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 STOLZ, J.F. Operating Reactors Branch 4

SUBJECT: Responds to 850128 list of questions re Items 4.2.1 & 4.2.2 of Generic "Preventive Maint Program for Reactor Trip Breaker/Maint & Trending" to complete evaluation of 831104 response. Revised response to Item 4.1 encl.

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March 29, 1985

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. J. F. Stolz, Chief
Operating Reactors Branch No. 4

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

Dear Sir:

By letter dated January 28, 1985, the NRC Staff requested additional information to complete evaluation of Duke Power Company's (Duke) response to Generic Letter 83-28 submitted to the NRC on November 4, 1983. Specifically, the NRC requested Duke's response to a list of questions relative to Items 4.2.1 and 4.2.2, "Preventive Maintenance Program for Reactor Trip Breaker/Maintenance and Trending".

Enclosure 2 provides Duke's response to the requested additional information with respect to Items 4.2.1 and 4.2.2. In addition, since our response to Generic Letter 83-28 on November 4, 1983 and an augmented response on August 10, 1984 additional information has become available which warrants a revised response to Item 4.1. Therefore, Enclosure 1 represents Duke's revised response to Generic Letter Item 4.1.

Very truly yours,



Hal B. Tucker

MAH:slb

Enclosure

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ENCLOSURE 1

Duke Power Company
Oconee Nuclear Station
Revised Response to GL 83-28 Item 4.1

In 1984, the B&W Owners Group undertook a program to evaluate various possible modifications of the GE-AK-2 reactor trip breakers. The result of this evaluation was the selection of a modification involving the changeout of the initial breaker lubricant to the Mobil 28 lubricant. This evaluation and the resulting conclusions were presented to the NRC Staff at a meeting on October 11, 1984. Presently, Duke has replaced the lubricant on all breakers in service on Oconee 1 and will complete Units 2 and 3 by the end of current Unit 2 refueling outage, approximately on April 20, 1985.

This modification is consistent with the GE recommended modifications.

ENCLOSURE 2

Duke Power Company
Oconee Nuclear Station
Response to the NRC Request for Additional Information
GL 83-28, Items 4.2.1 and 4.2.2

1. Item 4.2.1 - Periodic Maintenance Program for Reactor Trip Breakers

1.1 Criteria for Evaluating Compliance with Item 4.2.1

The Oconee Units 1, 2 and 3 Reactor Trip Systems utilize General Electric AK-2A circuit breakers. The primary criteria for an acceptable maintenance program for this breaker are contained in Maintenance Instruction GEI-50299EI*, "Power Circuit Breakers, Types AK-2/2A-15, AK-2/3/2A/3A-25, AKU-2/3/2A/3A-25", and Service Advice 9.3S and 9.20, by General Electric. The staff has reviewed these items and endorsed the maintenance program they describe. More specifically, the criteria used to evaluate compliance include those items in the General Electric instructions and advisories that relate to the safety function of the breaker, supplemented by those measures that must be taken to accumulate data for trending. The acceptable maintenance activity interval is six months.

Response

Because of the problems associated with the old lubricant and sticking of the trip shaft assembly of the Reactor Trip Breakers, Duke decided to perform preventive maintenance on the breakers at three month intervals until new trip shaft bearing assemblies are installed (See RO-269/83-20, dated January 11, 1984). With the completion of the modifications and change-out of lubricant to Mobil 28, Duke will begin performing preventive maintenance on the breakers at six month intervals.

The GE recommendation for preventive maintenance of breakers with Mobil 28 lubricant is 12 month intervals. Duke will evaluate the performance of preventive maintenance at the recommended 12 month intervals after an adequate data base has been obtained for breakers with the new Mobil 28 lubricant.

1.2 Issues Relating to Item 4.2.1

Your response states that preventative maintenance on the Reactor Trip Breakers is performed at six month intervals and that the Oconee maintenance program meets the intent of GE Service Advice 17509.3S. The submittal also states that the undervoltage trip attachment (UVT) will not be removed to verify clearance between rivet and armature as specified in 175-9.3S, item #S1, because the removal/replacement of the UVT could

create an additional physical interference through improper reinstallation. No procedures were included with the submittal.

The Oconee Units 1, 2 and 3 periodic maintenance program for the reactor trip breakers should include, on a six month basis:

