



HITACHI

GE Hitachi Nuclear Energy

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October 26, 2016

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555-001

Subject: GEH Annual Shutdown Reactor Report for 2016 – GETR Revision 1

References: 1) Docket 50-70 (GETR)
2) Letter T. A. Caine to NRC Document Control Desk, "GEH Annual Shutdown
Reactor Reports for 2016, 3/22/16

Enclosed is a revised 2016 Annual Report for the deactivated General Electric Test Reactor (GETR) located at the GE Hitachi, Vallecitos Nuclear Center near Sunol, California.

If there are any questions or additional information required, please contact me at the number above.

Sincerely,

Tom Caine, Manager
Vallecitos Nuclear Center

Enclosure: GETR Annual Report No. 57, Revision 1

Commitments: None

cc: NRC Region IV Administrator
J. Parrott, NRC NMSS



HITACHI

GE-HITACHI NUCLEAR ENERGY

*Vallecitos Nuclear Center
Sunol, California*

**GENERAL ELECTRIC TEST REACTOR
(DEACTIVATED)**

**ANNUAL REPORT NO. 57
FOR THE YEAR 2015**

**LICENSE TR-1
DOCKET 50-70**

**REVISION 1
OCTOBER 2016**

General Electric Test Reactor (Deactivated)

ANNUAL REPORT NO. 57

GE Hitachi (GEH) has maintained the General Electric Test Reactor (GETR) in a deactivated status under the authority of Amendment No. 17 to License TR-1, Docket 50-70, issued October 22, 2007. In this annual report, a summary of the status of the facility for the period of January 1, 2015 to December 31, 2015 is presented.

1.0 SUMMARY

The facility remains in essentially the same condition described in Annual Report No. 54. Entry into the reactor building was made for routine radiation surveys and a general examination of conditions throughout the building. The crane, elevator, and ventilation were serviced and tested in 2011 in anticipation of beginning remediation activities. Such activities have not begun.

Radiation and contamination levels remain at acceptable levels.

2.0 STATUS OF FACILITY

In accordance with written procedures, the Facility Manager controls access to the containment building and general systems. The facility continues to be in deactivated status. There were no changes authorized by the Facility Manager pursuant to 10CFR50.59(a) in 2015.

3.0 RADIATION AND CONTAMINATION

Complete radiation and contamination surveys of the facility indicate that levels remain low. Results of the surveys are presented in attachment 1. Air sampling results are presented in attachment 2. The radiation/contamination levels listed are representative but not necessarily maximum values.

The data below are from sample and dosimeter results accumulated during 2015. These data are for the entire VNC site and include the effects of operations other than GETR.

3.1 GETR Stack

Although maintenance was performed on the stack in 2011, and the stack was tested, there has been no remediation effort performed for the GETR reactor. The ventilation system is operational, and the stack air flow has been calibrated.

Alpha Concentration $1.11 \times 10^{-15} \mu\text{Ci/cc}$

Beta Concentration $3.09 \times 10^{-15} \mu\text{Ci/cc}$

3.2 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 that is changed weekly and analyzed for gross alpha and gross beta-gamma.

Alpha Concentration:

Weekly Maximum, $7.93 \times 10^{-15} \mu\text{Ci/cc}$

Weekly Average, $1.36 \times 10^{-15} \mu\text{Ci/cc}$

Beta Concentration:

Weekly Maximum, $6.58 \times 10^{-14} \mu\text{Ci/cc}$

Weekly Average, $1.49 \times 10^{-14} \mu\text{Ci/cc}$

3.3 Gamma Radiation

The yearly dose results for the year 2015 as determined from evaluation of site perimeter environmental monitoring dosimeters showed no departure from normal stable backgrounds.

3.4 Vegetation

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

3.5 Off-Site

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

4.0 ACTIVITIES

Routine inspections were conducted during this report period. There were no preventive or corrective maintenance activities performed having safety significance during the reporting period.

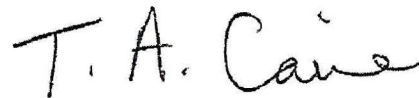
5.0 ORGANIZATION

The organizational structure remained unchanged during 2015. The Site Manager remains T. A. Caine. The VBWR Facility Manager remains M. R. Schrag. The Manager, Regulatory Compliance and EHS remains T. M. Leik.

6.0 CONCLUSION

GE Hitachi Nuclear Energy concludes that the deactivated GETR is being maintained in a safe shutdown condition. The inspections, access control, and administratively controlled activities ensure maximum protection for the public health and safety. The procedures will be continued to maintain this high level of protection.

