GE Nuclear Energy

General Electric Company
Vallecitos Nuclear Center
P.O. Box 460 Vallecitos Road
Pleasanton, CA 94566

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U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

Reference: License R-33, Docket 50-73

Gentlemen:

Enclosed are three signed copies of Annual Report No. 33 for the General Electric Nuclear Test Reactor.

Sincerely,

G. E. Cunningham
Senior Licensing Engineer
(510) 862-4330

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Enclosures

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GENERAL ELECTRIC

NUCLEAR TEST REACTOR

ANNUAL REPORT NO. 33

LICENSE R-33

DOCKET 50-73

GE Nuclear Energy
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Pleasanton, California

GENERAL ELECTRIC
NUCLEAR TEST REACTOR

ANNUAL REPORT NO. 33

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, 1992, through December 31, 1992.

II. GENERAL

A. The reactor was operated at or above critical for 736.65 hours; 346 startups were made. There were three scrams during this report period. Total plant operation equaled 2.869 MWd in 1992.

B. The average radiation exposure to facility personnel was 1.9 Rem.

C. There were no occurrences during 1992 that required notification of the NRC.

D. There were no notices of violation issued as the result of NRC inspections.

III. ORGANIZATION

G. L. Stimmell replaced R. W. Darmitzel as the Level 3 Manager (Figure 6-1, Technical Specification 6.1).

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

A. Facility Changes

Pursuant to 10CFR50.59(a), the Facility Manager authorized the following facility changes in 1992.

1. Hold-Up Tank Liner

Description: A hold-up tank in the reactor cell is used to accumulate water when the reactor primary coolant system is vented each day. It is an open-top steel tank with a capacity of 500 gallons. A fiberglass liner was installed to provide double-wall leak protection.

Safety Analysis: There are no safety questions with the addition of the liner. Radiation damage and activation are not expected. The consequences of any leak are not increased.

2. Reactor Sump Liner

Description: The reactor sump is a 50-gallon concrete-lined pit in one corner of the reactor cell. A stainless steel liner was installed to provide double-wall protection. A new sump pump and discharge piping also were installed.

Safety Analysis: The liner provides increased protection against potential leaks. The concrete is in excellent condition with no cracks. The consequences of any leak are not increased.

3. Primary System Check Valve Replacement

Description: A check valve in the primary coolant system provides for pressure relief. The original 1-1/2-inch aluminum valve and 16 inches of aluminum piping were replaced with stainless steel components.

Safety Analysis: The new components are rated at higher pressure than the old components. The materials are compatible in the system, and all new joints were leak tested prior to operation of the system.

A. Facility Changes (Continued)

4. Primary Flow Transmitter Relocation

Description: The relocation of the primary flow transmitter was authorized. The new location is in a lower radiation exposure area.

Safety Analysis: The transmitter located in a lower radiation exposure area will be less affected by radiation. The move will be approximately 3 feet and will have no effect on performance. The transmitter will be calibrated and leak tested prior to operation.

B. Tests

Pursuant to 10CFR50.59(a), the Facility Manager authorized the following special test to be performed during 1992.

Cadmium Reactivity Measurement

Description: A piece of cadmium was installed in the horizontal facility to measure the reactivity worth. This was performed in conjunction with other tests to estimate the life of the existing reactor fuel.

Safety Analysis: Cadmium installation and handling were reviewed to assure radiation exposures would be ALARA. It also was determined there would be no adverse effects on reactor operation and shutdown and that all reactivity limits would not be exceeded.

C. Experiments

Pursuant to 10CFR50.59(a), the Facility Manager authorized the following new experiment in 1992.

Depleted Zinc Oxide Irradiation

Description: Milligram samples of zinc oxide and other materials such as sodium chloride, potassium bromide, and lanthanum oxide were approved for irradiation.

Safety Analysis: The irradiation and handling of the sample would not result in radiation exposures exceeding acceptable levels. Effects on reactor operation were determined to be negligible.

D. Procedures

Pursuant to 10CFR50.59(a), there were no procedure changes during 1992 requiring Facility Manager approval.

V. MAJOR PREVENTIVE OR CORRECTIVE MAINTENANCE

Major preventive or corrective maintenance activities performed in 1992 are described in Section IV.A., Facility Changes, above. In addition, the primary coolant pump was replaced because of a seal failure.

VI. UNSCHEDULED SHUTDOWNS

There were three (3) unscheduled shutdowns during this report period. These are summarized below.

A. At a low power level, it was noted that the primary coolant pump "on" light was not illuminated. The pump motor switch was turned. Since the "on" light was burned out and the pump was actually operating, the pump was turned off and caused a reactor low flow scram.

B. A failure of the primary coolant pump seal caused a low flow scram.

C. An intrusion of air in the replaced seal of the primary coolant pump caused a scram during the first reactor run after pump replacement.

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

The data below are from sample and dosimeter results accumulated during 1992. Except for the NTR stack data, these data are for the entire VNC site and include the effects of operations other than the NTR.

A. NTR Stack

Total airborne releases (stack emissions) for 1992 are as follows.

Alpha Particulate, < 0.11 μCi (predominantly radon-thoron daughter products)
Beta-Gamma Particulate, < 0.52 μCi
Iodine-131, 21.7 μCi
Noble Gases, 1.89×10^{2} Ci

Noble gas activities recorded from the NTR stack integrate both background readings and the actual releases. The background readings may account for 40 to 50% of the indicated release.

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

Four environmental air monitoring stations are positioned approximately 90 degrees 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 < 6.6×10^{-15} μCi/cc (predominantly radon-thoron daughter products)
Average < 2.2×10^{-15} μCi/cc

Beta Concentration:

Maximum < 3.2×10^{-14} μCi/cc
Average < 1.7×10^{-14} μCi/cc

C. Gamma Radiation

The yearly dose results for the year 1992 as determined from evaluation of site perimeter TLD environmental monitoring dosimeters showed acceptable levels.

D. Vegetation

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

E. 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.

F. Off-Site

Samples taken off the site indicate normal background for the area.

VIII. RADIATION EXPOSURE

The highest annual dose to NTR Operations personnel was 2.46 Rem, and the lowest was 1.50 Rem. The average dose was 1.92 Rem per person.

IX. CONCLUSIONS

The overall operating experience of the Nuclear Test Reactor reflects another year of safe and efficient operations. There were no reportable events.

GENERAL ELECTRIC COMPANY
Irradiation Processing Operation

By D R Smith
D. R. Smith, Manager
Nuclear Test Reactor