

Duke Power Company PROCEDURE PROCESS RECORD

(1) ID No. PT/0/A/0610/21
Change(s) 0 to
N/A Incorporated

PREPARATION

(2) Station OCONEE NUCLEAR

(3) Procedure Title DEGRADED GRID AND SWITCHYARD ISOLATION FUNCTIONAL TEST

(4) Prepared By James O. De Date 5-4-93

(5) Reviewed By David Weathering Date 5-5-93

Cross-Disciplinary Review By J.V. Kerwell (Systems) 5-11-93 N/R _____

(6) Temporary Approval (if necessary)
By _____ (SRO) Date _____

By _____ Date _____

(7) Approved By Sam E. Rabinowitz Date 5-13-93

(8) Miscellaneous ds

Reviewed/Approved By (Koswac) M. Butts Date 05-11-93

Reviewed/Approved By DM [Signature] elec. Eng. Date 5-13-93

(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)

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PDR ADOCK 05000269
P PDR

Duke Power Company
10CFR50.59 Evaluation
for Procedures and Procedure Changes
Page 1

(1) STATION: OCONEE NUCLEAR UNIT(S): 5

(2) EVALUATION FOR: DEGRADED GRID AND SWITCHYARD ISOLATION FUNCTIONAL TEST

(3) SCREENING FOR INCREASED MANAGEMENT INVOLVEMENT:

Does this item involve infrequently run tests or evolutions that have the potential to significantly degrade the level of nuclear safety?

Yes No

David Weatheras
Procedure Reviewer

5-5-93
Date

• If the answer is "Yes," consult with Superintendent of Operations for determining additional controls.

James E. Rector
Superintendent of Operations

5-13-93
Date

(4) TECHNICAL SPECIFICATION REVIEW:

Will this item require a change to the station Technical Specifications? Yes No

Tech Specs. Section(s) Consulted and Licensing/Compliance personnel contacted: 3.7, 4.6

• If the answer is "Yes" in Part (4), proceed to Part (8)

(5) SCREENING FOR 10CFR50.59 APPLICABILITY:

Does this evaluation item:

affect structures, system, or components that are addressed in the FSAR in a significant manner? Yes No

appear significant enough as to require inclusion in the FSAR? Yes No

involve procedures as described in the FSAR in a significant manner? Yes No

involve tests or experiments not addressed in the FSAR? Yes No

Provide FSAR Sections Consulted, and justification if all answers are "No." See part 7

• If the answer is "Yes" for any of the questions in Part (5), proceed to Part (7). If the answer is "No" for all of the questions in Part (5), complete Part (6) and stop.

(6) Parts 1-5

Prepared by/Date: James A. [Signature] 5-4-93

Reviewed by/Date: David Weatheras 5-5-93

Performed by: _____

PT/0/A/0610/21

Date _____

DUKE POWER COMPANY

OCONEE NUCLEAR STATION

DEGRADED GRID AND SWITCHYARD ISOLATION FUNCTIONAL TEST

1.0 PURPOSE

- 1.1 To functionally verify Overhead ACB and PCB-9 operation during Switchyard Isolation.
- 1.2 To demonstrate operability of the Degraded Grid Protection System by switchyard isolation, a Keowee Unit realignment from Grid to Overhead path, and Underground Unit startup.

2.0 REFERENCES

- 2.1 Technical Specifications 4.6.5
- 2.2 Design Basis Documents and TAC Sheets for 230KV Switchyard, Keowee Emergency Power, Degraded Grid Protection System
- 2.3 OEE-39, 39A, 39B 230KV Switchyard Control PCB No. 9 Trip Coil No.1, Trip Coil No. 2, Close Coil
- 2.4 OEE-48 230KV Switchyard Control PCB No. 18 Control
- 2.5 OEE-76-1, External Grid Trouble Protective Channel 1 Logic
- 2.6 OEE-76-2, External Grid Trouble Protective Channel 2 Logic
- 2.7 OEE-76-4, 4A External Grid Trouble Protective System Voltage Channel 1
- 2.8 OEE-76-5 External Grid Trouble Protective System Volt. Ch.1 Contact Development

