



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RESPONSE TO GENERIC LETTER 83-28, ITEMS 4.2.1 AND 4.2.2

TOLEDO EDISON COMPANY

AND

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1

DOCKET NO. 50-346

1.0 INTRODUCTION AND BACKGROUND

Subsequent to the anticipated transient without scram (ATWS) events at the Salem Nuclear Power Plant, the Commission reviewed intermediate term actions to be taken by the licensees. The actions taken were developed on the basis of information contained in NUREG-1000, "Generic Implications of ATWS Events at the Salem Nuclear Power Plant." On July 8, 1983, Generic Letter (GL) 83-28 was issued by the NRC. The letter identified NRC positions developed from review of the Salem ATWS events. These positions were related to reactor trip system reliability and general management capability. The Toledo Edison Company (the licensee) responded to GL 83-28 by letters dated November 7, 1983 (Serial No. 1000) and March 29, 1985 (Serial No. 1130).

The specific GL 83-28 items covered by this Safety Evaluation are Section 4.2.1 (Reactor Trip System Reliability - Preventive Maintenance) and Section 4.2.2 (Reactor Trip System Reliability - Trending of Parameters)

2.0 DISCUSSION AND EVALUATION

2.1 Reactor Trip System Reliability (Preventive Maintenance), Item 4.2.1

2.1.1 Licensee Response

The Generic Letter stated:

Licensees and applicants shall describe their preventive maintenance and surveillance program to ensure reliable reactor trip breaker operation. The program shall include a planned program of periodic maintenance, including lubrication, housekeeping, and other items recommended by the equipment supplier.

The licensee stated in the November 7, 1983 response:

Maintenance Procedure MP 1405.05 (480V Type AK Circuit Breaker Maintenance and Testing) was written to provide instructions for the cleaning, inspecting, and testing of GE 480V circuit breakers. The CRD trip breakers have been incorporated into the Preventive Maintenance Program in which Maintenance Procedure MP 1405.05 is performed every refueling cycle or as necessary to ensure the design performance of the breakers. As per Maintenance Procedure MP 1405.05, Surveillance Test ST 5030.20 (CRD Trip Breaker Response Time Test) is performed to test the response time of contact opening after de-energization of CRD trip breaker undervoltage coil as required by Surveillance Test ST 5030.14 (RPS Overall Response Time Calculation). The Surveillance Test ST 5030.14 requires Surveillance Test ST 5030.20 to be performed any time corrective or preventive maintenance is performed that could affect the response time.

2.1.2 Evaluation Criteria

The primary criteria for an acceptable periodic maintenance program are contained in Maintenance Instruction GEI-50299EJ*, Power Circuit Breakers, Types AK-2/2A-15, AK-2/3/2A-25, AKU-2/3/2A/3A-25," and Service Advice 175-9.3S and 175-9.20, by General Electric. The NRC staff, has reviewed these items and endorsed the maintenance program they describe. The criteria include those items in the General Electric Instructions and advisories that relate to the safety function of the breaker, supplemented by those measurements which must be taken to accumulate data for trending. Those items identified for maintenance that should be included in the licensee's RTB maintenance program are:

1. Verification of breaker cleanliness and insulation structure; all foreign materials, such as paint, dust, or oil, should be removed to prevent electrical breakdown 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 (UTV) 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. Shunt Trip Attachment (STA) operation verification;
11. Examination and cleaning of breaker enclosure;
12. Functional test of the breaker prior to returning it to service.

A 12 month interval for preventative maintenance is justifiable based on the GE recommendation that maintenance be performed at least annually, with a hostile environment or severe load condition warranting more frequent maintenance.

The licensee responded in the March 29, 1985 letter that the Davis-Besse preventive maintenance program for RTB's contains all of the elements listed earlier. Further the licensee stated that:

The Davis-Besse Maintenance Department is assigned to collect the data from these parameters on a six month interval, per MP 1405.05. Data from these parameters is given to the B&W Owners Group Availability Group for trending and analysis for the duration of the Reliability Monitoring Program.

Upon completion of the Reliability Monitoring Program, an analysis will be performed to evaluate the interval for performing periodic maintenance. If the analysis indicates a period greater than 12 months is warranted, TED will perform breaker periodic maintenance using the 12 month interval recommended by General Electric, the breaker manufacturer, and B&W, the breaker supplier. If analysis indicates a period less than 12 months is warranted, we will then determine the appropriate conservative interval for performing this maintenance.

Based on the above statements, as well as conversations with the licensee representatives, the staff concludes that preventive maintenance will be performed at intervals not exceeding 12 months, and is therefore, acceptable.

2.2 Reactor Trip System Reliability (Trending of Parameters), Item 4.2.2

2.1.1 Licensee Response

The Generic Letter stated that:

Licensees and applicants shall describe their preventative maintenance and surveillance program to ensure reliable reactor trip breaker operation. the program shall include trending of parameters affecting operation and measured during testing to forecast degradation of operability.

In the responses of November 7, 1983 and March 29, 1985, the licensee stated that Toledo Edison is a member of the B&W Owners Group Reliability Monitoring Program. A presentation of the conceptual program had been previously presented to the staff. Additional information about the scope and detail of the program were presented.

2.2.2 Evaluation Criteria

The parameters measured during the maintenance program noted above which are applicable for trending are undervoltage trip attachment dropout voltage, trip torque, and breaker response time for undervoltage trip. The staff position is that the above three parameters in addition to the breaker insulation resistance are acceptable and recommended trending parameters to forecast breaker operation degradation or failure. If subsequent experience indicates that any of these parameters is not useful as a tool to anticipate failures or degradation, the licensee may, with justification and NRC approval, elect to remove that parameter from those to be tracked.

The licensee measures trip torque, breaker response time, undervoltage trip pickup and dropout voltage and insulation resistance. the licensee is a participant in the B&W Owners Group Reliability Monitoring Program, which is attempting to identify the most effective parameters to forecast breaker degradation or failure. The licensee is providing these data, except for insulation resistance, to the B&W Owners Group Availability Group, which will perform trend analysis. The licensee has identified how often data will be collected and how the information derived from the analysis will be used to affect periodic maintenance. The staff finds the licensee position to be acceptable.

3.0 CONCLUSIONS

Based on a review of the licensee responses, the staff finds the licensee positions on Items 4.2.1 and 4.2.2 of Generic Letter 83-28 to be acceptable.

Dated: November 12, 1985

The following NRC personnel contributed to this Safety Evaluation: N. Romney, G. Dick