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CONTROL NO: 4180

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FROM: Duke Power Company Charlotte, N. C. 28201 A. C. Thies		DATE OF DOC 5-3-74	DATE REC'D 5-10-74	LTR X	MEMO	RPT	OTHER
TO: Mr. Moore		ORIG 1 signed	CC	OTHER	SENT AEC PDR X SENT LOCAL PDR X		
CLASS	UNCLASS XXXXX	PROP INFO	INPUT	NO CYS REC'D 1	DOCKET NO: <u>50-269</u> 270/287		
DESCRIPTION: Ltr re our 1-21-74 ltr.....trans the following:				ENCLOSURES: REPORT: Description & safety evaluation of modifications of the Oconee Nuclear Station 230 KV switchyard breaker failure relay circuitry.			
PLANT NAME: Oconee Units 1, 2 & 3				( 1 cy rec'd)			

**ACKNOWLEDGED**  
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FOR ACTION/INFORMATION 5-11-74 AB

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DUKE POWER COMPANY

POWER BUILDING

422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28201

A. C. THIES  
SENIOR VICE PRESIDENT  
PRODUCTION AND TRANSMISSION

P. O. Box 2178

May 3, 1974



Mr. V. A. Moore, Assistant Director  
For Light Water Reactors Group 2  
Directorate of Licensing  
Office of Regulation  
U. S. Atomic Energy Commission  
Washington, D. C. 20545

Re: Oconee Nuclear Station  
Docket Nos. 50-269-270, -287

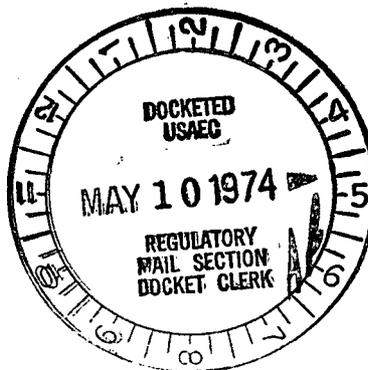
Dear Mr. Moore:

In response to your letter of January 21, 1974, please find attached a description and safety evaluation of modifications of the Oconee Nuclear Station 230 KV switchyard breaker failure relay circuitry.

Very truly yours,

A. C. Thies

ACT:gje  
Attachment



DUKE POWER COMPANY  
OCONEE NUCLEAR STATION  
SAFETY EVALUATION  
MODIFICATIONS TO THE 230 kV SWITCHYARD

Introduction

On January 4, 1974, a spurious signal in a multi-conductor cable between the Oconee Nuclear Station and the 230 kV switchyard actuated multiple solid state breaker relays located in the switchyard relay house. A report describing this incident was transmitted to the AEC by A. C. Thies's letter of January 14, 1974. Mr. V. A. Moore's letter of January 21, 1974, requested a safety evaluation be provided prior to modification of the breaker failure relay circuits; this evaluation responds to that letter.

Corrective Action

The following revisions to the affected circuit breaker failure relay circuits will be made to prevent actuation by spurious induced signals:

- (1) The five transformer lockout relay contact circuits from station to switchyard will be run in separate cables.
- (2) Additional ground cables will be installed in trenches between the station and the switchyard for increased electrostatic shielding.
- (3) Interposing relays with 125V DC coils will be installed in these circuits in the switchyard relay house.
- (4) Connecting circuitry from interposing relays to breaker failure relays will be by shielded twisted pair cable.
- (5) The pickup setpoint of the breaker failure relays will be increased from the present value of 15 volts to over 70 volts.
- (6) Overcurrent monitor relays will be installed to monitor the startup transformers for low side faults, and to supervise the interposing relay circuit.

In addition to these six corrective measures, two modifications will be made to assure greater operational reliability. The red and yellow bus differential relaying will be placed on separate panels and supplied by separate DC power sources. The 24V DC trip interposing relays utilized in the individual circuit breaker control circuits will be replaced with relays having 125 V coils.