- 2.9 OEE-76-8, 8A External Grid Trouble Protective System Voltage Channel 2
- 2.10 OEE-76-9 External Grid Trouble Protective System Volt. Ch.2 Contact Development
- 2.11 OEE-76-12, 12A External Grid Trouble Swyd. Isolated Signal Channel 1, Channel 2
- 2.12 KEE-114, 214 Keowee Hydro Station ACB-1 Control, ACB-2 Control
- 2.13 OEE-1,2,317-1H Standby Breaker Closing and Loadshed Initiation (Channel 1)
- 2.14 OEE-117-92-OC 4160V Switchgear OTS1 Emergency Power Switching Logic Interposing Relays
- 2.15 OEE-120 Channel "A" Keowee Emergency Start, Unit 1

3.0 TIME REQUIRED

- 3.1 8 hours - Unit 2 Refueling (Two Technicians, Three Operators, One Keowee Operator)
- 3.2 Test complexity and potential for loss of DHR from power failure implies the Operations Unit Supervisor and at least one Reactor Operator should have no other duties during this test. Additionally, personnel responsibilities are as follows:
 - One Designated Systems Engineering person - available to resolve any technical questions during the test and provide support as required to Shift Supervisor/Management Designee.
 - One Management Designee - Designated by the Superintendent of Operations to monitor the test and provide support to the Shift Supervisor during critical portions of this test. This designee has the authority to abort the test and, if necessary, provide recommendations to the Shift Supervisor on actions to place the plant in a stable condition. This designee will give or oversee a pre-job briefing with the affected personnel.

- One Keowee Operator - perform actions per procedure and monitor the Hydro Units while operating during this test.

4.0 PREREQUISITE TESTS

None

5.0 TEST EQUIPMENT

5.1 Four Radios

5.2 ES Cabinet Key

6.0 LIMITS AND PRECAUTIONS

6.1 CT-1, 2, and 3 transformers are inoperable during the time between Switchyard isolation and reconnection of Startup Transformers to Red Bus.

6.2 The time Keowee Units are operated in Emergency Start mode must be limited to < 24 hours.

7.0 REQUIRED STATION STATUS

____ 7.1 Unit 2 in Refueling Outage

____ 7.2 Unit 1 at steady-state conditions, on or off-line.

____ 7.3 Unit 3 at steady-state conditions, on or off-line.

____ 7.4 Both Keowee Units available for operation.

____ 7.5 230 KV Switchyard in Normal alignment AND NO testing in progress.

____ 7.6 Standby Shutdown Facility operable.

8.0 PREREQUISITE SYSTEM CONDITIONS

8.1 Unit 2 systems:

____ Main transformer backcharged and 2T suppling both MFBs.

_____ CT-2 charged and available to supply both MFBs.

_____ RCS level on LT-5 > 80 inches OR Reactor vessel defueled.

_____ ES Channel 1 operable.

_____ Unit 2 Operations Supervisor to prevent any ES testing.

_____ Verify Equipment Hatch closed OR Reactor defueled.

_____ Verify External Grid Trouble Protection System (EGTPS) operable and reset.

8.2 Unit 1 systems:

_____ Verify ES testing is NOT in progress.

_____ Unit 1 Operations Supervisor notified to prevent any ES testing during this test.

_____ Verify Unit 1 is NOT under any Tech. Spec. 3.7 LCOs.

_____ MFBs supplied by EITHER Main "T" or via Standby Busses.

_____ Turbine Driven Emergency Feedwater pump available.

8.3 Unit 3 systems:

_____ Verify ES testing is NOT in progress.

_____ Unit 3 Operations Supervisor notified to prevent any ES testing during this test.

_____ Verify Unit 3 is NOT under any Tech. Spec. 3.7 LCOs.

_____ MFBs supplied by EITHER Main "T" or via Standby Busses.

_____ Turbine Driven Emergency Feedwater pump available.

_____ 8.4 Notify Keowee Operations power will be momentarily lost to the Aux. Swgr. of the Overhead Keowee Unit in steps 12.11 and 12.33.

_____ 8.5 Record which Keowee Unit is aligned to the Overhead: _____.

_____ 8.6 Energize CT-5 with Lee Gas Turbine on the Dedicated line per OP/0/A/1107/03, 100kV Power System.

8.7 Using OP/0/A/1107/11, Removal and Restoration of Auxiliary Electrical Systems, perform the following:

_____ Isolate BOTH Jocassee lines from the 230 KV Yellow Bus using disconnects, then re-close PCBs 12 and 15.

_____ Open and isolate PCB-33 from Yellow Bus with disconnects, then reclose PCB-33.

8.8 Notify the following:

_____ Spartanburg Dispatcher

_____ Charlotte Dispatcher

_____ Operations Shift Supervisor

_____ Operations Unit 1 Supervisor

_____ Operations Unit 2 Supervisor

_____ Operations Unit 3 Supervisor

_____ Keowee Personnel

_____ Unit 2 Outage Manager

_____ Switchyard Coordinator

_____ Shift Manager

_____ 8.9 List and evaluate statalarms in "Alarm" on SA-2, 3, 4, 5, 6, 15, 16; 1,2,3SA-7, 14, 15, 16 on Enclosure 13.1.

_____ 8.10 List names below of personnel assigned per step 3.2 which are required to be available from steps 12.1 through 12.41:

Systems Engineering Representative: _____

Management Designee: _____

_____ 8.11 Conduct pre-job briefing with Shift Operations, including:

Test method described in Section 9.0.

