Form 34731 (R5-88)

Duke Power Company
PROCEDURE PROCESS RECORD

(1) ID No. OP/1/A/1102/04
Change(s) 45 to 47 Incorporated

PREPARATION

(2) Station Oconee Nuclear Station

(3) Procedure Title Operation at Power

(4) Prepared By Michael H. Austin Date 2-8-89

(5) Reviewed By Ronnie Lingle Date 2-9-89

Cross-Disciplinary Review By N/R R. Lingle

(6) Temporary Approval *(if necessary)*

By (SRO) Date

By Date

(7) Approved By R L Sweigart Date 2/10/89

(8) Miscellaneous

Reviewed/Approved By Date

Reviewed/Approved By Date

(9) Comments (For procedure reissue indicate whether additional changes, other than previously approved changes, are included. Attach additional pages, if necessary.)
Additional Changes Included. ☒ Yes ☐ No

(10) Compared with Control Copy Date

(11) Requires change to FSAR not identified in 10CFR50.59 evaluation? ☐ Yes
If "yes", attach detailed explanation. ☒ No

Completion

(12) Date(s) Performed

(13) Procedure Completion Verification

☐ Yes ☐ N/A Check lists and/or blanks properly initialed, signed, dated or filled in N/A or N/R, as appropriate?

☐ Yes ☐ N/A Listed enclosures attached?

☐ Yes ☐ N/A Data sheets attached, completed, dated and signed?

☐ Yes ☐ N/A Charts, graphs, etc. attached and properly dated, identified and marked?

☐ Yes ☐ N/A Procedure requirements met?

Verified By Date

(14) Procedure Completion Approved Date

(15) Remarks *(attach additional pages, if necessary)*

Control Copy Checked_____ OP/1/A/1102/04

Date/Time_____

DUKE POWER COMPANY

OCONEE NUCLEAR STATION

OPERATION AT POWER

1.0 Purpose

To describe the operation of the unit at power. This will include the following:

- Operations required to escalate power from 15% to 100% FP.
- Operations required to reduce power from 100% to 15% FP.
- Maneuvering restrictions placed on power ramp rates and Control Rod Withdrawal/APSR movement rates.
- Special instructions for operation with less than four RC Pumps.

2.0 Limits and Precautions

2.1 The plant must be operated within the limits of Technical Specifications at all times. When a limiting condition for operation, Section 3.0 of the Technical Specification is not met, the shutdown rate will be determined by Operations such that the required condition is achieved in a controlled manner within the time specified. If conditions indicate, a faster shutdown rate should be used up to and including a Reactor Trip. (Reference OMP 1-4, Actions To Be Taken In The Case of Exceeding Limits)

2.2 Maintain Power Imbalance per PT/1/A/600/01 (Periodic Instrument Surveillance).

2.3 In the event of a unscheduled power reduction, the power level shall not be increased until an investigation has been conducted and any necessary corrective action taken.

2.4 Maintain rod positions within a group at the same level to minimize power tilts.

2.5 ΔT across the condensers shall not exceed 28°F when the inlet temperature is $\leq$ 68°F. ΔT shall not exceed 22°F when the inlet temperature is > 68°F. The cooling water effluent temperature at the discharge shall not exceed 100°F for a period of time in excess of 2 hours.

2.6 Condenser effluent temperature shall not decrease more than 6°F per hour during the Winter and 10°F per hour during the Spring, Summer, and Fall.

2.7 If any two of the four power range NI's exceed 2% in the non-conservative direction, calibration is required to prevent exceeding safety limits. For planned power changes > 5% FP or planned control rod changes in excess of 15% Rod Index, the NI calibration should be checked prior to initiating the power change or control rod movement and 15 minutes after reaching steady conditions. In no case, should $\geq$ 4% in the non-conservative direction be exceeded.

2.8 If any two of the four NI's become $\geq$ 2% non-conservative during power level increases, stop the power increase and have all NI's recalibrated. Non-conservative is Thermal Power Best > NI's.

2.9 Ensure that the Pressurizer Heaters are in AUTO during any system transients or prior to initiating any system transient.

