOR RESPONSE

THIS PROCEDURE ADDRESSES SAFETY RELATED COMPONENT

APPROVED BY: Interpretation Contact

W. Marshall

Date 8/30/89

INTERPRETATION CONTACT: Nuclear Operation
Superintendent

NNI X POWER FAILURE K-I-1	1. a) +24 VDC NNI-X Bus Failure. b) -24 VDC NNI-X Bus Failure. 2. a) NNI-X power light off on redundant instrument panel.	1. a) None. b) Trip both MFWDs. c) Refer to AP-580 (RT). d) Refer to AP-450 (EFA). e) Refer to AP-581 (LONNIX).	+23 VDC -23 VDC	
K-I-2				
TRANSMITTER POWER SUPPLY ON BACKUP K-I-3	1. a) Primary power selector switch in auto, standby power selector in standby and primary power lost. 2. a) None.	1. a) Auto transfer to standby power supply. 2. a) Notify Maintenance of transfer.		
K-I-4				
CNTRL TRANSFER TO REMOTE S/D PNL K-I-5	1. a) Anyone or more of four remote shutdown panel switches selected to "RSP". 2. a) None.	1. a) None. 2. a) Reposition switch or assume control from Remote Shutdown Panel.	49	
K-I-6				

NNI Y POWER FAILURE K-2-1	1. a) +24 VDC NNI-Y Buss Failure. b) +24 VDC NNI-Y Buss Failure. 2. a) NNI-Y power light off on redundant instrument panel.	1. a) None. b) Trip both MFVPs. 2. a) Refer to AP-580 (RT). b) Refer to AP-450 (EFA). c) Refer to AP-582 (LOWNIV)	+23 VDC -23 VDC	
ICS NNI TROUBLE K-2-2	1. a) ICS/NNI cabinets fan failure. b) +24V ICS/NNI Power Supply Failure. c) 120V ICS/NNI ABI transferred. 2. a) Power light on redundant instrument panel.	1. a) None. 2. a) Check ICS/NNI cabinet cooling fans and filter b) Open affected cabinet doors and use portable fans for cooling.		VBK-46 VBK-47
ICS/NNI FUSE BLOWN K-2-3	1. a) Any fuse blown in the ICS or NNI cabinets. 2. a) Blown fuse amber light on top row of NNI/ICS cabinet (back).	1. a) Possible partial loss of process input/output to ICS or NNI instrumentation. 2. a) Refer to OP-501 and OP-504 and determine circuit affected by the blown fuse. b) Correct cause of blown fuse and correct.		
K-2-4				
K-2-5				
K-2-6				

ICS POWER FAILURE	1. a) +24 VDC ICS Bus Failure. b) -24 VDC ICS Bus Failure. 2. a) ICS Power Light Off on Redundant Instrument Panel.	1. a) None. b) Trip both MFWDs. c) Refer to AP-580 (RT). Refer to AP-450 (EFA).	+23 VDC -23 VDC
K-3-1			
K-3-2			
K-3-3			
K-3-4			
K-3-5			
K-3-6			