Declaration of LCO for Units 1, 2, and 3.

Review potential loss of power and Turbine trip actions with references to AP/1,2,3/A/1700/11, Loss of Power.

_____ 8.12 Install Recorders per WR # _____.

9.0 TEST METHOD

9.1 Initial alignment of the Station Electrical System requires Normal Power status for all PCBs and power paths. Potential Yellow Bus loads such as Jocassee and the AUTO-BANK are isolated; but still require the associated PCBs to be closed. Placement of the Overhead Keowee Unit on the Grid creates the initial condition to verify the Overhead ACB and PCB-9. Only major statalarms have been listed for verification in the procedure.

9.2 Actuation of the Emergency Start logic with a Keowee Unit on the Grid allows verification of the associated ACB-1 or 2 trip and reclose feature. Unit 1, 2, & 3 RCP feeder breaker from Startup AND Main Feeder Bus transfer switches are placed in MANUAL. This protects the Overhead Keowee Unit from overload if either Oconee Unit trips while the Keowee Unit is idling on the Yellow Bus.

9.3 ES Channel 1 is armed with a "TEST" signal to provide permissive to the Degraded Grid Protection System (DGPS). DC control power breaker is opened to one External Grid Trouble Protection System (EGTPS) channel to provide full input-to-end result verification of the active channel. The defeated channel will be alternated each time this test is performed to provide a complete system

input-to-result verification. RCP 2B2 is started on the Overhead Keowee Unit for data recording before restoring the Yellow Bus to Normal Power alignment.

- 9.4 Actual switchyard isolation is initiated from Unit 2 by inserting ES Channel 1, RZ module for "Loadshed & Standby bkr. Close", then simultaneously depressing the "TRIP" buttons on panel 2AT8 for Unit 1 and Unit 2 DGPS CT Undervoltage relays. LCO for CT-1, 2, and 3 power unavailable must be declared at the point of Switchyard Isolation.
- 9.5 Relay action, PCB operation, and Keowee response is verified.
- 9.6 After system actuation, only relay logic of the second channel is verified to minimize the impact and wear on systems.

10.0 DATA REQUIRED

None

11.0 ACCEPTANCE CRITERIA

- 11.1 Underground Keowee Unit starts and energizes CT-4.
- 11.2 Overhead Keowee Unit separates from the Grid and energizes all Unit Startup Transformers from the isolated Yellow Bus.

12.0 PROCEDURE

12.1 Rotate logic test module switch in Unit 2:

_____/_____
ES Cabinet 4, Channel 1, counterclockwise to Test Position #9.

12.2 Perform the following:

12.2.1 Transfer control of the Keowee Hydro Units from Keowee to Oconee for test duration.

12.2.2 Perform Operability Verification of the Keowee Underground Unit per OP/0/A/1106/19, Keowee Hydro at Oconee.

_____ 12.2.3 Close both SL1 and SL2 breakers per OP/0/A/1107/03, 100kV Power System.

_____ 12.2.4 Place the Overhead Keowee Unit on the System Grid at 10 - 20 MWe and positive VARs.

_____ 12.3 Verify Jocassee and AUTO-BANK loads isolated from the Yellow Bus.

_____/_____ 12.4 Open breaker 13 in Panel DYC to disable Channel 1 External Grid Trouble Protection (Undervoltage) circuit. (SA16-A1 Alarms)

_____/_____ 12.5 Open breaker #4 in 2DIA to prevent unnecessary tripping of OTS1-1.

_____ 12.6 Establish communications between Unit 2 Cable Room, Unit 1 & 2 Control Room, Keowee, and the 230 KV Switchyard Relay house.