GE Hitachi Nuclear Energy
Vallecitos Operations



T. A. Caine
Manager Vallecitos Nuclear Center

**HITACHI**

VALLECITOS NUCLEAR CENTER

NUCLEAR SAFETY SURVEY RECORD

| | | | |
|---|--|-------------------|---------------|
| SURVEYOR (print and sign) Name and signature on original at GEH Vallecitos | | REVIEWER | NO. C-017 |
| LOCATION 200 Area GETR Containment (page 1 of 2) | | DATE: 11/14/15 | TIME: 1300 |

| <input checked="" type="checkbox"/> Routine <input type="checkbox"/> Special | | REASON Annual Survey | | | | | | | | | | | | | |
|---|---------------------------------------|-------------------------|------------------|-------------|-----------------|------------|--------------------------|----------------------|-----------------|-----------------|---------------------------|----------------------|-----------------|-----------------|---------------------|
| ITEMS OR LOCATION | | DOSE RATE | | | | | DIRECT READING | | | | SMEAR READINGS | | | | |
| Item No. | | β mRad/h | γ mR/h | n mRem/h | TOTAL mRem/h | Distance | $\beta\gamma$ CPM | $\beta\gamma$ dPM | α CPM | α dPM | $\beta\gamma$ CPM | $\beta\gamma$ dPM | α CPM | α dPM | AREA |
| 1 | Personnel Air Lock | | <0.5 | | <0.5 | F | | | | | <100 | <500 | <20 | <200 | 100 cm ² |
| 2 | Equipment Air Lock | | <0.5 | | <0.5 | F | | | | | <100 | <500 | <20 | <200 | 100 cm ² |
| 3 | Personnel Air Lock SOP | | | | | | | | | | <100 | <500 | <20 | <200 | 100 cm ² |
| 4 | 1st Floor - Clean Area * | | <1 | | <1 | F | | | | | <100 | <500 | <20 | <200 | 100 cm ² |
| 5 | - Zone Area * | | <1-8 | | <1-8 | F | | | | | 300 | 1500 | <20 | <200 | 100 cm ² |
| 6 | 2nd Floor - General Dose Rate | | <1-2 | | <1-2 | F | | | | | | | | | |
| 7 | - EEHS Cubicle Door | | 7 | | 7 | C | | | | | | | | | |
| 8 | - Field Reading Around EEHS Cubicle | | 1.5-5 | | 1.5-5 | F | | | | | | | | | |
| 9 | - Floor Smear / Clean Area * | | | | | | | | | | <100 | <500 | <20 | <200 | 100 cm ² |
| 10 | - Filter Bank | | <1 | | <1 | C | | | | | | | | | |
| 11 | 3rd Floor - Zone Area North / Floor * | | <1-4 | | <1-4 | F | | | | | 2200 | 11000 | <20 | <200 | 100 cm ² |
| 12 | - Zone Area South | | <1 | | <1 | F | | | | | <100 | <500 | <20 | <200 | 100 cm ² |
| 13 | - Bridge / Canal | | 1.5 | | 1.5 | F | | | | | 200 | 1000 | <20 | <200 | 100 cm ² |
| 14 | - Missile Shield Point A * | | <1 | | <1 | F | | | | | <100 | <500 | <20 | <200 | 100 cm ² |
| 15 | - Platform | | <0.5 | | <0.5 | F | | | | | <100 | <500 | <20 | <200 | 100 cm ² |
| 16 | - Clean Area * | | <0.5 | | <0.5 | F | | | | | <100 | <500 | <20 | <200 | 100 cm ² |
| INSTRUMENT USED | | PRM - 7 | CP - 5 | RO - 20 | PNR - 4 | TBM - | E - 120 | RM - | RM - | | PAC - 1SA | LUDLUM-12 | | | |
| SERIAL NUMBER | | | | 285 | | | 1339 | | | | 897 | | | | |
| Area Posted: (circle applicable) RA HRA CA RMA AIRBORNE | | | | | | PROBE | α AC - 3A (U) 10% | | X | PROBE | $\beta\gamma$ PANCAKE 20% | | X | | |
| COMMENTS * Whatman Smears | | | | | | EFF. | α 43 - 4 (U) 10% | | | EFF. | | | | | |
| | | | | | | (4 P GEO.) | | | | (4 P GEO.) | | | | | |
| | | | | | | | | | | | | | | | |