WINDOW TITLE 1. INDICATED CONDITION

2. CONTROL ROOM INDICATION WHICH VERIFY OR PINPOINT TROUBLE

1. AUTO ACTION
2. OPERATOR ACTION - VALID ALARMSETPoint
ELEMENT
NUMBER &
LOCATION

LOSS OF FW PP RUNBACK K-4-1	1. a) Alarm/runback when ULD $\geq$ 55% and trip of either MFWP or MFWBP 2. a) FW pump control station indication. b) "Unit master in tracking" alarm. c) FW flow instrumentation.	1. a) Runback to 55% at 50% per minute. 2. a) Ensure that ICS properly controls unit for existing plant conditions. b) Determine cause of pump trip and restore per OP-605. c) Refer to AP-545 (PR).	55% 50%/Min	ICS MODULE 2-9-9
ASYMMETRIC ROD RUNBACK K-4-2	1. a) See note K-4-2. 2. a) Asymmetric rod indication on diamond control panel. b) Decreasing reactor power. c) "Unit master in tracking" alarm.	1. a) Unit runback to 60% at 30% per minute, if ICS is in auto control. 2. a) Ensure that ICS properly controls unit for existing plant conditions. b) Determine cause of runback/alarm. c) Refer to AP-545 (PR).	60% 30%/Min	ICS MODULE 2-9-8
REACTOR LIMITED BY FEEDWATER K-4-3	1. a) Feedwater demand is 5% greater than feedwater flow. 2. a) Feedwater flow indicators. b) "Unit master in tracking" alarm.	1. a) Unit master in track. 2. a) Ensure that ICS properly controls unit for existing plant conditions. b) Determine cause of feedwater flow error.	5%	ICS MODULE 3-6-9
UNIT LOAD LIMIT HIGH K-4-4	1. a) Unit load demand is greater than operator set maximum load limit. 2. a) "Unit Master in Tracking" alarm.	1. a) ICS controls unit load demand equal to maximum load limit. 2. a) Reduce power or increase maximum load limit, as applicable for existing unit conditions.	VARIABLE	ICS MODULE 3-5-7
UNIT LOAD LIMIT LOW K-4-5	1. a) Unit load demand is less than operator set low load limit. 2. a) "Unit Master in Tracking" alarm.	1. a) ICS controls unit load demand equal to minimum load limit. 2. a) Increase power or reduce minimum load limit, as applicable for existing unit conditions.	VARIABLE	ICS MODULE 3-5-8
K-4-6				

WINDOW TITLE

1. INDICATED CONDITION
2. CONTROL ROOM INDICATION WHICH VERIFY OR PINPOINT TROUBLE

1. AUTO ACTION
2. OPERATOR ACTION - VALID ALARM

SENSING
ELEMENT
NUMBER &
LOCATION

LOSS OF RC PP RUNBACK K-5-1	1. Alarm occurs when: a) ULD > 100% and 4 RC pumps running; b) ULD > 75% and any one RC pump tripped. 2. a) RC pump trip.	1. a) Runback at 50% per minute. 2. a) Ensure that ICS properly controls unit for existing plant conditions. b) Refer to AP-545 (PR).	100% 50%/min	ICS MODULE 2-9-11
RCS FLOW RUNBACK K-5-2	1. a) Unit load demand is too high for existing RC flow and RC flow runback is in effect. 2. a) "Unit master in tracking" alarm. b) Unit is running back to clear power/flow error.	1. a) ICS runs unit back to proper power/flow relationship. 2. a) Ensure that ICS controls proper ULD for existing RC flow conditions. b) Determine cause of power/flow error. c) Start VP-540 (RVP).		ICS MODULE 4-1-6
FW LIMITED BY REACTOR K-5-3	1. a) Alarms when neutron power is 5% greater than or 5% less than neutron demand. 2. a) Large neutron error signal. b) "Unit master in tracking" alarm.	1. a) Unit master in track. 2. a) Ensure that ICS properly controls unit for existing conditions. b) Determine cause of neutron power/neutron demand mismatch.	+5% -5%	ICS MODULE 3-7-5
REACTOR DEMAND LIMITED HIGH K-5-4	1. a) Indicates Reactor Demand is limited high at 103%. 2. a) Reactor power indication.	1. a) Reactor power limited to 103% if ICS is in AUTO. 2. a) Reduce reactor power to ≤100%.	103%	
K-5-5				
K-5-6				