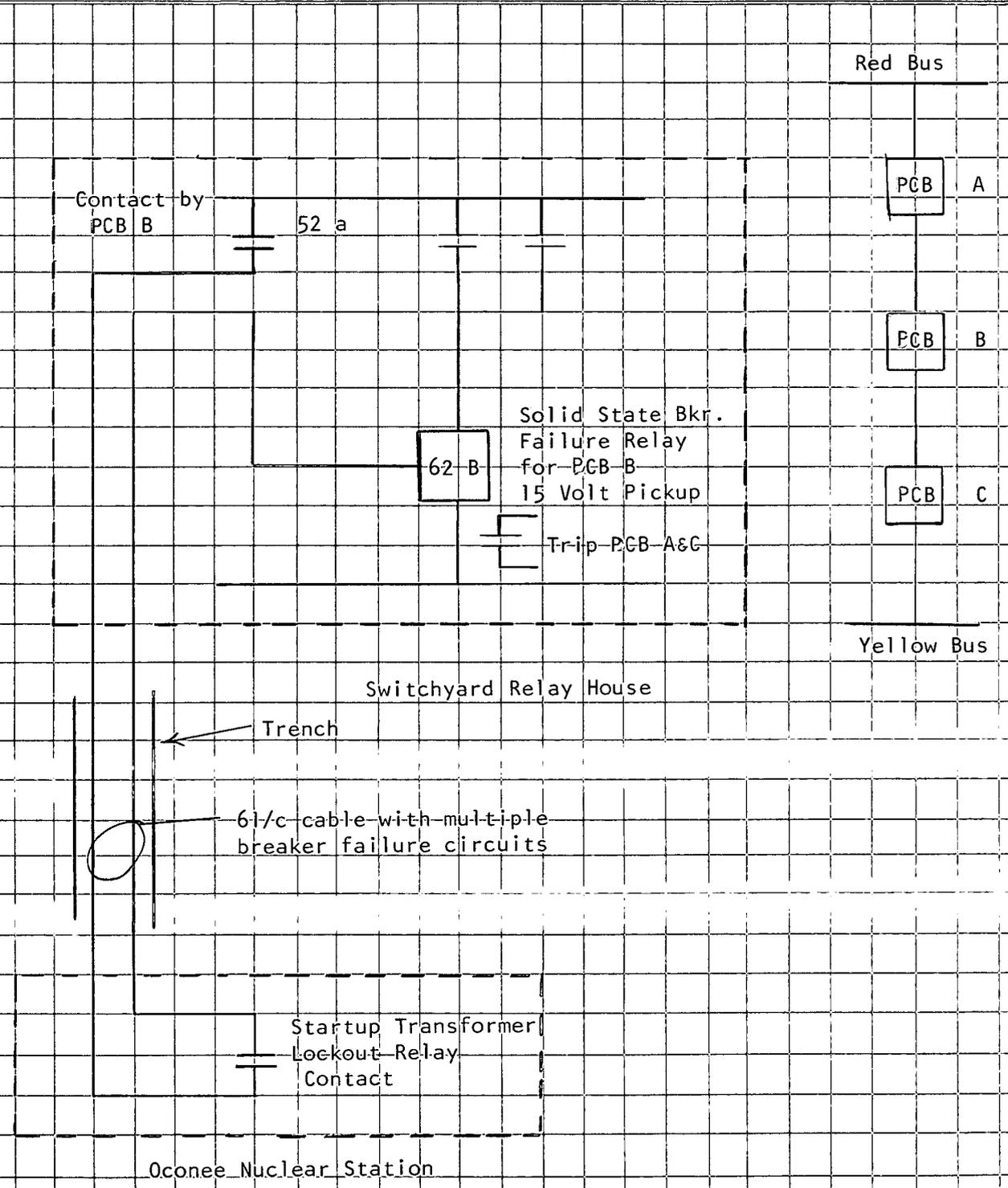
Safety Evaluation

The separation of the five transformer lockout contact circuits into five individual cables will prevent any induced currents in one cable from affecting more than one breaker failure relay initiating circuit. The additional ground cables installed in the trenches between the station and the switchyard will

provide increased electrostatic shielding and will protect the cables from external influences. The installation of the interposing relays with 125V DC coils in the circuit requires that any induced currents produce a voltage of such magnitude that its probability of occurrence is negligible. In the event that such an induced current did occur, it could not operate the interposing relay in the startup transformer lockout circuits unless the transformer overcurrent monitor relay, which supervises the circuit, had operated. In addition, contacts, from the interposing relay will be used to trip the associated circuit breakers. Since this circuit is supervised by PCB breaker auxiliary contacts, this precludes misoperation of the interposing relay which could, heretofore, initiate a false breaker failure signal. To preclude operation of the breaker failure relay by induced current in the circuit from the interposing relay, shielded twisted pair cable is utilized, and the breaker failure relay pick-up setpoint will be increased to a value of approximately 70 volts.