12.7 Verify the following prepared for Switchyard Isolation:

_____ Shift Supervisor

_____ Unit 1 Supervisor

_____ Unit 2 Supervisor

_____ Unit 3 Supervisor

_____ Keowee Operator

_____ 230 KV Relay house

12.8 Place the following AUTO/MAN transfer switches in MAN:

_____/_____ • Unit 1 "1TA AUTO/MAN"

_____/_____ • Unit 1 "1TB AUTO/MAN"

_____/_____ • Unit 1 "4 KV MFB1 AUTO-MAN"

_____/_____ • Unit 1 "4 KV MFB2 AUTO-MAN"

_____/_____ • Unit 2 "2TA AUTO/MAN"

_____/_____ • Unit 2 "2TB AUTO/MAN"

_____/_____ • Unit 2 "4 KV MFB1 AUTO-MAN"

(Continued on next page)

____/____ • Unit 2 "4 KV MFB2 AUTO-MAN"

____/____ • Unit 3 "3TA AUTO/MAN"

____/____ • Unit 3 "3TB AUTO/MAN"

____/____ • Unit 3 "4 KV MFB1 AUTO-MAN"

____/____ • Unit 3 "4 KV MFB2 AUTO-MAN"

____/____ 12.9 Depress Unit 2, ES Channel 1, RZ module for "Loadshed & Standby
bkr. Close" MANUAL pushbutton.

____ 12.10 Have Keowee Operations place Underground Keowee Unit DC Lift Pump
in "MANUAL", then place in "AUTO" after Unit is started.

____ 12.10.1 Declare LCO for Unit 1 & 3 Startup Transformers per T.S.
3.7.2(i).

NOTE: Step 12.11 will cause Switchyard Isolation, Keowee Emergency start, cycling of
Overhead ACB and PCB-9. Breaker cycling will occur within 4 - 7 seconds.

12.11 At Cabinet 2AT8, depress and hold for ~ 20 seconds:

____ • "TRIP" button for Unit 1 DGPS CT Undervoltage relay.

____ • "TRIP" button for Unit 2 DGPS CT Undervoltage relay.

12.12 When PCB-9 recloses, verify:

____ BOTH Keowee Units ON ____ Overhead ACB cycled

____ 1SA14-E6 Alarm ____ 1SA15-E6 Alarm

____ SA16-A3 Alarm

____ PCB-8 OPEN ____ PCB-9 CLOSED

____ PCB-12 OPEN ____ PCB-18 CLOSED

(Continued on next page)

_____ PCB-15 OPEN	_____ PCB-20 CLOSED
_____ PCB-17 OPEN	_____ PCB-23 CLOSED
_____ PCB-21 OPEN	_____ PCB-27 CLOSED
_____ PCB-24 OPEN	_____ PCB-30 CLOSED
_____ PCB-26 OPEN	_____ PCB-28 OPEN
_____ PCB-33 OPEN	_____ CT-1 ENERGIZED
_____ CT-2 ENERGIZED	_____ CT-3 ENERGIZED

12.13 Verify the following relays energized:

_____ 94V2a	_____ 94V2c
_____ 94V2b	_____ 94V2d

_____ 12.14 Reset Switchyard Isolate Undervoltage Channel 2 and verify:

_____ SA15-C3 Reset.

_____/_____ 12.15 Close breaker 13 in Panel DYC for DC Control to Channel 1 EGTPS.

_____/_____ 12.16 Simultaneously depress and hold "TRIP" buttons for Unit 1 AND Unit 2 DGPS CT Undervoltage relays.

_____ 12.16.1 Verify SA16-C1 Alarm

_____ 12.17 When Channel 1 switchyard isolate relays energize, release both "TRIP" buttons for Unit 1 and Unit 2 DGPS CT Undervoltage relays.

