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washington, d.c. 20017
(202) 269-7000

June 21, 1985

John D. Kinneman, Chief
Nuclear Materials Safety Section A
Division of Radiation Safety
and Safeguards
Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

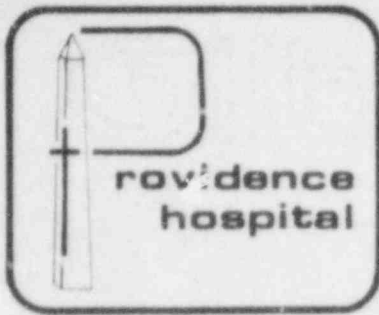
License No. 08-01728-01
Docket No. 030-01316
Inspection No. 85-01

Sir:

Please refer to the enclosed copy of Appendix A, Notice of Violation submitted in your letter of May 24, 1985 after your inspection. The following corrective steps have already been instrumented:

1. The Procedure For Sink Disposal has been updated as of June, 1985 using the data for the year 1984. The calculations obtained show this facility to have been in compliance at all times.
2. A Logbook For Amounts Of Radioisotopes Released To The Sanitary Sewer System is now implemented, sample pages are enclosed. The Logbook shows the isotope used, the amount in microcuries, the date received and the date disposed of along with the technologists initials confirming the data.
3. The Logbook was implemented on June 17, 1985: from this date we believe we are in full compliance.

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I trust these explanations and corrective actions meet the directives of
10 CFR 20.303. Thank you.

Sincerely,

Sister Catherine Norton
Sister Catherine Norton, President
Providence Hospital
1150 Varnum Street, NE
Washington, DC 20017

CN/dlc

Enclosures: (1) Procedure For Sink Disposal, April 1976
(2) Procedure For Sink Disposal, June 1985
(3) Copy of Logbook cover
(4) Copy of initial page of Logbook
(5) Copy of Appendix A, Notice of Violation

PROCEDURE FOR SINK DISPOSAL

Knowing the water used by Providence Hospital and the maximum permissible concentration of a certain isotope in water, one can establish a maximum permissible disposal limit for an isotope in terms of microcuries per day.

DATA:

The following are the rates at which water is consumed at Providence Hospital. These data are based on two six month periods during 1970 and 1971

Average H₂O used in 6 months = 4.45×10^6 ft³/6 month.

This works out to the following consumption rates:

2.52×10^{11} ml/year
 2.10×10^{10} ml/month
 0.678×10^9 ml/day

The maximum permissible concentrations in water are as follows:

For cobalt-60: MPC_w = 1×10^{-3} uCi/ml
 For cobalt-57: MPC_w = 2×10^{-2} uCi/ml
 For I-125: MPC_w = 4×10^{-5} uCi/ml

In any one day, therefore, the following could be disposed down the sink.

For Co-60: Max Activity = $\frac{1 \times 10^{-3} \text{ uCi}}{\text{ml}} \quad 0.678 \times 10^9 \frac{\text{ml}}{\text{day}} =$
 OR $= 0.678 \times 10^6 \text{ uCi/day}$

For Co-57: Max Activity = $\frac{2 \times 10^{-2} \text{ uCi}}{\text{ml}} \quad 0.678 \times 10^9 \frac{\text{ml}}{\text{day}} =$
 $1.36 \times 10^7 \frac{\text{uCi}}{\text{day}}$

OR

For I-125: Max Activity = $\frac{4 \times 10^{-5} \text{ uCi}}{\text{ml}} \quad 0.678 \times 10^9 \frac{\text{ml}}{\text{day}} =$
 $2.7 \times 10^4 \frac{\text{uCi}}{\text{day}}$

The isotope with the lowest MPC)w is I-125. Therefore, if we assume the disposal limit for I-125 as applicable for all isotopes then we can be sure that the MPC)w requirements are not being exceeded.

The AEC also requires that the total activity disposed of during one year does not exceed 1 curie.

If Providence Hospital establishes a maximum disposal limit for any isotope of 2.5 millicuries per day then:

1. The daily MPC)w would not be exceeded.
2. The monthly MPC)w would not be exceeded.
3. The total activity disposed of in one year would not exceed one curie.

PROVIDENCE HOSPITAL
DEPARTMENT OF NUCLEAR MEDICINE
APRIL, 1976

Knowing the water used by Providence Hospital and the maximum permissible concentration of a certain isotope in water, one can establish a maximum permissible disposal limit for an isotope in terms of microcuries per day.

