

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT

REGION V.

Report No. 50-70/80-01

License No. 50-70 Priority TR-1 Category \_\_\_\_\_

Licensee: General Electric Company  
Vallecitos Nuclear Center  
P. O. Box 460, Pleasanton, California 94566

Facility Name: General Electric Test Reactor (GETR)

Inspection at: Pleasanton, California

Inspection conducted: February 25-26, 28-29 and March 5-6, 1980

Inspectors: R. F. Fish 4/24/80  
R. F. Fish, Radiation Specialist Date Signed

R. F. Fish for 4/24/80  
F. A. Wenslawski, Chief, Reactor Radiation Section Date Signed

Approved by: H. E. Bock 4/24/80  
H. E. Bock, Chief, Fuel Facility and Materials Safety Branch Date Signed

Summary:

Inspection on February 25-26, 28-29 and March 5-6, 1980 (Report No. 50-70/80-01)

Areas Inspected: Routine, unannounced inspection of organization, surveys, personnel exposures, tour of facility, independent survey of tritium in ground water near GETR. The inspection involved 20 hours of on site time by one (1) inspector.

Results: No items of noncompliance or deviations were identified.

## DETAILS

### 1. Persons Contacted

- \*P. Kachel, Manager, GETR Operations
- W. Springsteen, Supervisor, GETR Planning and Materials
- E. Hagberg, Shift Supervisor
- \*P. Webb, Manager, Radiological and Environmental Protection
- R. Broz, Specialist, Radiation Emergency Planning
- C. Hooker, Supervisor, Radiological Protection
- J. Reck, Radiation Monitor
- \*E. Strain, Nuclear Safety Engineer

\*Denotes those attending the exit interview.

### 2. Organization

GETR is still being manned on a three shift, 7 days a week basis. The shift crew consists of a shift supervisor, an operator and a radiation monitor. During the hours of 4:00 PM - 8:00 AM Monday-Friday and weekends the GETR monitor is the only radiation safety person normally onsite. The reactor remains shutdown and only routine surveillance and a little maintenance activities have been performed. The Radiological and Environmental Protection group has not changed significantly since the May 1978 inspection; however, there have been some changes in personnel.

No items of noncompliance or deviations were identified.

### 3. Surveys

The survey program has not changed significantly since the May 1978 inspection (see paragraph 7 of IE Inspection Report No. 50-70/78-C5). The program consists of routine and special surveys involving direct radiation measurements and smears to detect removable contamination. Continuous air and iodine monitors continue to be operated 24 hours per day inside the GETR containment building.

Records of survey results for the period August 1979 through February 15, 1980 were examined on a random basis. Earlier survey records had already been placed in storage. According to the records clean areas showed removable contamination levels were generally less than 100 cpm/100 cm<sup>2</sup> beta-gamma and less than 200 dpm/100 cm<sup>2</sup> alpha. Some smear results showed several thousand cpm (i.e. 8,000, speck of 50,000); however, the record also showed the results of smears taken after the area(s) was cleaned. According to the records radiation levels in most of the clean areas of the containment building were less than 1 mR/hr. All of the elevated radiation levels, those above about 20 mR/hr were within the controlled areas of the containment building. The only changes in the radiation levels since the May 1978 inspection were reductions due primarily due to decay. Air particulate concentrations inside the containment building were in the ranges of  $<0.3-21 \times 10^{-14}$  and  $0.4-9.5 \times 10^{-13}$  uCi/cc for alpha and beta activity respectively.

No items of noncompliance or deviations were identified.

4. Personnel Exposures

There have been no changes in the personnel monitoring program since the May 1978 inspection (see paragraph 6 of IE Inspection Report No. 50-70/78-05). According to the records the following exposures were received by GETR assigned personnel during the years 1978 and 1979.

