



General Electric Company
Vallecitos Nuclear Center
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Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Annual Report for 2002

Reference: License R-33, Docket 50-73

Gentlemen:

Enclosed are three signed copies of Annual Report No. 43 for the General Electric Nuclear Test Reactor located at Vallecitos Nuclear Center in Sunol, California.

If there are any questions or additional information is required, please contact the undersigned at 925-862-4469

Sincerely,

A handwritten signature in black ink, appearing to read 'C. W. Bassett', with a long, sweeping underline.

C. W. Bassett
Regulatory Compliance and Quality Assurance Support

Enclosures (3)

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GE Nuclear Energy

*Vallecitos Nuclear Center
General Electric Company
Sunol, California*

**GENERAL ELECTRIC
NUCLEAR TEST REACTOR**

**ANNUAL REPORT NO. 43
FOR THE YEAR 2002**

**LICENSE R-33
DOCKET 50-73**

MARCH 2003

General Electric Nuclear Test Reactor

Annual Report No. 43

This report summarizes the operation, changes, tests, experiments, and major maintenance at the General Electric Nuclear Test Reactor (NTR), which were authorized pursuant to License R-33, Docket 50-73, and 10CFR50, Section 50.59, for the period of January 1, 2002 through December 31, 2002.

I. General

Specific information about the operation of the NTR during the reporting period is presented as follows:

1. The reactor was operated at or above critical for 754.05 hours and 247 startups were made. Total operation equaled 3.075 MWd in 2002.
2. The average radiation exposure to regular full-time NTR Operations personnel was 0.85 Rem.
3. There were three reactor scrams.
4. There were no occurrences during 2002 that required notification of the NRC.

II. Organization

The details of changes in the status of personal which occurred during the reporting period are described as follows:

1. Mr. William Kreutel, NTR SRO, became disabled in the 4th quarter of 2002 and ceased Reactor Control panel operating duties. The disability is due to a medical condition and is unrelated to his employment duties or environment. As of year end 2002, Mr. Kreutel was absent from work on formal disability status.
2. Mr. Dennis Smith was re-certified NDT-III and completed the required medical examination for reactivating his NTR SRO status. Mr. Smith will be undergoing the necessary SRO proficiency training, SRO trainee watch standing under the direction and control of an Licensed Senior Reactor Operator, and the testing and biannual requalification program requirements necessary to reactivate his NTR Licensed SRO status. Mr. Smith also continued as a part-time contractor, providing Quality Assurance (QA) consulting, RO examination tutoring, and NDT training services.
3. Mr. Tim Peterson Specialist, NTR, began operational duties governed by his Reactor Operators license. Mr. Peterson continued assisting in Neutron Radiography under the direction and supervision of certified Level I and III NDT personnel and is in training for NDT level I and II certification.
4. Mr. Art Raya continued on the NTR staff as a contract employee to perform NDT neutron radiography tasks under the direction and supervision of the licensed SRO staff and certified Level I and III NDT personnel.
5. Mr. Joe Maggio continued part time on the NTR staff as a contract employee to perform NDT neutron radiography tasks under the direction and supervision of the licensed SRO staff and certified Level I and III NDT personnel.

III. Facility Changes, Tests, Experiments, and Procedure Changes Approved by the Facility Manger

In accordance with written procedures, facility changes, tests, experiments, and procedure changes can only be approved by the Facility Manager. Specific information about the reporting period is presented as follows:

A. Facility Changes

Pursuant to 10CFR50.59(a), there were no facility changes made in 2002 requiring Facility Manager approval. One facility change was approved by the facility manager and Valecitos Site Safety Committee, material staged, but not yet implemented. That change will provide an electrical power link from the site emergency gas fueled generator to the NTR Rod Insert Bus via a "brake-before-make" key-lock manual switch. The change will allow the reactor operator to first disconnect the rod drive bus from the normal commercial power source during an extended commercial power outage, reconnect it to the emergency generator power source and then insert the control rod drives and the safety rod drives. In the event of a loss of commercial power, a scam and a reactor shutdown will occur with safety rod magnet separation and rod insertion. The safety rod drives and the control rods and their drives would remain "as-is" until power became available and the reactor operator is required to standby and monitor the reactor in the interim. This change will allow the reactor operator to "secure" the reactor during an extended commercial power outage.

B. Tests

Pursuant to 10CFR50.59(a), there were no special tests performed during 2002 requiring Facility Manager approval.

C. Experiments

Pursuant to 10CFR50.59(a), there were no new experiments in 2002 requiring Facility Manager approval.