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VALLECITOS NUCLEAR CENTER

NUCLEAR SAFETY SURVEY RECORD

| | | | |
|--|--|----------------|-------|
| SURVEYOR (print and sign) | | REVIEWER | NO. |
| Name and signature on original at GEH Vallecitos | | | C-017 |
| LOCATION | | DATE: 11/14/15 | |
| 200 Area GETR Containment (page 2 of 2) | | TIME: 1300 | |

| <input checked="" type="checkbox"/> Routine <input type="checkbox"/> Special | | REASON Annual Survey | | | | | | | | | | | | | |
|---|--|--------------------------------|------------------|-------------|-----------------|----------|--------------------------|----------------------|-----------------|-----------------|---------------------------|----------------------|-----------------|-----------------|---------------------|
| ITEMS OR LOCATION | | DOSE RATE | | | | | DIRECT READING | | | | SMEAR READINGS | | | | |
| Item No. | | β mRad/h | γ mR/h | n mRem/h | TOTAL mRem/h | Distance | $\beta\gamma$ CPM | $\beta\gamma$ dPM | α CPM | α dPM | $\beta\gamma$ CPM | $\beta\gamma$ dPM | α CPM | α dPM | AREA |
| 1 | 3rd Floor - Zone Area Floor Drain | 40 | 6 | | 46 | C | | | | | | | | | |
| 2 | Elevator | | <0.5 | | <0.5 | F | | | | | <100 | <500 | <20 | <200 | 100 cm ² |
| 3 | Basement - Clean Area * | | <1-3 | | <1-3 | F | | | | | <100 | <500 | <20 | <200 | 100 cm ² |
| 4 | - Filter Bank | | 1 | | 1 | F | | | | | | | | | |
| 5 | - Zone Area * | | <1-5 | | <1-5 | F | | | | | 100 | 500 | <20 | <200 | 100 cm ² |
| 6 | - Control Rod Storage | | 1.0-50 | | 1.0-50 | C | | | | | | | | | |
| 7 | - Control Rod Repair Hood | | <1-3 | | <1-3 | F-C | | | | | | | | | |
| 8 | - Autoclave / Rad Work Area | | <1 | | <1 | C | | | | | | | | | |
| 9 | Mezzanine between 2 nd & 3 rd Floors | | <0.5 | | <0.5 | F | | | | | <100 | <500 | <20 | <200 | 100 cm ² |
| 10 | | | | | | | | | | | | | | | |
| 11 | First Floor Zone - hot spot on floor** | 180 | 70 | | 250 | C | | | | | 20000 | 100000 | <20 | <200 | 100 cm ² |
| 12 | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | |
| INSTRUMENT USED | | | PRM - 7 | CP - 5 | RO - 20 | PNR - 4 | TBM - | E - 120 | RM - | RM - | PAC - 1SA | LUDLUM-12 | | | |
| SERIAL NUMBER | | | | | 285 | | | 1339 | | | 897 | | | | |
| Area Posted: (circle applicable) RA HRA CA RMA AIRBORNE | | | | | | PROBE | α AC - 3A (U) 10% | | X | PROBE | $\beta\gamma$ PANCAKE 20% | | X | | |
| COMMENTS * Whatman Smears ** Gamma Spectroscopy indicates this is Cs-137 | | | | | | EFF. | α 43 - 4 (U) 10% | | | EFF. | | | | | |
| | | | | | | (4 P | | | | (4 P | | | | | |
| | | | | | | GEO.) | | | | GEO.) | | | | | |