1. Verification of breaker cleanliness and insulation structure; all foreign materials, such as paint, dust, or oil, should be removed to prevent electrical break-down between points of different potential;
2. Verification of breaker physical condition, including wiring insulation and termination, all retaining rings, pole bases, arc quencher, stationary and movable contacts, and tightness of nuts and bolts;
3. Verification of proper manual operation of the breaker, including checks for excessive friction, trip bar freedom, latch engagement, operating mechanism alignment and freedom, and undervoltage trip (UVT) device armature freedom;
4. Verification of the optimum freedom of the armature as specified in General Electric Service Advice 175-9.3S, item #S1;
5. Verification of proper trip latch engagement as specified in Service Advice 175-9.3S, item #S2;
6. Verification of undervoltage pick-up setting, as specified in Service Advice 175-9.3S, item #S3, and dropout voltage;
7. Verification that the trip torque required on the trip shaft is less than 1.5 pound-inches, as specified in Service Advice 175-9.3S, item #S4; "Before" and "After" maintenance torque values should be recorded;
8. Verification of positive tripping by checking the adjustment between the UVT device and trip paddle as specified in Service Advice 175-9.3S, item #S5;
9. Verification of proper trip response time as specified in Service Advice 175-9.3S, item #S6;
10. Lubrication of trip shaft and latch roller bearings with Mobil 28 lubricant;
11. Shunt Trip Attachment (STA) operation verification;

12. Examination and cleaning of breaker enclosure;
13. Functional test of the breaker prior to returning it to service.

You are requested to confirm that the periodic maintenance program includes these 13 items at the specified interval or commit to their inclusion and provide a date by which they will be included.

Response

The Generic Letter 83-28, Item 4.2.1, did not specifically require procedures to be submitted, thus no procedures were provided.

As indicated in our response dated November 4, 1983, the Oconee maintenance procedures for reactor trip breakers require a clearance check for the undervoltage armature to trip latch to assure no drag exists between the rivet and armature without having to remove the device. If there is any hindrance, the current procedures provide instructions for necessary corrections based on the GE recommendations.

Duke's response regarding the periodic maintenance program for the above 13 items is as follows:

1. Duke's preventive maintenance program includes verification of breaker cleanliness and visual inspection of the insulation structure in accordance with Maintenance Instruction GEI-50299EI.
2. The current Duke preventive maintenance program includes verification of breaker physical condition, including wiring insulation and termination, all retaining rings, pole bases, arc quencher, stationary and movable contacts. The tightness of nuts and bolts is currently verified under the present program. However, no procedures to document this verification exists at this time. Duke will modify procedures to include documentation of the tightness of nuts and bolts verification by July 31, 1985.
- 3-9. Duke's preventive maintenance program currently includes verification of breakers with respect to the items described in 3 through 9 above.
10. Duke will lubricate the trip shaft and latch roller bearings with Mobil 28 lubricant during preventive maintenance if determined to be required.
11. The breakers with Shunt Trip Attachment will be verified for operation. The installation of Shunt Trip Attachment on Oconee Unit 1 is complete. Duke plans to complete

installation on Unit 2 during the current refueling outage and on Unit 3 during its upcoming refueling outage (EOC 8).

12. Duke's preventive maintenance program includes examination and cleaning of breaker enclosure.
 13. Duke's preventive maintenance program includes functional test of the breaker prior to returning it to service.
2. Item 4.2.2 - Trending of Reactor Trip Breaker Parameters to Forecast Degradation of Operability.

2.1 Criteria for Evaluation Compliance with Items 4.2.2

Four parameters have been identified for trending and are included in the criteria for evaluation. These are 1) undervoltage trip attachment dropout voltage, 2) trip torque, 3) breaker response time for undervoltage trip, and 4) breaker insulation resistance.

Response

Duke is participating with the B&W Owners Group in the reactor trip breaker reliability program which includes trending of the following parameters on a collective basis for ~2 years:

1. Breaker response time for undervoltage trip.
2. As-found and as-left trip shaft torque values.
3. As-found and as-left undervoltage pickup voltage setpoints.

With respect to the undervoltage trip attachment dropout voltage, Duke will include this item in the Reliability Monitoring Program.

The program does not include breaker insulation resistance measurement for the following reasons:

- a. Breaker insulation resistance variation measurement does not provide useful information due to the relatively large insulation resistance, and
- b. Duke has no experience with the breaker insulation resistance variation to cause the unacceptable operation of the breaker or preventing the breaker from performing its safety function.

2.2 Issues Relating to Item 4.2.2

Your submittal does not address the matter of parametric trending to forecast degradation of reactor trip breakers.

You are requested to commit to inclusion of trip torque, breaker response time and dropout voltage for undervoltage trip and breaker insulation resistance, as trending parameters. You should also identify the organization which will perform trend analysis, how often the analysis will be performed and how the information derived from the analysis will be used to affect periodic maintenance.

Response

As mentioned earlier, Duke is participating with the B&W Owners Group in the reactor trip breaker reliability program. As a part of this program, Duke will provide B&W with trending data collected during preventive maintenance on the reactor trip breakers. B&W will collect trending data from the member utilities and perform trend analysis. The analyzed data will be issued to member utilities on a quarterly basis. It is expected that B&W will provide recommendations if the data indicate further improvements in the preventive maintenance procedures. Duke will review the recommendations, if any, and will act upon if determined a significant improvement in the breaker reliability can be obtained.

Duke will continue to monitor the breaker performance, review our data as well as the results of B&W analysis for indication of any abnormal trends in breaker performance and take action as appropriate.