D. Procedure Changes

Pursuant to 10CFR50.59(a), there were procedural changes initiated to incorporate editorial or typographical corrections and technical data or changes to requirements or to provide additional or clarification of information. Changes made during 2002 were made with Facility Manager approval. Details of the changes are presented below:

1. SOPs changes were implemented to reflect the NTR Technical Specifications changes issued by Amendment 21 and 22.
2. An SOP change was made to reflect the 10CFR20 dose limits to an embryo/fetus of a pregnant woman as also reflected in changes to VNC safety standards.
3. An SOP change was made to reflect the use of digital dosimeters in addition to or in lieu of pocket pencil dosimeters.
4. An SOP change was made revising the frequency of formal PM work for the south cell shutter.

IV. Major Preventative or Corrective Maintenance

Routine preventive maintenance and surveillance checks were performed as required and scheduled during the reporting period. There was one overdue quarterly PM on the south cell shutter. A procedural change was incorporated to address a discrepancy between the procedure frequency and the frequency of logging the completion of that PM.

Significant corrective maintenance activity performed during the reporting period consisted of the following:

- The failure of the primary coolant pump seals caused a reactor scram and required a replacement of the pump with a new pump.
- One south shutter frame holddown bolt was found to have sheared off while another vibrated loose. Both were replaced with new bolts. A CA was initiated to modify the south shutter frame anchor points to the building in order to reduce the loads on those bolts.

V. Unscheduled Shutdowns

During the reporting period, there were no unscheduled manual shutdowns. There were three reactor scrams.

A low flow scam occurred during normal reactor operation at full power when the primary pump failed. Subsequent investigation found the pump seal had failed. The primary water loss was minor and limited to a small area of the reactor cell floor in an area around the pump but the loss of pressure was sufficient to degrade flow below the low flow scam setpoint. The reactor cell floor was cleaned and the pump and motor replaced.

A scam also occurred shortly after a reactor startup when Pico # 1 and #3 Instrument flux channels spiked during a voltage transient on the commercial power grid.

A scam occurred during normal reactor operation at full power when facilities personal secured an upstream secondary cooling water supply line while performing PMs on that system and without first informing nor getting approval of the NTR reactor operator. The lost of secondary cooling water resulted in a rapid rise of primary water temperature from normal operating temperature of approximately 125 degrees F to above the scram point of 140 degrees F. A critique of the failure to get prior approval of the valve lineup change in the cooling water supply system from licensed NTR operations personal was held and it was decided to place signs on the subject valves requiring that prior approval before operating the valves and performing maintenance that would cutoff the cooling water. The subject signs are now in place.

No changes in radiation levels nor in the off-gas or particulate levels were noted following any subsequent reactor startups following these scams.

VI. Radiation Levels and Sample Results at On-Site and Off-Site Monitoring Stations

The data below are from sample and dosimeter results accumulated during the reporting period. 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 2002 are as follows:

Alpha Particulate, $5.58\text{E-}08$ Ci (predominantly radon-thoron daughter products)

Beta-Gamma Particulate, $5.69\text{E-}7$ Ci

Iodine-131, $1.02\text{E-}5$ Ci

Noble Gases, $3.58\text{E+}2$ Ci

Noble gas activities recorded from the NTR stack integrate both background readings and the actual releases. Background readings may account for as much as 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, $1.07\text{E-}13$ $\mu\text{Ci/cc}$ (predominantly radon-thoron daughter products)

Average, $5.40\text{E-}15$ $\mu\text{Ci/cc}$

Beta Concentration:

Maximum, $6.86\text{E-}13$ $\mu\text{Ci/cc}$

Average, $2.94\text{E-}14$ $\mu\text{Ci/cc}$

C. Gamma Radiation

The yearly dose results for the year 2002 as determined from evaluation of site perimeter TLD environmental monitoring dosimeters showed no departure from normal stable backgrounds.

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 groundwater greater than the limits specified in 10CFR20, Appendix B, Table 2, Column 2.

F. Off-Site

The results of samples collected from off-site locations indicate normal background for the regional area.

VII. Radiation Exposure

The highest annual dose to full time NTR Operations personnel was 1.14 Rem and the lowest was 0.26 Rem. The average radiation exposure to personnel was 0.85 Rem per person.

VIII. Conclusion

The General Electric Company concludes that the overall operating experience of the NTR reflects another year of safe and efficient operations. There were no reportable events.

GENERAL ELECTRIC COMPANY
Vallecitos and Morris Operations



E.H. Ehrlich, Manager
Nuclear Test Reactor