_____ 12.17.1 Verify SA16-C1 Reset

12.18 Verify the following relays energized:

_____ 94V1a	_____ 94V1c
_____ 94V1b	_____ 94V1d

____/____ 12.19 Depress Unit 2, ES Channel 1, RZ module for "Loadshed & Standby
bkr. Close" AUTO pushbutton.

____ 12.20 Reset both Switchyard Isolate Undervoltage logic Channels and
verify:

____ SA15-C1 Reset

____ SA15-C3 Reset.

12.21 Perform the following:

____/____ 12.21.1 Open PCB-18

____/____ 12.21.2 Close PCB-17

____/____ 12.21.3 Open PCB-30

____/____ 12.21.4 Close PCB-28

____ 12.21.5 Exit LCO for Unit 1 & 3 Startup Transformers inoperable.

____ 12.21.6 Enter LCO for Keowee Overhead Unit inoperable due to
PCBs 18 and 30 open. (Reference OP/0/A/1107/11)

12.22 Place the following AUTO/MAN transfer switches in AUTO:

____/____ • Unit 1 "1TA AUTO/MAN"

____/____ • Unit 1 "1TB AUTO/MAN"

____/____ • Unit 1 "4 KV MFB1 AUTO-MAN"

____/____ • Unit 1 "4 KV MFB2 AUTO-MAN"

____/____ • Unit 3 "3TA AUTO/MAN"

____/____ • Unit 3 "3TB AUTO/MAN"

____/____ • Unit 3 "4 KV MFB1 AUTO-MAN"

____/____ • Unit 3 "4 KV MFB2 AUTO-MAN"

12.23 Verify stopped:

_____/____ RCP 2B2

_____/____ RCP 2A2

12.24 Transfer switchgear 2TB from N to E by:

_____/____ 12.24.1 Open 2TB Normal 6.9 kV Feeder Breaker

_____/____ 12.24.2 Close 2TB Startup 6.9 kV Feeder Breaker

____ 12.25 Verify all recording stations ready for starting a RCP.

_____/____ 12.26 Start 2B2 RCP per PT/0/B/200/05B, Run of Reactor Coolant Pump Motors After Maintenance.

_____/____ 12.27 When data collection is complete, stop RCP 2B2 per PT/0/B/200/05B, Run of Reactor Coolant Pump Motors After Maintenance.

12.28 Transfer switchgear 2TB from E to N by:

_____/____ 12.28.1 Open 2TB Startup 6.9 kV Feeder Breaker

_____/____ 12.28.2 Close 2TB Normal 6.9 kV Feeder Breaker

12.29 Position the following PCBs:

_____/____ 12.29.1 Open PCB-27

_____/____ 12.29.2 Close PCB-26

_____/____ 12.30 Open PCB-9.

12.31 Synchronize and close or verify closed:

_____/____ PCB-17

_____/____ PCB-18

_____/____ PCB-26

_____/____ PCB-27

_____/____ PCB-28

_____/____ PCB-30

12.32 Verify the following energized:

_____ CT-1

_____ CT-2

_____ CT-3

_____/_____ 12.33 Open the Overhead ACB.

12.34 Synchronize and close:

_____/_____ PCB-8

_____/_____ PCB-9

NOTE: Resetting Emergency Start will automatically shutdown Overhead Keowee Unit due to load rejection protective relaying on ACB.

_____/_____ 12.35 Depress Unit 1 "Keowee Logic Reset Channel 1" button. (1UB1)

_____/_____ 12.36 Depress Unit 1 "Keowee Logic Reset Channel 2" button. (1UB1)

_____ 12.37 Shutdown Underground Keowee Unit per OP/0/A/1106/19, Keowee Hydro at Ocone.

12.38 Perform the following:

_____/_____ 12.38.1 Synchronize and close PCB-21.

_____/_____ 12.38.2 Synchronize and close PCB-24.

12.39 Rotate logic test module switch in Unit 2:

_____/_____ ES Cabinet 4, Channel 1, clockwise to OPERATE Position.

_____/_____ 12.40 Close breaker #4 in 2DIA for ES signal to OTS1-1.

12.41 Perform either of the following:

____ Verify Acceptance met.

____ If Acceptance NOT met, notify Test Supervisor/Shift Manager.

____ 12.42 List statalarms in "Alarm" on SA-2, 3, 4, 5, 6, 15, 16; 1,2,3SA-7, 14, 15, 16 on Enclosure 13.1 and evaluate any which changed state.

____ 12.43 Restore both Jocassee lines through PCB-12 and 15 per OP/O/A/1107/11, Removal and Restoration of Auxiliary Electrical Systems.

____ 12.44 Restore AUTO-BANK connection through PCB-33 and disconnects per OP/O/A/1107/11, Removal and Restoration of Auxiliary Electrical Systems.

____ 12.45 Return control of Keowee Units to Keowee Operations.

____ 12.46 Lee Gas Turbines are no longer required and may be secured per OP/O/A/1107/03, 100kV Power Supply.

12.47 Notify the following of test completion:

____ Spartanburg Dispatcher

____ Charlotte Dispatcher

____ Operations Shift Supervisor

____ Operations Unit 1 Supervisor

____ Operations Unit 2 Supervisor

____ Operations Unit 3 Supervisor

____ Keowee Personnel

____ Unit 2 Outage Manager

____ Switchyard Coordinator

____ Shift Manager

13.0 ENCLOSURES

13.1 Statalarms