<u>Monthly Change</u>	<u>1978</u>	<u>1979</u>
Annual Whole Body Exposure (Max.)	2.980 rem	1.415 rem
Quarterly Whole Body Exposure (Max.)	1.195 rem	0.570 rem

Quarterly Change

Annual Whole Body Exposure (Max.)	4.125 rem	0.085 rem
Quarterly Whole Body Exposure (Max.)	1.690 rem*	-

\*Exposure history obtained prior to exposure above 1.25 rem in a quarter.

The routine whole body counts showed all depositions were less than 1 percent of a maximum permissible body burden.

No items of noncompliance or deviations were identified.

5. Tour of Facility

The inspection included a tour of the GETR facility. The tour included observing general conditions, posting of areas and the control of high radiation areas. Area postings and container labeling were found to be in accordance with 10 CFR 20.203 (b), (c) (1), (e) and (f). The facility was clean looking and no operations were in progress.

No items of noncompliance or deviations were identified.

6. Independent Survey

During the tour of the facility the inspector surveyed various areas inside the containment building and several other locations. The radiation levels were measured with the Region V beta-gamma survey meter, serial No. NRC 377, that was calibrated on February 18, 1980. Within the controlled area on the first floor the following levels were found: general area-5 mR/hr, drain in floor-35 mR/hr, spot on floor near drain-10 mR/hr, near door to equipment room - <1 mR/hr. Radiation levels at the barrier around the basement controlled area varied over the range of 3.5 - 35 mR/hr. The surface reading of a storage cabinet on the second floor read 60 mR/hr. A drain on the second floor read about 35 mR/hr. The radiation level at the barrier around the controlled area on the third floor varied over the range of 0.5 to 5 mR/hr. Radiation levels at the barrier around the tank farm area were a maximum of 10-20 mR/hr. At the

time of the tour an additional area around a part of the tank farm had been temporarily barricaded while a mobile tank, used to transport liquid waste to the waste evaporator, was being filled. Radiation levels at the temporary barrier were less than 1 mR/hr. No other significant radiation levels in the area around the containment building were detected. Several smears were taken inside the containment building and outside at the entrance to the containment building. With the exception of two, all smears showed less than 120 dpm/100 cm<sup>2</sup>. The two smears taken inside the first floor controlled area showed about 250 and 10,500 dpm/100 cm<sup>2</sup>. The higher result was a smear taken near the entrance to the equipment room which is a high radiation area. The smears were counted with the Region V NMC Model PC-55 proportional counter.

7. Tritium in Ground Water Near GETR

On March 27, 1980 the licensee informed the inspector that elevated tritium concentrations had been found in water samples taken from a well located just west of the GETR control (office) building and south of the tank farm. The first such sample was collected January 23, 1980. Subsequent samples were collected on January 28 and 30. These samples showed  $2.4 \times 10^{-5}$ ,  $2.6 \times 10^{-5}$  and  $2.7 \times 10^{-5}$  uCi/ml respectively. A water sample taken from a pit located just east of the containment building showed less than the minimum detectable ( $4 \times 10^{-6}$  uCi/ml) concentration of tritium. According to the licensee the well sample was taken as the result of the California Regional Water Quality Control Board staff inquiring about the possibility of collecting ground water samples around the GETR facility to test for tritium.

The licensee believes the source of the elevated tritium concentrations was leakage from piping associated with transfer of primary water between the containment building (reactor) and the tank farm area. This piping was underground until 1973 when all but a short run between a shutoff valve and the containment building was placed above ground. The first piping leak, in the recirculating line on the fill and flush pumps, was detected in 1965. Another part of this piping leaked in 1970. A third leak was detected in the discharge line from these pumps in 1973, prior to moving the piping above ground.

To confirm the current leakage integrity of the tank farm the licensee started leak testing the tanks and associated piping. At the time of the inspection testing had started on one of the three underground liquid storage tanks (volume 25,000 gallons each). A resin hold tank is also located underground in the same location. After testing the tanks, the piping will be tested.