2.10 Ensure 1RC-1 (Spray Control) is in AUTOMATIC and 1RC-3 (Spray Control Outlet Block) is open during system transients or prior to initiating any plant transient. Anytime 1RC-1 is not in AUTOMATIC and 1RC-3 is throttled, ensure a Removal of Station Equipment Form is completed per OP/0/A/1102/06 (Removal and Restoration of Station Equipment).

NOTE (2.11): If difficulty is experienced in maintaining the transmission voltage within these guidelines, notify the Dispatcher.

2.11 Maintain the following voltage guidelines:

Minimum	Maximum
228	232 in 230 KV switchyard
515	525 in 525 KV switchyard

2.12 When reactor is > 15% FP and Pressurizer level decreases to 200 inches, take immediate manual action to return Pressurizer level to normal. The Pressurizer high level will be limited to the High Level Alarm Point of 260 inches.

2.13 Maintain Primary and Secondary Chemistry limits as established by the Chemistry Manual. If any (Purification or Deborating) is declared exhausted by either the Unit Coordinator or Site Chemist, de-energize the applicable inlet valves and issue the appropriate out of service stickers and R&R sheets.

2.14 Long term operation of the Condensate System should be with 100% Condensate Polishing even if this requires a load reduction or operation of three Hotwell Pumps. For short intervals such as transients, Powdex Precoating, etc., operation at less than 100% Powdex flow is acceptable. Operation in this mode should not extend beyond the time required to return the plant to normal.

2.15 Both Moisture Separator Reheater Drain Tanks are to be continuously dumped to the Hotwell to prevent Steam Generator Tube fouling.

2.16 When the body of a controlling procedure refers to another procedure or a section of another procedure, that procedure or section must be completed, reviewed by Unit Supervisor and signed as complete by Unit Supervisor prior to proceeding with the controlling procedure. This will be documented by the Supervisor signing that step in the controlling procedure.

2.17 Before performing any operation which could cause a power swing, i.e., removing/restoring FDW htrs. to and from service, reduce Reactor power ~ 4% below the power allowable for the present plant conditions.

2.18 Individual coolers of the Second Cooler Group on the Main Transformer shall be operated as needed to keep the oil temperature from exceeding 75°C. When the Main Transformer is energized and its oil temp is < 50°C, only one Main Transformer Cooler Group (9 pumps/fans) should be operated.

3.0 Enclosures

3.1 Maneuvering Restrictions for Oconee 1

3.2 Special Instructions for < 4 RC Pump Operation

3.3 Power Escalation (15% to 100% FP)

3.4 Power Reduction (100% to 15% FP)

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ENCLOSURE 3.1

MANEUVERING RESTRICTIONS FOR OCONEE 1

(Special restrictions for initial startup following a Refueling Outage would be included in the Power Escalation Procedure.)

1.0 Allowable Power Ramp Rates

1.1 0% FP to 20% FP:

Rate of Power Level Increase < 30% FP/hour.

1.2 20% FP to 50% FP, or from 20% FP to Conditioned Power Level (CPL) if the CPL is between 20% FP and 50% FP:

Rate of Power Level Increase < 20% FP/hour.

1.3 50% FP to 90% FP, or from 50% FP to CPL if the CPL is between 50% FP and 90% FP:

Rate of Power Level Increase < 15% FP/hour.

1.4 Above CPL or 90% FP, whichever is lower:

Rate of Power Level Increase < 3% FP/hour.

1.5 One control rod misaligned greater than 9 inches for more than 12 EFPH but less than 14 EFPD at a power level between 0-100% F.P:

1.5.1 Reduce Reactor Power to < 60% of the allowable power for the Reactor Coolant Pump combination.

NOTE: (1.5.2) Movement of other control rods should be minimized during withdrawal.

1.5.2 Recover rod while maintaining power level throughout withdrawal.

1.5.3 Escalate power at $\leq$ 3% FP/hr after realignment.

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ENCLOSURE 3.1
MANEUVERING RESTRICTIONS FOR OCONEE 1

1.6 One rod misaligned greater than 9 inches for more than 14 EFPD at a power level between 0-100% F.P:

Contact Performance Reactor Engineer for Rod Recovery Guidelines.

