

GENERAL ELECTRIC

NUCLEAR ENERGY
ENGINEERING
DIVISION

GENERAL ELECTRIC COMPANY, P.O. BOX 460, PLEASANTON, CALIFORNIA 94566

August 6, 1980

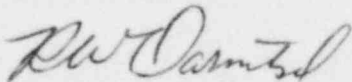
Mr. Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Calculated 50 Year Organ Doses at the Vallecitos Nuclear Center
Site Boundary from 100% Release of the Isotopes in the General
Electric Test Reactor (GETR) Pool, Canal and Primary Water -
License TR-1 - Docket 50-70

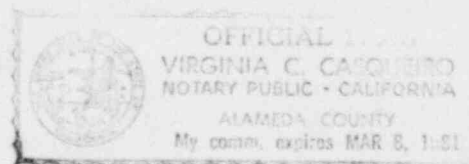
Dear Mr. Clark:

In answer to a question raised at our meeting of July 30, 1980 with the NRC Staff, the attached calculation of the dose rate resulting from the evaporation of the water from the GETR following a postulated seismic event is given. No credit was taken for the containment following the seismic event. The results of these calculations show that the dose caused by the release of these waters is well below those permitted during normal operation.

Very truly yours,



R. W. Darmitzel, Manager
Irradiation Processing Operation



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attachment

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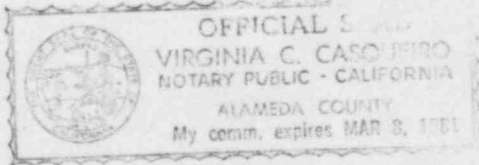
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AFFIRMATION

The General Electric Company hereby submits the information pertaining to the offsite dose resulting from the evaporation of the General Electric Test Reactor (GETR) water.

To the best of my knowledge and belief, the information contained herein is accurate.



R. W. Darmitzel

R. W. Darmitzel, Manager
Irradiation Processing Operation

Submitted and sworn before me this 6th day of August, 1980,

Virginia Casquero, Notary Public in and for the
County of Alameda, State of California.

VALLECITOS NUCLEAR CENTER
Pleasanton, California

August 5, 1980

To: W. H. King

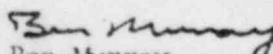
SUBJECT: CALCULATED 50 YEAR ORGAN DOSES AT THE VNC SITE BOUNDARY FROM
100% RELEASE OF THE ISOTOPES IN GETR POOL, CANAL, AND PRIMARY
WATER

The boundary organ doses were calculated for the conservative release of the 20 isotopes identified in Table 1. These isotopes and quantities have been identified through testing of the GETR plant waters during normal operation. The worst case dose based on an assumed release of the entire inventory was less than one percent of the dose limits for members of the general public, given in ICRP-9¹.

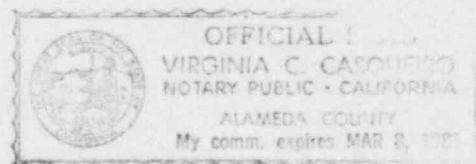
The 50 year dose commitments to various organs from exposure to a 2 hour release of the isotopes, in Table 1, were calculated with DOSE77, a General Electric version of DACRIN. The input parameters used, besides the isotope inventory are:

- Distance from GETR to the nearest site boundary = 768 m
- Meteorological stability = Pasquill Type F
- Wind Speed = 1 m/s
- Particle Size = 1 micron
- Breathing Rate = 347 cc/s
- Release and exposure time = 2 hours
- Release Height = Ground Release
- Isotope Solubility Form = Soluble

The 50 year organ doses are given in Table 2. Over 90% of the total body dose is due to six of the isotopes. These isotopes are: Cc-60, Na-24, Cs-137, Zr-95, Ce-144, and Sb-124. Because of the relatively low volatility of these isotopes, it can be concluded that the actual insult to the public from evaporation of the GETR water would be very insignificant.


Ben Murray
Nuclear Safety Technology

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¹Recommendations of the International Commission on Radiological Protection, ICRP Publication 9.

TABLE 1. TOTAL CURIE LEVELS IN GETR WATERS
DURING NORMAL OPERATIONS

<u>Nuclide</u>	<u>T_{1/2}, yrs.</u>	<u>Primary-Pool- Canal Curies</u>
C-14	5.73E+3	1.318E-3
Cs-137	3E+1	8.78E-2
H-3	1.226E+1	1.743E0
Co-60	5.27E0	4.043E-1
Cs-134	2.10E0	7.33E-3
Mn-54	8.3E-1	4.20E-3
Ce-144	7.81E-1	3.20E-2
Zr-95	1.78E-1	3.30E-2
Sb-124	1.65E-1	4.05E-2
Ru-103	1.10E-1	7.00E-3
Nb-95	9.59E-2	4.61E-2
Ce-141	8.90E-2	4.20E-3
Cr-51	7.62E-2	2.68E-2
Sb-122	7.67E-3	1.41E-2
W-187	2.74E-3	3.54E-2
Na-24	1.71E-3	9.26E-1
Xe-135	1.05E-3	4.12E-3
Sr-92	3.08E-4	2.72E-2
Mn-56	2.95E-4	4.68E-3
Ar-41	2.09E-4	1.95E-1

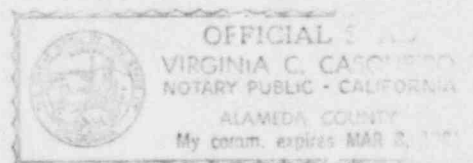


TABLE 2. 50 YEAR ORGAN DOSES AT SITE BOUNDARY FOR
RELEASE OF ISOTOPES IN GETR WATERS

<u>Organ</u>	<u>50 Year Dose, Rem</u>
Total Body	
Inhalation	3.55E-3
Submersion	1.31E-3
Kidneys	3.47E-3
Liver	6.76E-3
Bone	1.01E-2
Lungs	1.16E-2
Thyroid	1.02E-4
Stomach	4.39E-4
Small Intestine	8.88E-4
Upper Large Intestine	7.76E-4
Lower Large Intestine	2.70E-3
Skin, Submersion	1.70E-3