RCS ΔTc HIGH K-6-1	1. a) RC inlet temperature loop A and B difference > 5°F. 2. a) Loop IC instrument indication. b) OTSG level, flows and temps not normal. c) Plant in a transient condition.	1. a) None. (ICS uses ΔTc signal for loop FW control). 2. a) Check ICS ΔTc load ratio station setting. b) Manually adjust FW flow if ICS isn't auto controlling ΔTc. c) Have maintenance check instrumentation if malfunctioning.	5°F ΔTc	RC-8-DTC
UNIT MASTER IN TRACK K-6-2	1. a) Both loop A & B FW demand station in HAND. b) STM Gen/RX master station in HAND. c) Reactor demand or diamond control stations in HAND. d) Turb gen. EHC system not in ICS auto. e) Both turb generator breakers tripped. f) Unit under cross limits. g) Reactor trip. h) Low load limit in effect. i) Unit load demand > runback or maximum load limit. 2. a) ICS control panel instrumentation.	1. a) ICS tracks generated megawatts except when tracking is due to only low load limit in effect or ULD > runback or Max load limit at which time the ICS follows the runback or load limit imposed. 2. a) Ensure that the ICS controls proper ULD for existing unit conditions.		ICS MODULE 2-8-13
K-6-3				
K-6-4				
K-6-5				
ATMOSPHERIC DUMP VALVE NOT FULL CLOSED K-6-6	1. a) Turbine bypass valves to atmosphere not full closed (MSV-25, MSV-26). 2. a) Abnormal steam pressure indication.	1. a) None. 2. a) Close, if improper position at existing plant conditions. b) Close isolation valves if unable to close.		MSV-25-K MSV-26-K

WINDOW TITLE

1. INDICATED CONDITION
2. CONTROL ROOM INDICATION WHICH VERIFY OR PINPOINT TROUBLE

1. AUTO ACTION
2. OPERATOR ACTION - VALID ALARM

SENSING
ELEMENT
NUMBER &
LOCATION

SETPOINT

STEAM GEN A LEVEL LOW-LOW K-7-1	1. a) OTSG A level less than 12" H₂O. 2. a) Low level indication on OTSG.	1. a) None. 2. a) Take manual control of ICS and increase level above 10 to level alarm.	12" H ₂ O	SP-1A-LS2 NWI-CAB
STEAM GEN A LEVEL K-7-2	1. a) OTSG A level $\geq$ 93.5% on operate range. b) OTSG A level $\geq$ 24 in on start up range. 2. a) OTSG level recorders/indicators on console. b) FW flow not matched to plant conditions.	1. a) None. 2. a) Determine cause and restore level. b) If uncontrolled high level: 1. Trip MFP and/or close MFW block, SU, and low load control valves. 2. If required, close crossover, FWV-28, and SU and low load control valves. 3. If necessary, close EFV bypass vlv's and/or trip EFV's.	93.5% 24 in.	SP-1A-LS1 SP-1A-LS2
STEAM GEN A BTU CONDITION K-7-3	1. a) Alarms when loop A feedwater demand is greater than the BTU limit calculated by the ICS. 2. Monitor instrumentation for possible: a) OTSG outlet pressure high. b) FW temperature low. c) RC Th temperature low. d) RC flow low. e) High unit load demand.	1. a) None. 2. a) Compare process parameters and unit load demand and determine cause of alarm/limit. b) Reduce demand and/or correct process variable causing alarm/limit.		ICS MODULE 3-7-3
STEAM GEN A LOW LEVEL LIMITED K-7-4	1. a) Indicates that loop A, FW demand is on OTSG low level limit control. 2. a) Decreasing FW flow. b) Decreasing OTSG A startup level (not necessarily at 30").	1. a) Feedwater control switches from FW flow error control to OTSG level control to maintain 30" in the OTSG. 2. a) Ensure that ICS controls OTSG level $\geq$ 30" on startup level instrument.	30"	ICS MODULE 3-7-5
VERIFY FWV-30 ON AUTO K-7-5	1. a) FWV-30 is opening. 2. a) Position indication for FWV-30.	1. a) FWV-30 is opening and FW Pump A shifts to demand signal. 2. a) Verify proper FW control change from valve dp to pump speed.		
TURB BYP VLV AIR FAILURE K-7-6	1. a) Indicates low air pressure on MSV-9, 10, 11, 14 at 60 psig. 2. a) Low instrument air pressure alarm. b) High or low turbine header pressure indication. c) Valve(s) will not respond to control station signal.	1. a) None. 2. a) Determine cause. b) Notify instrument shop.	60 psig	MSV-9, 10, 11, 14-PS

