DUKE POWER COMPANY
P.O. BOX 33189
CHARLOTTE, N.C. 28242

HAL B. TUCKER
VICE PRESIDENT
NUCLEAR PRODUCTION

TELEPHONE
(704) 373-4531

85 JAN 29 P2:24

January 16, 1985

Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Re: Oconee Nuclear Station
Docket No. 50-269

Dear Mr. O'Reilly:

Please find attached a report concerning the response time failure of a Control Rod Drive (CRD) AC breaker during a routine Reactor Protective System (RPS) on-line testing on December 21, 1984. The breaker, which should have opened within 80 milliseconds, did not open for 746 milliseconds. This report is submitted per our commitment to inform NRC of unacceptable performance of CRD breakers.

Very truly yours,

H. B. Tucker/BS

Hal B. Tucker

MAH:slb

Attachment

cc: American Nuclear Insurers
c/o Dottie Sherman, ANI Library
The Exchange, Suite 245
270 Farmington Avenue
Farmington, CT 06032

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

M&M Nuclear Consultants
1221 Avenue of the Americas
New York, New York 10020

INPO Records Center
Suite 1500
1100 Circle 75 Parkway
Atlanta, Georgia 30339

Ms. Helen Nicolaras
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. J. C. Bryant
NRC Resident Inspector
Oconee Nuclear Station

Duke Power Company
Oconee Nuclear Station
Special Report
Response Time Failure of Control Rod Drive
AC Breaker

Introduction:

On December 21, 1984 at 1432 hours with Unit 1 operating at 100% Full Power a Control Rod Drive (CRD) AC Breaker failed a routine Reactor Protective System (RPS) on-line test. The breaker which should have opened within 80 milliseconds (msec), did not open for 746 msec. The immediate corrective action was to place the defective breaker in the "tripped" position. Other corrective actions included on-line testing of all Unit 1 CRD breakers and cleaning of the breaker which failed the on-line test. All Unit 1 CRD breakers passed the on-line test and after being cleaned the failed breaker passed the bench test.

The apparent cause of this incident was failure of the breaker trip latch roller to turn freely as a result of the roller bearings sticking. There were no releases of radioactivity and the health and safety of the public were not affected.

Description of Occurrence:

On December 21, 1984 at 1432 hours a Control Rod Drive (CRD) AC Breaker (#CB-1) failed a routine RPS on-line test. On-line test of the CRD AC Breaker #CB-1 showed a response time of 746 milliseconds (msec) which was greater than 80 msec delay time for CRD breaker assumed in the safety analyses' calculation of overall Reactor Protection System (RPS) delay times. The CRD AC Breaker #CB-1 was retested and had a response time of 15 msec, which was smaller than 80 msec. At this point, however, the old breaker was replaced with a new breaker and all Unit 1 CRD AC breakers were on-line tested and all had trip response times of less than 80 msecs. The bearing assembly on the trip shaft of the failed CRD AC Breaker #CB-1 was cleaned and after passing the bench test was declared operable.

Cause of Occurrence:

The apparent cause of this occurrence was the failure of the trip latch roller to turn freely as a result of roller bearing sticking causing the breaker to delay in opening after the trip signal was received. After the trip latch roller bearing was cleaned, the breaker was bench tested. The trip response time was less than 80 msec.

Analysis of Occurrence:

All other Unit 1 CRD breakers were on-line tested subsequent to this incident. They all tripped successfully. The CRD AC Breaker #CB-1 after being cleaned, successfully passed the bench test.

In the event that an actual reactor trip had been called during this period of time, and the CRD AC Breaker #CB-1 had delayed in tripping, all safety rod groups 1, 2, 3 and 4 and regulating rod groups 5, 6 and 7 would have dropped immediately as designed. This would have been caused by the

interruption of power to the CRD mechanisms by the CRD DC breakers and the silicon control rectifiers (SCRs). Insertion of these rod groups would have shut down the reactor.

The SCRs function independently of the CRD breakers and act to interrupt power to and trip regulating rod group 5, 6 and 7 upon receipt of a trip signal. Thus, the SCRs would have provided a diverse and independent means of shutting down the reactor.

The health and safety of the public were not affected by this event.

Corrective Action:

The immediate corrective action taken was to place the CRD AC Breaker #CB-1 in "tripped" position. Then the old CRD AC breaker was replaced with a new breaker. All CRD AC and DC breakers were on-line tested and all had response time less than the acceptable limit. The CRD AC Breaker #CB-1 was inspected, cleaned and lubricated and bench tested with successful results. The breaker was then declared operable.

The immediate and supplemental corrective actions ensured that all other CRD AC and DC breakers on Unit 1 would have tripped within the acceptance criteria if a trip signal had been received.

The subject breaker is an old General Electric (GE) Type AK 2 breaker. On the GE Type AK 2 breaker, the trip latch roller is part of the front frame. Similar failures of CRD breakers have previously occurred and reported to NRC by Reportable Occurrence Report RO-269/83-20, dated December 30, 1983 and a Special Report, dated August 17, 1984.

Presently a program is being implemented to replace the front frame of all GE Type AK 2 breakers in an attempt to correct these recurring problems. These new front frame assemblies are being installed as a result of the Salem ATWS event. Finally, in an amended response to Generic Letter 83-28, Items 4.1 and 4.2 submitted to NRC on August 10, 1984, Duke activities regarding reactor trip system reliability, preventive maintenance, and surveillance program have been documented.