According to the licensee there is a collection sump beneath the underground tanks. Water in the sump can be pumped to the radwaste system. The licensee said that during periods of rain this sump has overflowed. Seven water samples were collected from this sump during this period. The analyses of these samples showed tritium concentrations in the range of  $5.0$ - $6.4 \times 10^{-3}$  uCi/ml. No alpha or beta activity above the minimum detectable limit ( $3$ - $3 \times 10^{-8}$  and  $5$ - $5 \times 10^{-8}$  respectively) was detected.

On February 29, 1980 the NRC collected water samples from (1) the well west of the control building, (2) the diesel tank well, and (3) the discharge of a basin being released to Vallecitos Creek. Attachment 1 shows the locations of the well west of the control building (designated B-2), the diesel tank well and the pit east of the containment building. The well (B-2) is about 70 feet deep with a one-inch PVC pipe that has been slotted below a depth of 30 feet. This well, which was drilled in connection with a geologic investigation, was backfilled with clean gravel to a depth of 19 feet. At the time of the sample collection the licensee determined the water level was at about 23 feet from the surface. The diesel tank well, used for detecting leakage from the tank of diesel fuel, was measured and found to be about 117 inches deep with the top of the water at about 99 inches. The licensee collected duplicates of the three samples.

The results of the analyses of the samples collected on February 29 were as follows:

<u>Sample</u>		<u>NRC Lab</u> (uCi/ml)	<u>Licensee</u> (uCi/ml)
Well Sample (B-2)	H-3	$4.73 \pm 0.06 \times 10^{-5}$	$3.9 \pm 0.7 \times 10^{-5}$
	Alpha	$1.04 \pm 0.08 \times 10^{-8} *$	$< 3 \pm 3 \times 10^{-8}$
	Gamma Scan Cs-137	$3 \pm 8 \times 10^{-9}$	Maybe RA-226
Diesel Tank Well Sample	H-3	$1.22 \pm 0.04 \times 10^{-5}$	$1.4 \pm 0.4 \times 10^{-5}$
	Alpha	$4.5 \pm 0.5 \times 10^{-9} *$	$< 3 \pm 3 \times 10^{-8}$
	Gamma Scan CS-137	$2.3 \pm 0.7 \times 10^{-8}$	Trace of Cesium-137
Discharge Water Sample	H-3	$14 \pm 2 \times 10^{-7}$	$< 4 \pm 4 \times 10^{-6}$
	Alpha	$3.8 \pm 0.3 \times 10^{-9} *$	$< 3 \pm 3 \times 10^{-8}$
	Gamma Scan		No gamma detected**
	TI-208	$3.9 \pm 1.4 \times 10^{-8}$	
	Cs-137	$2 \pm 0.7 \times 10^{-8}$	
	Pb-212	$2.8 \pm 1.4 \times 10^{-8}$	