ATTACHMENT 2: Air Sample Data for Vallecitos Reactor Annual Inspection 2015

| Reactor | Location | Sample Volume (ml) | Initial | | | | 1 Hour Decay | | | | 48 Hour Decay * | | | |
|---------|-------------|-----------------------|---------|----------|----------|----------|--------------|----------|---------|----------|-----------------|----------|--------|----------|
| | | | Alpha | | Beta | | Alpha | | Beta | | Alpha | | Beta | |
| | | | ncpm | uCi/ml | ncpm | uCi/ml | ncpm | uCi/ml | ncpm | uCi/ml | ncpm | uCi/ml | ncpm | uCi/ml |
| VBWR | First Floor | 2.83E+06 | 2210.45 | 1.02E-09 | 5887.16 | 2.73E-09 | 978.99 | 4.50E-10 | 352.75 | 1.62E-10 | 0.27 | 1.24E-13 | 179.69 | 8.33E-11 |
| | Basement | 2.83E+06 | 2039.96 | 9.38E-10 | 5281.56 | 2.45E-09 | 639.56 | 2.94E-10 | 1373.31 | 6.32E-10 | 0.70 | 3.22E-13 | 21.14 | 9.80E-12 |
| | Fuel Pool | 2.83E+06 | 2067.26 | 9.51E-10 | 5297.21 | 2.46E-09 | 1096.67 | 5.04E-10 | 2440.18 | 1.12E-09 | 0.90 | 4.14E-13 | 9.42 | 4.37E-12 |
| EVESR | First Floor | 2.83E+06 | 5163.65 | 2.38E-09 | 14342.86 | 6.65E-09 | 3180.74 | 1.46E-09 | 7079.93 | 3.26E-09 | 0.60 | 2.76E-13 | 1.15 | 5.33E-13 |
| | Basement | 2.83E+06 | 6219.82 | 2.86E-09 | 16754.30 | 7.77E-09 | 2553.03 | 1.17E-09 | 5429.47 | 2.50E-09 | 0.40 | 1.84E-13 | 14.87 | 6.89E-12 |
| | 519' Level | 2.83E+06 | 6213.91 | 2.86E-09 | 16797.99 | 7.79E-09 | 3347.47 | 1.54E-09 | 7481.06 | 3.44E-09 | 0.80 | 3.68E-13 | 4.33 | 2.01E-12 |
| GETR | First Floor | 2.83E+06 | 971.07 | 4.47E-10 | 2391.69 | 1.11E-09 | 452.53 | 2.08E-10 | 965.12 | 4.44E-10 | 0.20 | 9.20E-14 | 5.40 | 2.50E-12 |
| | Basement | 2.83E+06 | 937.69 | 4.31E-10 | 2319.45 | 1.08E-09 | 464.01 | 2.13E-10 | 1041.09 | 4.79E-10 | 0.30 | 1.38E-13 | 3.19 | 1.48E-12 |
| | Third Floor | 2.83E+06 | 808.45 | 3.72E-10 | 1955.49 | 9.06E-10 | 65.78 | 3.03E-11 | 131.32 | 6.04E-11 | 0.50 | 2.30E-13 | 14.26 | 6.61E-12 |

Tennelec System "A" Efficiency & Conversion Factors

| | |
|------------------|----------|
| Alpha Efficiency | 34.58% |
| Beta Efficiency | 34.32% |
| dpm/uCi | 2.22E+06 |
| Alpha cpm/uCi | 7.68E+05 |
| Beta cpm/uCi | 7.62E+05 |

* Note: Lack of P10 gas prevented 24 hour count.

| Sampling Information | | | | | | | | | |
|----------------------|-------------|--------------|---------|----------|--------------------|-----------------------|----------------------------------|--------------------|-----------------------------|
| Reactor | Location | Date Sampled | Time On | Time Off | Minutes sampled | Flow Rate (cfm) | Total Flow (ft ³) | ml/ft ³ | Total Sample Volume (ml) |
| VBWR | First Floor | 11/14/2015 | 7:00 | 7:20 | 20 | 5 | 100.0 | 28317 | 2.83E+06 |
| VBWR | Basement | 11/14/2015 | 7:40 | 8:00 | 20 | 5 | 100.0 | 28317 | 2.83E+06 |
| VBWR | Fuel Pool | 11/14/2015 | 7:20 | 7:40 | 20 | 5 | 100.0 | 28317 | 2.83E+06 |
| EVESR | First Floor | 11/14/2015 | 8:35 | 8:55 | 20 | 5 | 100.0 | 28317 | 2.83E+06 |
| EVESR | Basement | 11/14/2015 | 9:25 | 9:45 | 20 | 5 | 100.0 | 28317 | 2.83E+06 |
| EVESR | 519' Level | 11/14/2015 | 9:00 | 9:20 | 20 | 5 | 100.0 | 28317 | 2.83E+06 |
| GETR | First Floor | 11/14/2015 | 11:35 | 11:55 | 20 | 5 | 100.0 | 28317 | 2.83E+06 |
| GETR | Basement | 11/14/2015 | 12:00 | 12:20 | 20 | 5 | 100.0 | 28317 | 2.83E+06 |
| GETR | Third Floor | 11/14/2015 | 12:25 | 12:45 | 20 | 5 | 100.0 | 28317 | 2.83E+06 |