DATA:

The following are the rates at which water is consumed at Providence Hospital. The data is based on total consumption during the year 1984.

Average H₂O used in 12 months = 5.55×10^7 ft³/yr.

This works out to the following consumption rates:

$$1.57 \times 10^{12} \text{ ml/year}$$

$$1.31 \times 10^{11} \text{ ml/month}$$

$$4.3 \times 10^9 \text{ ml/day}$$

The maximum permissible concentrations in water are as follows:

For 60Co: $\text{MPC}_w = 1 \times 10^{-3} \text{ uCi/ml}$

For 57Co: $\text{MPC}_w = 2 \times 10^{-2} \text{ uCi/ml}$

For 125I: $\text{MPC}_w = 4 \times 10^{-5} \text{ uCi/ml}$

In any one day, therefore, the following could be disposed down the sink:

For 60Co Max Activity = $\frac{1 \times 10^{-3} \text{ uCi}}{\text{ml}}$ $4.30 \times 10^9 \frac{\text{ml}}{\text{day}} =$

OR $4.30 \times 10^6 = \text{uCi/day}$

For 57Co Max activity = $\frac{2 \times 10^{-2} \text{ uCi}}{\text{ml}}$ $4.30 \times 10^9 \frac{\text{ml}}{\text{day}} =$

OR $8.60 \times 10^7 \frac{\text{uCi}}{\text{day}}$

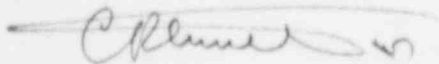
For 125I: Max activity = $\frac{4 \times 10^{-5} \text{ uCi}}{\text{ml}}$ $4.30 \times 10^9 \frac{\text{ml}}{\text{day}} =$

$$1.72 \times 10^5 \frac{\text{uCi}}{\text{day}}$$

The isotope with the lowest MPC)w is 125I. Therefore, if we assume the disposal limit for 125I as applicable for all isotopes then we can be sure that the MPC)w requirements are not being exceeded.

The NRC also requires that the total activity disposed of during one year does not exceed 1 curie; based on 365 days, this will allow disposal of 2.7 millicuries/day. If Providence Hospital establishes a maximum disposal limit for all isotopes of 2.5 millicuries per day then:

1. The daily MPC)w would not be exceeded.
2. The monthly MPC)w would not be exceeded.
3. The total activity disposed of in one year would not exceed one curie.



PROVIDENCE HOSPITAL
DEPARTMENT OF NUCLEAR MEDICINE
June, 1985

ENCLOSURE

LOG BOOK
AMOUNTS OF RADIOISOTOPES
RELEASED TO THE SANITARY SEWER SYSTEM

ISOTOPE	AMOUNT- μ Ci	DATE R'CED.	TECH.	DATE DISP.-SINK	TECH.
^{125}I	4.0	6-17-85	DR		
^{125}I	3.0	6-17-85	DR		
^{125}I	3.0	6-17-85	DR		
^{125}I	4.5	6-17-85	DR		
^{125}I	0.24	6-18-85	OH		
^{125}I	15.0	6-19-85	QC		

APPENDIX ANOTICE OF VIOLATION

Providence Hospital
Washington, DC 20017

Docket No. 030-01316
License No. 08-01728-01

As a result of the inspection conducted on March 29, 1985, and in accordance with the NRC Enforcement Policy (10 CFR 2, Appendix C), the following violation was identified:

10 CFR 20.201(b) requires that each licensee make such surveys as may be necessary to comply with all sections of Part 20. As defined in 10 CFR 20.201(a), "survey" means an evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radiation under a specific set of conditions.

Contrary to the above, as of March 28, 1985, evaluations were not made to assure compliance with 10 CFR 20.303, which limits the disposal of licensed material by release to a sanitary sewerage system. Specifically, an evaluation was not made of the releases to the sanitary sewer system in the Pathology Radioimmunoassay Laboratory where iodine-125 is used.

This is a Severity Level IV violation. (Supplement IV)

Pursuant to the provisions of 10 CFR 2.201, Providence Hospital is hereby required to submit to this office within thirty days of the date of the letter which transmitted this Notice, a written statement or explanation in reply, including: (1) the corrective steps which have been taken and the results achieved; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved. Where good cause is shown, consideration will be given to extending this response time.

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