GE Nuclear Energy

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Via U.S. Mail

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U.S. Nuclear Regulatory Commission
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Subject: Annual Report

Reference: License R-33, Docket 50-73

Gentlemen:

Enclosed are three signed copies of Annual Report No. 42 for the General Electric Nuclear Test Reactor located at Vallecitos Nuclear Center in Sunol, California.

If you have any questions, please contact the undersigned at 925-862-4455.

Sincerely,

Chris Hamilton
Senior Licensing Engineer

Enclosures

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GE Nuclear Energy

Vallecitos Nuclear Center
General Electric Company
Sunol, California

GENERAL ELECTRIC NUCLEAR TEST REACTOR

ANNUAL REPORT NO. 42 FOR THE YEAR 2001

LICENSE R-33
DOCKET 50-73

MARCH 2002

1.0. GENERAL

This report summarizes for the reporting period of January 1, 2001 through December 31, 2001 the operation, changes, tests, experiments, and major maintenance at the General Electric Nuclear Test Reactor (NTR) authorized by License No. R-33, Docket 50-73 and 10CFR50, Section 50.59.

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 743.96 hours and 243 startups were made. Total operation equaled 2.921 MWd in 2001.

2. The average radiation exposure to NTR Operations personnel was 0.675 Rem.

3. There were two reactor scrams.

4. There were no occurrences during 2001 that required notification of the NRC.

5. During June 4-7, 2001 a routine inspection by the NRC occurred. The results of the inspection indicate that no safety concerns or non-compliance were found.

2.0 ORGANIZATION

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

1. Mr. Dennis Smith continued as a part-time contractor providing Quality Assurance (QA) consulting, RO examination tutoring, and NDT training services. Mr. Smith is a certified NDT-III but not actively performing any NDT functions other than training. Mr. Smith is no longer being considered for reactivation of his NTR SRO license.

2. Mr. Tim Peterson Specialist, NTR, completed and passed the operational test and two of the three parts of the written test for his NTR Reactor Operators license in Jan 2001. In November 2001, Mr. Peterson retook the third part of that examination. GE was informed that Mr. Peterson has passed that third part of the examination and his Reactor Operators license would become effective as of December 28, 2001. 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.

3. 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. Mr. Raya passed his radiological controls training for his qualification as a radiation worker and completed formal explosive packaging and labeling safety training.

4. Mr. Joe Maggio 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. Mr. Maggio passed his radiological controls training for his qualification as a radiation worker and completed formal explosive packaging and labeling safety training.

3.0 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:

3.1 Facility Changes

Pursuant to 10CFR50.59(a), there were no facility changes made in 2001 requiring Facility Manager approval. One facility change was under review and staging of material has started but not yet implemented. The change would provide an electrical power link from the site emergency diesel generator to the NTR Rod Insert Bus via a "brake-before-make" key-lock manual switch. The change would allow the reactor operator to first disconnect the rod drive bus from the normal commercial power source during an extended commercial power outage, then connect it to the emergency generator and then insert the control rod drives and the safety rod drives. In the event of a loss of commercial power, a scram 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 would allow the reactor operator to "secure" the reactor during an extended commercial power outage.

3.2 Tests

Pursuant to 10CFR50.59(a), there were no special tests performed during 2001 requiring Facility Manager approval.

3.3 Experiments

Pursuant to 10CFR50.59(a), there were no new experiments in 2001 requiring Facility Manager approval.

3.4 Procedure Changes

Amendments 21 and 22 were issued by the NRC that included revised Technical Specifications for NTR.

Pursuant to 10CFR50.59(a), there were procedural changes initiated to incorporate editorial or typographical corrections and technical data or to provide additional or clarification of information. Changes during 2001 were made with Facility Manager approval. Details of the changes are presented as follows:

1. NTR SOPs changes were drafted to reflect the NTR Technical Specifications changes issued by Amendment 21 and 22. At year-end these Technical Specification change related SOP changes were still under review.

2. An administrative clarification was incorporated through the addition of a new SOP 9.6 Quality Assurance section which summarizes the hierarchy and relationship of quality assurance documents, codes, and standards; the NTR Reactor SOPs; and the NTR Laboratory procedures that apply to the commercial operations that are supported by the reactor.

4.0 MAJOR PREVENTATIVE OR CORRECTIVE MAINTENANCE

Routine preventive maintenance and surveillance checks were performed as required and scheduled during the reporting period. There were no unplanned preventive or corrective maintenance activities performed during the reporting period.

5.0 UNSCHEDULED SHUTDOWNS

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

One scram occurred during a reactor startup and was caused by the operator mistakenly and inadvertently pushing the "Manual Scram" button instead of the "alarm acknowledgement" button in response to the "flow required" alarm that is routinely received at 100 watts and acknowledged during a reactor startup. The manual scram button is directly above the alarm acknowledgement button. The operator was counseled in making positive identification of switches or buttons when taking actions and responding to alarms and indications.

The other scram also occurred during a reactor startup at very low power due to activation of a linear power trip due to noise in a second Pico ammeter power circuit while one of the other pico ammeter power circuits had already also tripped due to circuit noise. The operator did not "bypass" the trip when switching to a higher range on the linear meter as is routine, but not required practice during a startup. The operator was counseled to observe the practice of bypassing the trip during range switching, and resetting trips a soon as practical when allowable. There is an ongoing assessment of the degree and frequency of electronic noise in one or more pico ammeter power circuits at low power levels to determine the need, type, and timing of preventative maintenance actions that could be implemented.

6.0 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.

6.1 NTR Stack

Total airborne releases (stack emissions) from the NTR stack for 2001 are as follows:

Alpha Particulate, 4.30E-05 Ci (predominantly radon-thoron daughter products)
Beta-Gamma Particulate, 8.80E-4 Ci
Iodine-131, 1.08E+1 Ci
Noble Gases, 3.38E+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.

6.2 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, 1.69E-13 μCi/cc (predominantly radon-thoron daughter products)
Average, 3.39E-14 μCi/cc

Beta Concentration:
Maximum, 4.68E-13 μCi/cc
Average, 6.54E-14 μCi/cc

6.3 Gamma Radiation

The yearly dose results for the year 2001 as determined from evaluation of site perimeter TLD environmental monitoring dosimeters showed no departure from normal stable backgrounds.

6.4 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.

6.5 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.

6.6 Off-Site

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

7.0 EXPOSURE DATA

The highest annual dose to NTR Operations personnel was 1.355 Rem and the lowest was 0.025 Rem. The average radiation exposure to personnel was 0.675 Rem per person.

8.0 CONCLUSION

In conclusion, there were no reportable events during 2001. The General Electric Company concludes that the overall operating experience of the NTR reflects another year of safe and efficient operations.

GENERAL ELECTRIC COMPANY
Vallecitos Nuclear Center

Edward H Ehrlich

E.H. Ehrlich, Manager
Nuclear Test Reactor