GENERAL ELECTRIC

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SPACE DIVISION

GENERAL ELECTRIC COMPANY . . . . . VALLEY FORGE SPACE CENTER
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September 12, 1978

Mr. Bernard Singer, Chief
Radioisotopes Licensing Branch
Division of Fuel Cycle & Material Safety
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Ref: File Code 90088

Dear Mr. Singer:

The items below refer to Mr. Paul R. Guinn's letter of May 24, 1978. These responses are based on discussions among Mr. R. G. Oesterling of General Electric Company and Messrs. Guinn and Basson and Ms. Tremper of NRC on July 18, 1978.

Item #1 - Locations of use.

The Space Division occupies several buildings in King of Prussia, PA. Some of these buildings are separated from the main complex by 2 to 3 road miles. Over the life of the license the Division may desire to vacate one or more of these buildings. In such an event, the occupancy of the vacated buildings would be reviewed to determine any needed surveys or decontamination. Given these circumstances, we believed it appropriate to designate the locations as Valley Forge Space Center facilities in King of Prussia, PA.

Since this designation appears to be too broad for licensing purposes, it is proposed that section 1(b) of form NRC-313 read as follows:

> Valley Forge Space Center, 260 Goddard Blvd., King of Prussia, Pa. and ancillary facilities on Allendale Road and on Third Ave., King of Prussia, Pa.

This nomenclature is similar to that of the existing license with the addition of a specific address for the Division's Valley Forge area headquarters.

Item #2 - Designation and training of individual users.

The requirements for experience or instruction of individual users vary somewhat with the proposed use. Personnel with prior similar experience are normally considered qualified by the IRAG. Personnel without the required experience are instructed in subjects which meet the requirements of 10CFR19.12. The instructor normally is the Radiation Safety Officer. However, with IRAG approval, the

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vendors of certain specialized equipment have provided this instruction as part of an overall training package. The competence of the user is verified by various methods. The most common in this facility is use under the supervision of an authorized user. The authorized user then certifies to the IRAG that the new user has the capability to perform the required work safely. Much less frequent are observation during use or oral tests administered by the Radiation Safety Officer. A written test is seldom used. When written test are used, they are normally incorporated into a test of overall operation.

Item #3 - Ionizing Radiation Advisory Group.

The authority of the IRAG to administer the radiation protection program is clearly stated in section #M-6 of the Valley Forge Safety Manual. The Safety Manual in turn is established by Space Division Policy.

Items #4 & #5 - Quantities of byproduct material.

The format of the submittal was identical to the most recent amendment. Nevertheless, section 6 of form NRC-313 is revised as shown below. The quantities listed include a comparatively large quantity of tritium which is awaiting disposal.

6(a) Byproduct Material	6(b) Form and Quantity	
(1) Any byproduct material with atomic numbers 3 to 83, inclusive and except Sr90.	(1) Sealed sources	(1) 40 curies, NTE 1 curie per source
(2) Any byproduct material with atomic numbers 3 to 83, inclusive and except Kr85.	(2) Any form	(2) 5 curies, NTE 0.5 curie per nuclide
(3) Strontium-90	(3) sealed source	(3) 10 curies
(4) Krypton-85	(4) Any form	(4) 45 curies
(5) Hydrogen-3	(5) Sealed sources	(5) 30 curies
(6) Hydrogen-3	(6) Any form	(6) 5 curies
(7) Polonium-210	(7) Sealed sources	(7) 0.5 curies
(8) Polonium-210	(8) Any form	(8) 0.1 curie
(9) Americium-241	(9) Sealed sources	(9) 3 curies

Item #6 - Calibration procedures.

Calibrations are normally performed by, or under the direction of, the Radiation Safety Officer. When an instrument is returned to the manufacturer or sent to a facility

which specializes in radiation protection instrumentation repair, calibration is normally requested as part of the repair service.