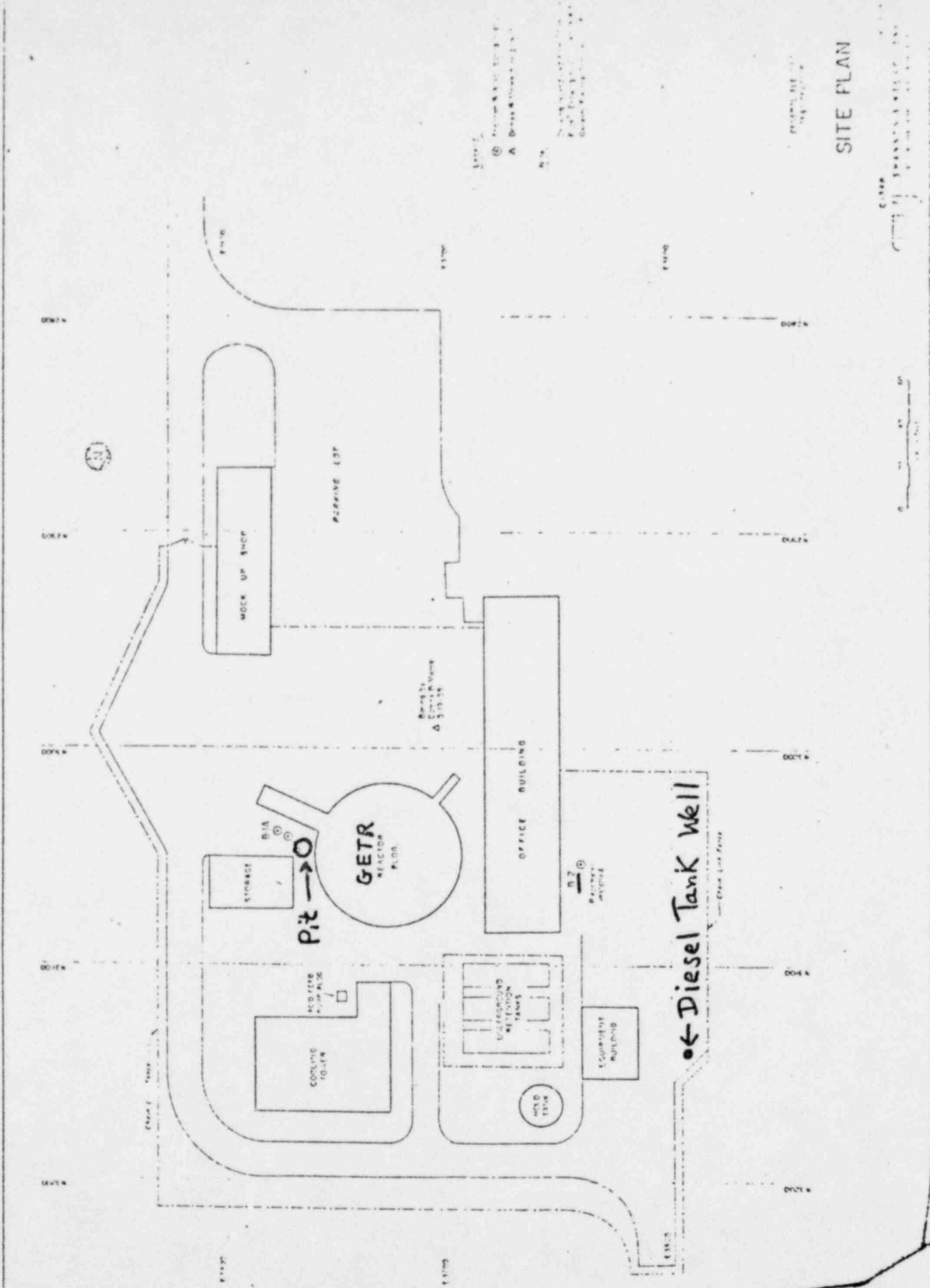
\*Does not include a systematic error of  $\pm 25\%$ .

\*\*Co-60 and Cs-137 detection limit is  $2 \times 10^{-6}$  uCi/ml when counting a one liter sample for 10 minutes.

During the period February 15 through March 5, 1980 the licensee obtained 16 additional samples from the well west of the control building (b-2). The results of the analyses of these samples showed no alpha or beta activity above the minimum detectable limit and tritium concentrations varied over the range of  $2.4 - 5.2 \times 10^{-5}$  uCi/ml. The maximum tritium concentration permitted in effluents released to unrestricted areas, per 10 CFR 20.106, is  $3 \times 10^{-3}$  uCi/ml.

8. Exit Interview

On March 19, 1980 the inspector met with the following licensee personnel: R. Darmitzel, Manager of IPP Section; D. Smith, Acting Analyst; those so designated in paragraph 1 of this report. The scope of the inspection and the findings were discussed. The licensee was informed there were no apparent items of noncompliance or deviations. The results of the inquiry into the elevated tritium concentrations in water from the well west of the GETR control building and the NRC analyses of water samples collected on February 29, 1980 were discussed. The inspector requested that he be informed of the tank and pipe leak testing results when the testing has been completed.



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SITE PLAN

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Attachment 1