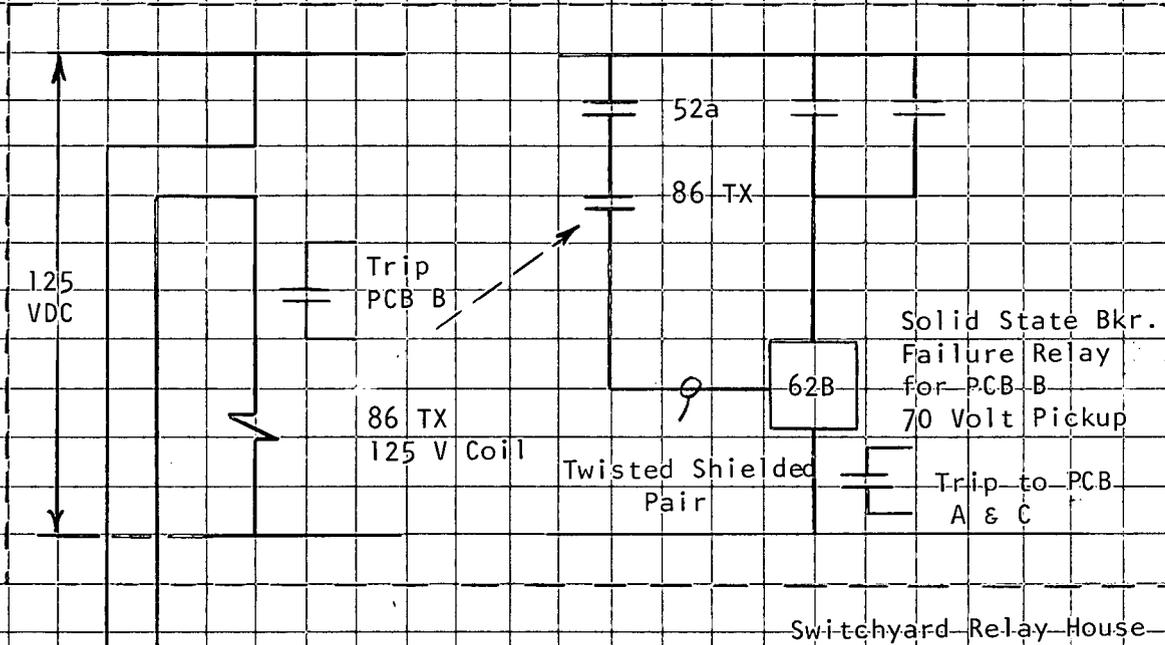
These modifications will preclude the breaker failure relays from inadvertently tripping and isolating the switchyard from induced currents. The schedule for completion for these modifications calls for completion of the required engineering by May 15, 1974, and completion of the modification as soon as practicable thereafter. These modifications will not require any additional surveillance or testing not presently required by the Oconee Technical Specifications.

Development OCONEE NUCLEAR STATION See Dwg. \_\_\_\_\_ File No. \_\_\_\_\_  
Subject PRESENT BREAKER FAILURE RELAY DESIGN Sheet No. 1 of 1  
By \_\_\_\_\_ Date 4/23/74

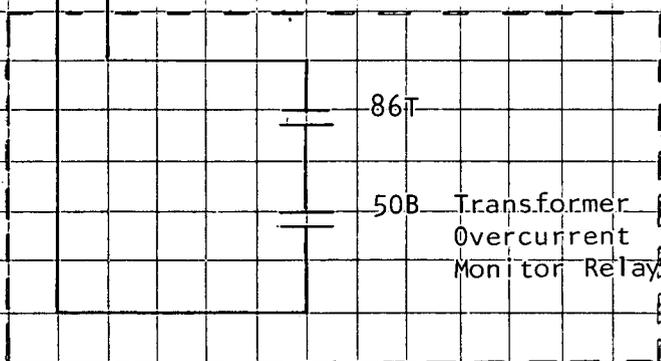


Oconee Nuclear Station

Development OCONEE NUCLEAR STATION See Dwg. \_\_\_\_\_ File No. \_\_\_\_\_  
Subject PROPOSED BREAKER FAILURE RELAY DESIGN Sheet No. 1 of 1  
By \_\_\_\_\_ Date 4/23/74



61/c cable with one breaker failure circuit per cable



Oconee Nuclear Station