2.0 Allowable Rod Rate Limits

2.1 Rate of Control Rod withdrawal < 20% wd/hour at ≥ 25% F.P. No Control Rod withdrawal rate restriction below 25% F.P.

2.2 Rate of ΔPSR movement:

2.2.1 No limits when the Reactor is ≤ 75% F.P.

2.2.2 <10%/hour when the Reactor is 75% F.P.

3.0 Definitions:

3.1 Conditioned Power Level (CPL): The maximum core power level which has been continuously maintained for at least 72 hours within the previous 14 day period. Downtime (subcriticality) is not to be included in the 14 day period. At the start of each new cycle, the CPL is 20% FP.

NOTE: The core power increase should be as linear as possible.
(3.2)

3.2 Ramp Rate: The core power increase "time averaged" over a maximum period of 1 hour.

3.3 APSR Movement: The ± % movement from the initial starting position in a 1 hour period. (Example: For a limit of 10%/hr APSR movement with an initial starting position of 32%, the APSR could be inserted to 22% and withdrawn to 42% within a 1 hour period).

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OP/1/A/1102/04

ENCLOSURE 3.2

SPECIAL INSTRUCTIONS FOR <4 RC PUMP OPERATION

1.0 Procedure

1.1 Do not exceed 5.7 x 10^6 #/hr feedwater flow to the SG with two RC pumps.

1.2 Calibrate NI's to Thermal Power Best.

1.3 Follow PT/1/A/600/01 (Periodic Inst. Surv) limits on control rod position and Power Imbalance. The 100% Power Imbalance curves apply for extended run at reduced power. This is to meet assumptions used for FSAR accident safety analyses. Have the Performance Group generate specific curves for two RC pump combinations if necessary.

1.4 Issue work request to I&E to have the high Ø RPS trip setpoint set at 79%.

1.5 Perform the following:

1) Adjust the ICS high Ø limiter to 75%. This provides control protection to minimize a trip on Ø/Flow/Imb or high Ø in the event of an operating transient.

2) When the ICS high Ø limiter is reduced, adjust the associated alarm setpoint. (The alarm setpoint is adjusted on the power range recorder).

3) Note on Shift Turnover Sheet (OP/0/A/1102/20) anytime the ICS high Ø limiter is reduced.

1.6 Keep Auxiliary Steam available to the FDW Turbines. "D" bleed pressure may not be high enough to run the Turbines.

OP/1/A/1102/04
ENCLOSURE 3.2
SPECIAL INSTRUCTIONS FOR <4 RC PUMP OPERATION

1.7 When performing Turbine Valve movement tests, reduce load as necessary (approximately 6%) to prevent exceeding 100% flow (5.4×10^6 #/hr) out of the SG with two RC pumps.

1.8 Secure the "E" Heater Drain Pumps at < 90% F.P. Pump suction may be lost at lower loads and cause cavitation damage.

1.9 Be aware the Quandrant Power Tilt is affected by ΔTc changes. Some adjustment of Steam Generator Load Ratio (ΔTC) Controller setpoint may be required to minimize Quandrant Tilt.

1.10 If 1SSH-9 (SSH Disch. CTRL Bypass) is being used to maintain Steam Seal Header pressure, throttle the valve during the load reduction to secure an RC Pump.

NOTE: (1.11) RCS pressure decrease in the loop with two RC pumps is expected.

1.11 RCS pressure decreases in the loop with two RC pumps causing acceptance criteria of PT/1/A/600/01 (Periodic Inst. Surv.) to be out of specs. Note this on PT/1/A/600/01 (Periodic Inst. Surv.). Be aware of the affect of the indicated pressure on the margin to trip setpoint for the Reactor Protective System on the following:

1) Pressure/Temperature Trip

2) Low Pressure Trip

3) High Pressure Trip

Control Copy Checked _____

Date/Time _____

OP/1/A/1102/04

ENCLOSURE 3.3

POWER ESCALATION (15% to 100% FP)

	Date Init./Time	Verify Date Init./Time

1.0 Initial Conditions

1.1 OP/1/A/1102/01 (Controlling Procedure for Unit Startup), or OP/1/A/1102/02 (Trip Recovery) completed.

NOTE: (1.2) Steam Generator Load Ratio (ΔTc) Controller may or may not be in AUTO.