The calibration sources used are appropriate to the type of radiation detected and/or measured. Gamma dose rate measurements are compared against instrument response to either a 100 millicurie Cs137 source or a 30 millicurie Co60 source, both corrected for decay Alpha emitter contamination measurements are compared against the response to plutonium plated disc sources. Beta emitter contamination measurements are compared against response to C14, Co60, C136 or Sr90/Y90 sources depending on the energy range, with source strength corrected for decay as needed.

Item #7 - Personnel monitoring.

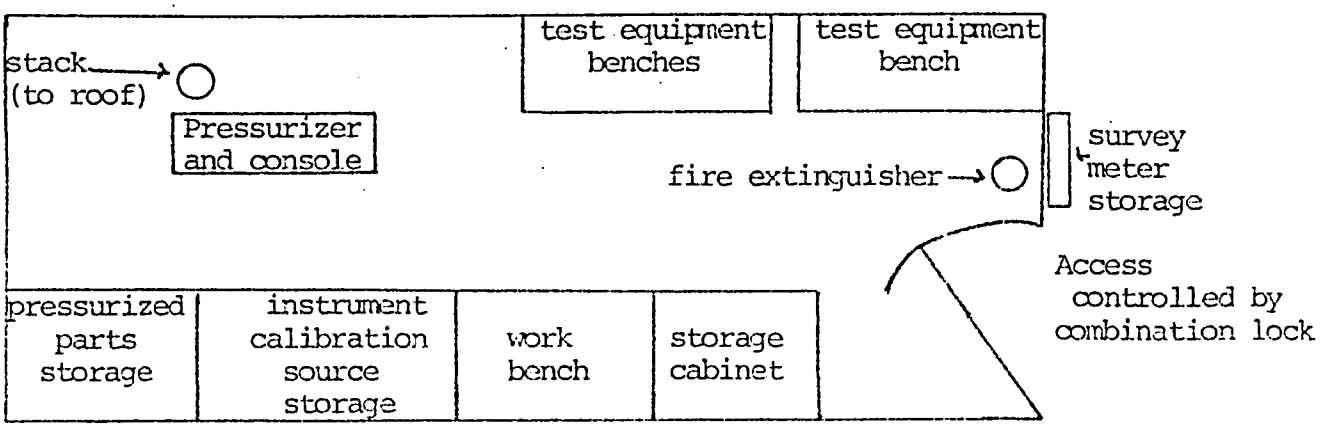
The normal badge exchange frequency is quarterly. More frequent exchanges would be used if warranted. For example, highly variable dose rates to personnel or dose rates above three rems per year would warrant a monthly or more frequent exchange. Currently, there is no need for badge exchanges more frequent than quarterly.

The practice of the IRAG for work with unsealed radioactive materials is to require engineered controls to minimize exposures such that bioassay would not be needed. The need for bioassay is therefore limited to accident or emergency situations. Bioassay would, for example, be required in the event an emergency entry is made to clean up a contamination spill outside a hood or glove box. Another example is the situation where an employee is found to be contaminated on the face or head.

Bioassay is not required for tritium since the entire inventory is in storage, with the major part awaiting disposal. In the event work with unsealed tritium is required, the "Guidelines for Bioassay Requirements for Tritium" will be used as a guide.

Item #8 - Facilities and equipment.

In the meeting of July 18, 1978, it was indicated that a sketch of one example of a facility would be a sufficient response. The sketch below is of a facility for leak-testing electronic components using a Trio-Tech (TM) pressurization device. The sketch is not to scale. This facility utilizes approximately 12 curies of Kr85.



The exhaust system is on uninterruptible power the exhaust stack terminates at 1.3 times the building height as recommended by the ACGIH. The stack monitor and exhaust flow alarm in the Plant Protection Center.

Item #9 - Radiation Protection.

(9a) The limits for contamination are stated in Attachment #7 to the license application. The detection limit for the portable instrumentation in use is approximately 30--50 dis/min. On large surfaces, wipes with an area of approximately 1000 cm^2 are taken. Any equipment which in internally contaminated is tagged as radioactive material.

