GENERAL ELECTRIC

NUCLEAR TEST REACTOR

ANNUAL REPORT NO. 25

LICENSE R-33

DOCKET 50-73

NUCLEAR FUEL ENGINEERING DEPARTMENT • GENERAL ELECTRIC COMPANY
VALLECITOS NUCLEAR CENTER, PLEASANTON, CALIFORNIA 94566

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I. INTRODUCTION

This report summarizes the operation, changes, tests, experiments and major maintenance at the Nuclear Test Reactor (NTR) which were authorized pursuant to License R-33 and 10CFR50, Section 50.59, for the period January 1, 1984, through December 31, 1984.

II. GENERAL

A. The reactor was operated at or above critical for 386.8 hours. A total of 378 startups were made. Four (4) scrams occurred during this report period. Total plant operation equalled 1.34 MW days in 1984.

B. The average radiation exposure to facility personnel was 1.897 Rem.

C. There were no occurrences during 1984 that required notification of the NRC.

D. License R-33 was renewed by Amendment 18 issued on December 28, 1984. The expiration date is October 31, 1997.

III. ORGANIZATION

No changes were made to the facility organization during the 1984 report period.

IV. CHANGES, TESTS, AND EXPERIMENTS APPROVED BY THE FACILITY MANAGER

A. Changes

Pursuant to 10CFR50.59(a), the Facility Manager authorized the following changes during 1984.

1. Remote Area Monitoring (RAM) System Replacement

   Description: The obsolete RAM system was replaced with a newer RAM system.

   Safety Analysis: The new RAM system specifications exceed those of the old system. The system was completely tested after installation.

2. Cell Door Alarms

   Description: The door alarms to two cells were modified to eliminate distractions.

   Safety Analysis: The control of these two High Radiation Areas still fully complies with 10CFR20.203(c)(2).

A. Changes (Continued)

3. Voltage Regulator

Description: A voltage regulator was added to the facility to supply the stack instrumentation, the nuclear instruments, and the area radiation monitors with regulated power.

Safety Analysis: The addition of the voltage regulator increases instrument performance and reliability.

4. Stack Particulate Monitor

Description: This change authorized the replacement of the NTR stack effluent particulate monitor log count rate meter (LCRM) and preamp.

Safety Analysis: The replacement LCRM and preamp are commercially available instruments suitable for this application. The units will be performance tested after installation prior to final acceptance.

5. Stack Gas Monitor Instrument Replacement

Description: The stack gas monitor picoammeter was replaced.

Safety Analysis: The replacement picoammeter performance specifications equalled or exceeded the specifications of the previous unit. The unit was performance tested after installation prior to final acceptance.

B. Tests

Pursuant to 10CFR50.59(a), there were no special tests performed during 1984 which required the approval of the Facility Manager.

C. Experiments

There was a total of 740 individual experiments reviewed, approved and performed in 1984.

Three experiment type approvals (ETA) were reviewed and approved by the Facility Manager during 1984. These ETA's were updates of old experiment type approvals previously described in the Summary Safeguards Report for the General Electric Nuclear Test Reactor or as specified in annual reports submitted since the safeguards report.

There were no new types of experiments either approved or performed during 1984.

V. MAJOR PREVENTIVE OR CORRECTIVE MAINTENANCE

There were no problems during 1984 that required major maintenance.

VI. UNSCHEDULED SHUTDOWNS

There were four (4) reactor scrams during 1984. Each scram was from a different source. One scram was initiated by the operator during an earthquake; one scram was caused by an AC power dip; one scram was operator error; and one was due to safety rod release (unexplained). There was no corrective action required which prevented restart of the reactor shortly after shutdown.

VII. RADIATION LEVELS AND SAMPLE RESULTS AT ON- AND OFF-SITE MONITORING STATIONS

The data below are from sample and dosimeter results accumulated during 1984. Except for the NTR stack data, these data are for the entire VNC site and include the effects of operations other than the NTR.

1. NTR Stack. Total airborne releases (stack emissions) for 1984 are as follows:

Alpha Particulate	< 0.142 µCi	(predominantly radon-thoron daughter products)
Beta-Gamma Particulate	< 1.59 µCi	
Iodine-131	< 31.33 mCi	
Noble Gases	1.94×10^{2} Ci	

Noble gas activities recorded from the NTR stack integrates background readings with the actual releases which may account for 40 to 50% of the activity released.

2. Air Monitors. (Yearly average of all meteorological stations.)

Four environmental air monitoring stations are positioned approximately 90° apart around the operating facilities of the site. Each station is equipped with a membrane filter which is changed weekly and analyzed for gross alpha and gross beta-gamma.

Alpha Concentration:

Maximum	$< 6.1 \times 10^{-15}$ µCi/cc
Average	$< 2.7 \times 10^{-15}$ µCi/cc

Beta-Gamma Concentration:

Maximum	2.2×10^{-13} µCi/cc
Average	$< 4.43 \times 10^{-14}$ µCi/cc

3. Gamma Radiation. The yearly dose results for the year 1984 as determined from evaluation of site perimeter TLD environmental monitoring dosimeters showed readings within normal background.

4. Vegetation. No alpha, beta, or gamma activity attributabie to activities at the NTR facility was found on or in vegetation in the vicinity of the site.

5. Water. There was no release of radioactivity in water or to the ground water greater than those limits specified in 10CFR20, Appendix B, Table II, Column 2.

6. Off-Site. Samples taken off the site indicate normal background for the area.

VIII. CONCLUSION

The overall operating experience of the Nuclear Test Reactor reflects another year of safe and efficient operations. There were no unusual occurrences or reportable events. Updated equipment and procedures should provide increased reliability in the ensuing years.

GENERAL ELECTRIC COMPANY
Irradiation Processing Operation

By L L Reed
L. L. Reed, Manager
Advanced Nuclear Applications

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NUCLEAR ENERGY BUSINESS OPERATIONS
GENERAL ELECTRIC COMPANY • VALLECITOS NUCLEAR CENTER • PLEASANTON, CALIFORNIA 94566

March 26, 1985

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

Reference: License R-33, Docket 50-73

Dear Dr. Denton:

Enclosed are three signed and forty conformed copies of Annual Report No. 25 for the General Electric Nuclear Test Reactor.

Sincerely,

G. E. Cunningham
Senior Licensing Engineer
(415) 862-2211, Ext. 4330

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