1.2 ICS in the integrated mode. _____

1.3 The Unit Load Demand Master has been set for a MAXIMUM, MINIMUM and RATE. _____

1.4 Limits and Precautions have been reviewed. _____

2.0 Procedure

2.1 Notify the dispatcher and increase Load Demand Set, as desired by depressing LOAD DEMAND SET INCREASE Pushbutton.

2.2.1 Limit rate of reactor power increase as per Enclosure 3.1 (Maneuvering Restrictions for Oconee 1)

2.2 Place Power Range Recorder in HIGH RANGE @ ~ 20% Rx. Power. _____

2.3 Set the HIGH Alarm on the Power Range Recorder at 2-5% above operating power. _____

OP/1/A/1102/04
ENCLOSURE 3.3
POWER ESCALATION (15% to 100% FP)

	Date Init./Time	Verify Date Init./Time

NOTE (2.4): Steam Generator Load Ratio (ΔTc) Controller should not be placed in AUTO when a Steam Generator is on level control.

2.4 If the Steam Generator Load Ratio (ΔTc) Controller is in HAND, place the Steam Generator Load Ratio (ΔTc) Controller Setpoint equal to Unit dTc. _____

2.5 When both Steam Generators have cleared level control:

2.5.1 Place the Steam Generator Load Ratio (ΔTc) Controller in AUTOMATIC. _____

2.5.2 Adjust Steam Generator Load Ratio (ΔTc) Controller setpoint to 0. _____

2.5.3 Verify Unit dTc gauge is at 0°F. _____

CAUTION (2.6): If any CRD Groups are in the restricted region, action must be taken to position the rods within required limits. Operation in the restricted region is limited to 2 Hours.

NOTE (2.6): Power may be increased with rods in the restricted region while corrective action is being taken.

2.6 Maintain CRD Groups 5-8 within the required position limits during power operation per PT/1/A/600/01 (Periodic Inst. Surv.).

2.7 Maintain Core Power Imbalance and Quadrant Power Tilt per PT/1/A/600/01 (Periodic Instrument Surveillance).

OP/1/A/1102/04
ENCLOSURE 3.3
POWER ESCALATION (15% to 100% FP)

	Date Init./Time	Verify Date Init./Time
2.8 At 190 MWe close the following Shell Drain valves on Moisture Separator Reheaters and HP Heater Vent Orifice Bypasses:		
1HD-405 (1A1 FSRH SHELL DRAIN).	_____	
1HD-406 (1A2 FSRH SHELL DRAIN).	_____	
1HD-407 (1B2 FSRH SHELL DRAIN).	_____	
1HD-408 (1B1 FSRH SHELL DRAIN).	_____	
1HV-5 ("1A1" Heater Vent Orifice Bypass).	_____	
1HV-47 ("1B2" Heater Vent Orifice Bypass).	_____	
1HV-12 ("1B1" Heater Vent Orifice Bypass).	_____	
2.9 At 200 MWe transfer auxiliaries from CT1 to 1T per OP/1/A/1107/02 (Normal Power).	_____	
Unit Supervisor _____		
2.10 At ~ 30% Reactor Power, maintain steady state conditions for NI calibration check.	_____	_____
2.10.1 IF any two of the four NI's are non-conservative, have I&E calibrate all NI's 3 to 5% conservative and resume power increase after calibration.	_____	_____
2.10.2 IF any two of the four NI's become $\geq$ 2% non-conservative during the power level increase, stop the power increase, and have all NI's recalibrated 3 to 5% conservative.	_____	_____

OP/1/A/1102/04
ENCLOSURE 3.3
POWER ESCALATION (15% to 100% FP)