WINDOW TITLE	1. INDICATED CONDITION 2. CONTROL ROOM INDICATION WHICH VERIFY OR PINPOINT TROUBLE	1. AUTO ACTION 2. OPERATOR ACTION - VALID ALARM	SETPOINT	SENSING ELEMENT NUMBER & LOCATION
STEAM GEN B LEVEL LOW-LOW K-8-1	1. a) OTSG B level less than 12" H ₂ O. 2. a) Low level indication on OTSG.	1. a) None. 2. a) Take manual control of ICS and increase level above Lo Lo level alarm.	12" H ₂ O	SP-1B-LS2 NNI CAB
STEAM GEN B LEVEL HIGH/LOW K-8-2	1. a) OTSG B level $\geq$ 93.5% on operating range. b) OTSG B level $\geq$ 24 in on startup range. 2. a) OTSG level recorded/indicators on console. b) FW flow not matched to plant conditions.	1. a) None. 2. a) Determine cause and restore level. b) If uncontrolled high level: 1. Trip MFP and/or close MFW block, SU, and low load control valves. 2. If required, close crossover, FW-28, and SU and low load control valves. 3. If necessary, close EFW bypass vlv's and/or trip EFP's.	93.5% 24 in	SP-1B-LS1 SP-1B-LS2
STEAM GEN B BTU CONDITION K-8-3	1. a) Alarms when loop B feedwater demand is greater than the BTU limit calculated by the ICS. 2. Monitor instrumentation for possible: a) OTSG outlet pressure high. b) FW temperature low. c) RC Th temperature low. d) RC flow low. e) High unit load demand.	1. a) None. 2. a) Compare process parameters and unit load demand and determine cause of alarm/limit. b) Reduce demand and/or correct process variable causing alarm/limit.		ICS MODULE 3-7-4
STEAM GEN B LOW LEVEL LIMITED K-8-4	1. a) Indicates that loop B, FW demand is on OTSG low level limit control. 2. a) Decreasing FW flow. b) Decreasing OTSG A startup level (not necessarily at 30").	1. a) Feedwater control switches from FW flow error control to OTSG level control to maintain 30" in the OTSG. 2. a) Ensure that ICS controls OTSG level $\geq$ 30" on startup level instrument.	30"	ICS MODULE 3-7-6
VERIFY FW-29 ON AUTO K-8-5	1. a) FW-29 is opening. 2. a) Position indication for FW-29.	1. a) FW-29 is opening and FW Pump B shifts to demand signal. 2. a) Verify proper FW control change from valve dp to pump speed.		
FW CONTROL VLV AIR FAILURE K-8-6	1. a) Indicates low air pressure on FW-37 and/or FW-38 at $<$ 29 psig. b) Indicates low air press on FW-39 and/or FW-40 at $<$ 80 psig (PSI) or $<$ 28 psig (PS2). 2. a) Instrument air pressure low alarm. b) Yellow light backlite on air fail reset switch.	1. a) Affected valve locks at last position. b) Affected valve control station transfers to "Hand." 2. a) Investigate cause of low air pressure and restore. b) Depress "air fail reset" until alarm clears.	29 psig 80 psig 28 psig	AUX RELAY 20X

ANNUNCIATOR

PANEL
LOCATION

NOTES

- K-4-2 An asymmetric rod runback alarm will occur under the following conditions:
- a) Asym rod fault + Gp 6 in-limit + Gp 5 > 80% WD + Rx pwr > 60%.
 - b) Asym rod fault + Gp 7 in-limit + Gp 6 > 80% WD + Rx pwr > 60%.
 - c) Asym rod fault + any safety rod group NOT at out-limit + Rx pwr > 60%.
 - d) Asym rod fault + Gp 5 in-limit + Rx pwr > 60%.
 - e) Safety rod group NOT at out-limit + Gp 5 in-limit + Rx pwr > 60%.
 - f) Any safety rod group at in-limit + Rx pwr > 60%.

(LAST PAGE)