(9b) Personnel working with unsealed radioactive materials are required to make frequent surveys during the course of a work day using standard, accepted techniques. The Radiation Safety Officer or his delegate makes daily record surveys in areas where unsealed materials, other than noble gases, are in use. Standard good practices such as surveying and/or bagging materials removed from the hood or glove box and surveying the hands, arms and front of the body frequently are used.

(9c) The Radiation Safety Officer or his delegate surveys equipment with a history of contamination prior to disassembly or removal. Where practicable the equipment is decontaminated. Where decontamination is not practicable or removal contamination remains, a restricted area is set up and the work performed under the direction of the Radiation Safety Officer.

(9d) Air sampling or monitoring is performed for any work with quantities of unsealed byproduct material which exceed the values in 10CFR30.71.

(9e) The primary criteria are the linear flow velocity at the front of hood faces and the differential pressure between a room and the interior of a glove box. The specification for hood faces is 150 feet/min as checked with a velometer. Glove boxes are maintained at negative 0.2 to 0.5 inches water gauge with respect to the surrounding room.

(9f) The basic instruction for all employees to report any emergency is to telephone the Plant Protection Center by dialing the emergency number (A-FIRE, 2-3473). Personnel in the Protection Center are given standing orders for contacting various personnel according to the type of emergency.

Personnel who work with radioactive materials are instructed in specific actions to be taken in the event of an emergency involving radioactive materials. Included are such items as fires, spills, monitor alarms and missing sources.

In addition, the plant Fire Brigade receives general instruction regarding fighting fires involving radioactive or other toxic materials.

(9g) A semiannual inventory is made by physically locating sealed sources and verifying quantities of unsealed sources. The attached "Source History" form is used. Entries to this form are at changes only. That is, the semiannual inventories aren't recorded unless a change in location is determined.

Item #10 - Waste disposal.

Attached is a revised Attachment #8 to correct the oversight.

Other Items.

During the meeting of July 18, 1978, Mr. Guinn indicated that Krypton-85 may be released to the environment at an annual average concentration of up to $1x10^{-5}$ uCi/ml with no need for micrometeorological data or determining effluent pathways. An increased release rate for venting of Kr85 from leak test facilities is requested. The Space Center, on Goddard Blvd., is equipped with two exhaust stacks which terminate at a height of approximately 64 feet above grade, which is slightly greater than 1.3 times the height of the building. Grade level is above the surrounding terrain. The nearest residence is further than one-half mile. No site micrometeorological data have been taken. The total flow rate of both exhausts is 860 ft^3/min. The quantity emitted during one year at a concentration of $1x10^{-5}$ uCi/ml would be 128 curies. This value is greater than the anticipated annual requirements.

Please contact me or the Radiation Safety Officer, Mr. R. G. Oesterling, at 215-962-5926 if there are additional questions.

Cordially,

Thomas P. Handley

Thomas P. Handley, Manager
Industrial Security, Safety
and Administrative Services

TPH:mon
attachments
cc: RG Oesterling

ATTACHMENT #8

WASTE DISPOSAL

Solid waste and liquid waste are transferred to Teledyne Isotopes for disposal. In between pick ups, the waste is stored in the waste drum located in the radiation vault. Loose or contaminated materials are bagged before placing in the waste drum. Liquids are in tightly closed plastic or metal containers or sorbed into solid material. Containers of liquids are packed in an outer container with sufficient sorbent material to retain the entire volume of liquid.

SOURCE HISTORY

License #	Space Div. Source #	Date Received
Isotope(s)	Activity	
FORM: ☐ Sealed ☐ Unsealed: ☐ Solid ☐ Liquid ☐ Gas		

LEAKAGE TESTS

Date						
Activity (uCi)						
By						
Date						
Activity (uCi)						
By						

ASSIGNED TO: User	Location	Date	ASSIGNED TO: User	Location	Date

Disposed To	License of Receiver	Date
Reason		