	Date Init./Time	Verify Date Init./Time
2.11 At ~ 300 MWe, start "D" Heater Drain Pumps per OP/1/A/1106/02 (Condensate and Feedwater System).	_____	
Unit Supervisor _____		
CAUTION: (2.12) Never depress the upper toggle switch, lower toggle switch is always used to reset Contact Buffers.		
2.12 At ~ 40% power, verify the Main Turbine Trip Contact Buffers are reset on all four RPS Channels:		
A RPS Channel	_____	_____
B RPS Channel	_____	_____
C RPS Channel	_____	_____
D RPS Channel	_____	_____
2.13 Start the second HWP, CBP and FDW pump per OP/1/A/1106/02 (Condensate and Feedwater System).	_____	
Unit Supervisor _____		
CAUTION: (2.14) Never depress the upper toggle switch, lower toggle switch is always used to reset Contact Buffers.		
2.14 Reset the Contact Buffer on the Main Feedwater Pump which was just started on each of the four RPS Channels:		
A RPS Channel	_____	_____
B RPS Channel	_____	_____
C RPS Channel	_____	_____
D RPS Channel	_____	_____

OP/1/A/1102/04
ENCLOSURE 3.3
POWER ESCALATION (15% to 100% FP)

	Date Init./Time	Verify Date Init./Time
2.15 Reset the "Output Memory" on the "Main Turbine Trip Bypass Bistable" on each of the four RPS Channels:		
A RPS Channel	_____	_____
B RPS Channel	_____	_____
C RPS Channel	_____	_____
D RPS Channel	_____	_____
2.16 Reset the "Output Memory" on the "Main Feedpump Trip Bypass Bistable" for each Main Feedpump on each of the four RPS Channels:		
A RPS Channel	_____	_____
B RPS Channel	_____	_____
C RPS Channel	_____	_____
D RPS Channel	_____	_____
2.17 After each Main FDWP is operating with suction flow > 2300 gpm, place the following valves in AUTO:		
1FDW-53 ('A' FDWP Min. Flow Recirc. Control Valve)	_____	_____
1FDW-65 ('B' FDWP Min. Flow Recirc. Control Valve)	_____	_____
2.18 Start additional CCW pumps as required per OP/1/A/1104/12 (Condenser Circulating Water System).	_____	

Unit Supervisor _____

OP/1/A/1102/04
ENCLOSURE 3.3
POWER ESCALATION (15% to 100% FP)

	Date Init./Time	Verify Date Init./Time
2.19 When the load reaches 500 MWe, raise Machine Gas pressure to 60 psig per OP/0/A/1106/17 (Hydrogen System).	_____	
Unit Supervisor _____		
2.20 Prior to exceeding 60% Reactor Power, verify three HPI pumps and two HPI flow paths are operable.	_____	
Unit Supervisor _____		
NOTE: (2.21) This should occur when Reactor Power is between 65% and 85%.		
2.21 When air loading pressure (as indicated on their controllers) to 1MS-112 and 1MS-173 (SSRHs Controls) is 30 psig and they are in AUTO, verify the following SSRH Steam Supply valves are in AUTO and OPEN:		
1MS-77 (MS To 1A1 SSRH).	_____	
1MS-78 (MS To 1A2 SSRH).	_____	
1MS-80 (MS To 1B1 SSRH).	_____	
1MS-81 (MS To 1B2 SSRH).	_____	
2.22 At 65% Reactor Power, maintain steady state conditions for ~ 15 minutes for NI calibration check.	_____	_____
2.23 At ~ 70% power, perform Enclosure for "Steam Extraction Check Valve Test" of PT/1/B/290/05 (Secondary System Protection Test).	_____	

OP/1/A/1102/04
ENCLOSURE 3.3
POWER ESCALATION (15% to 100% FP)

	Date Init./Time	Verify Date Init./Time
2.24 At ~ 800 MWe, start "E" Heater Drain Pumps per OP/1/A/1106/02 (Condensate and Feedwater System).	_____	
Unit Supervisor _____		
2.25 Stop the power increase at ~ 90% Reactor Power as indicated by Thermal Power Best and if necessary, calibrate all NI's to Thermal Power Best.	_____	_____
2.26 Increase LOAD DEMAND SET to final load desired.	_____	_____
2.27 At ~ 100% Reactor Power, maintain steady state conditions for ~ 15 minutes for NI calibration check.	_____	_____

