SAFETY EVALUATION REPORT
RANCHO SECO NUCLEAR GENERATING STATION UNIT 1
REACTOR TRIP SYSTEM RELIABILITY
ITEMS 4.2.1 AND 4.2.2 OF GENERIC LETTER 83-28

1. INTRODUCTION

On July 8, 1983, the Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 83-28. This letter addressed intermediate-term actions to be taken by licensees and applicants aimed at assuring that a comprehensive program of preventive maintenance and surveillance testing is implemented for the reactor trip breakers (RTBs) in pressurized water reactors. In particular, Item 4.2 of the letter required the licensees and applicants to submit a description of their preventive maintenance and surveillance program to ensure reliable reactor trip breaker operation. The description of the submitted program was to include the following:

GL, Item 4.2.1	A planned program of periodic maintenance, including lubrication, housekeeping, and other items recommended by the equipment supplier.
GL, Item 4.2.2	Trending of parameters affecting operation and measured during testing to forecast degradation of operation.

Sacramento Municipal Utility District (SMUD), the licensee for Rancho Seco, submitted responses to the Generic Letter on November 4, 1983, and May 3, 1985. This report presents an evaluation of the adequacy of those responses and of the licensee's preventive maintenance and surveillance programs for RTBs.

2. EVALUATION CRITERIA

2.1 Periodic Maintenance Program

The primary criteria for an acceptable periodic maintenance program 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 175-9.3S and 175-9.2O, by General Electric, and NRC IE Information Notice No. 85-58. The NRC Staff, Equipment Qualification Branch, 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 at six month intervals 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 (UVT) device armature freedom;

4. Verification of the optimum freedom of the armature;

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.

2.2 Trending of Parameters

Generic Letter Item 4.2.2 specifies that the licensee's preventative maintenance and surveillance program is to include trending of parameters affecting operation and measured during testing to forecast degradation of operation. The parameters measured during the maintenance program described 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.

3. EVALUATION

3.1 Evaluation of the Licensee Position on Item 4.2.1

The licensee states that his preventative maintenance program for RTBs is being revised and will contain all the elements detailed in Section 2.1 of this SER. The licensee states that they will perform maintenance at six-month intervals for one refueling cycle. At that time, the licensee is confident that the results of the B&W Owners Group reliability monitoring program will indicate that a maintenance interval of twelve (12) months or more is appropriate. The staff finds the licensee position on Item 4.2.1 to be acceptable, provided the licensee confirms that the UVT device roller rivet-armature clearance is measured with the UVT armature down in the energized position, as recommended in IE Notice No. 85-58.

3.2 Evaluation of the Licensee's Position on Item 4.2.2

The licensee measures trip torque, breaker response time and undervoltage trip pickup and dropout voltage; the licensee has elected not to monitor insulation resistance on the grounds that SMUD has no experience to indicate that breaker insulation resistance variation has ever caused unacceptable operation of the RTBs or prevented them from performing their safety function. The staff recommends that all four of the parameters identified in Section 2.1 of this SER be monitored, but finds the licensee position acceptable, based on Rancho Seco's experience of no insulation resistance-related problems on RTBs. 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 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 on Item 4.2.2 to be acceptable.

4. 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 83.23 to be acceptable, provided the licensee confirms that the UVT device roller rivet-armature clearance is measured with the UVT armature down in the energized position, as recommended in IE Notice No. 85-68.