Control Copy Checked _____

Date/Time _____

OP/1/A/1102/04

ENCLOSURE 3.4

POWER REDUCTION (100% to 15% FP)

Date
Init./Time

1.0 Initial Conditions

1.1 Auxiliary Steam Header pressurized per OP/0/A/1106/04 (Auxiliary Boiler) or cross connected with other units. _____

1.2 NRC notified per the requirements of OMP 1-10 (Usage and Testing the Emergency Notification System (Red Phone)). _____

1.3 Limits and Precautions have been reviewed. _____

2.0 Procedure

2.1 If cooldown and depressurization of the R. C. System in preparation for maintenance on the RC System or HPI System is to be performed, degassification per OP/1/A/1102/12 (Degassification of Reactor Coolant and Pressurizer) should be started 72 hours prior to the estimated time of placing the LPI System in service.

2.2 Notify the Area Dispatcher of the load reduction. _____

2.3 Advise plant personnel of load reduction as necessary.

2.4 Place the Unit Load Demand Station in local control. _____

2.5 Reduce reactor power to the desired power level. _____

2.6 Set Load Demand Min. Limit Set at 125 MWe. _____

OP/1/A/1102/04
ENCLOSURE 3.4
POWER REDUCTION (100% to 15% FP)

Date
Init./Time

2.7 At approximately 800 MWe:

2.7.1 Stop "E" Heater Drain pumps. _____

2.7.2 Place Recirc. Control Switch to AUTO. _____

2.8 At approximately 400 MWe:

2.8.1 Stop "D" Heater Drain pumps. _____

2.8.2 Place Recirc. Control Switch to AUTO. _____

NOTE: (2.9) It is preferred that "1B" FDWP be taken out of service first. This is due to the differences in High Pressure Discharge Trip Setpoints.

2.9 At approximately 350 MWe, take one Feedwater Pump out of service per OP/1/A/1106/02 (Condensate and Feedwater System). _____

Unit Supervisor _____.

2.10 At approximately 325 MWe:

2.10.1 Stop all but one Condensate Booster Pump and two Hotwell Pumps. _____

2.10.2 Place control switches in AUTO. _____

CAUTION: (2.11) If either S/G has a BTU Limit, then a possible FDW Runback could occur.

2.11 Verify that the following are <u>not</u> in alarm before decreasing power below 25%:

1SA-2/C-5 (RC STM GEN "A" BTU LIMIT) _____

1SA-2/D-5 (RC STM GEN "B" BTU LIMIT) _____

2.11.1 If either SG has a BTU Limit, then notify the Control Room SRO for direction on decreasing power below 25%. _____

OP/1/A/1102/04
ENCLOSURE 3.4
POWER REDUCTION (100% TO 15% FP)

Date
Init./Time

2.12 At 200 MWe, transfer Auxiliaries from 1T to CT1 per OP/1/A/1107/02 (Normal Power). _____

Unit Supervisor _____

2.13 At 180 MWe, open the following Shell Drain valves on Moisture Separator Reheaters and HP Heater Vent Orifice Bypasses:

1HD-405 (1A1 FSRH SHELL DRAIN). _____

1HD-406 (1A2 FSRH SHELL DRAIN). _____

1HD-407 (1B2 FSRH SHELL DRAIN). _____

1HD-408 (1B1 FSRH SHELL DRAIN). _____

1HV-5 ("1A1" Heater Vent Orifice Bypass). _____

1HV-47 ("1B2" Heater Vent Orifice Bypass). _____

1HV-12 ("1B1" Heater Vent Orifice Bypass). _____

2.14 At ~ 135 MWe, if Turbine is to be taken off line:

Close 1MS-76 (MS To 1A1 & 1A2 SSRH). _____

Close 1MS-79 (MS To 1B1 & 1B2 SSRH). _____

Verify 1AS-8 (AS To STM SEAL REG) open. _____

2.15 IF the Turbine/Reactor is to be shutdown, refer to OP/1/A/1102/10 (Controlling Procedure for Unit Shutdown). _____