



UNITED  
HOSPITAL

CENTER Post Office Box 1680 Clarksburg, West Virginia 26302-1680 Telephone 304/624-2574

April 22, 2010

Licensing Assistant Section  
Nuclear Materials Safety Branch  
U.S. Nuclear Regulatory Commission, Region I

P-7

Fax (610) 337 - 5269

030 03375

Re: NRC License #47-01458-01; request for additional information  
Mail Control # 144489

I have attached an addendum to Item 9 which addresses the question you posed in your email of April 22, 2010.

If you have any questions or require additional information, you can call me at (304) 624-2574 or email me at [IsraelJ@uhcwv.org](mailto:IsraelJ@uhcwv.org).

Thank you.

Sincerely,

James W. Israel  
Radiation Safety Officer

This FAX has 2 pages, including this cover sheet.

144489

NMSS/RGN1 MATERIALS-002

## Item 9 Addendum – April 2010 Facilities and Equipment

### 9.e. Other facilities and equipment

#### Exposure rate control in rooms above and below where I-131 sodium iodide therapy and manual brachytherapy are performed

The distance between patient floors is at least 4.25 m, and the floors are 5.25" (13.3 cm) thick concrete.

For iodine therapies, we see a typical exposure rate of about 22 mrem/hour at one meter. Data from NUREG/CR-5740 indicate that 5.25" of concrete will provide an attenuation of about 0.25 for iodine-131, so the expected exposure rate in rooms above and below the patient therapy room is

$$\text{Exposure rate} = 22 \text{ mrem/hour} \times (1/4.25)^2 \times 0.25 = 0.304 \text{ mrem/hour}$$

which is well within the limits for the general public.

For manual brachytherapies using cesium-137, we see a typical exposure rate of about 40 mrem/hour at one meter. According to NCRP Report Number 49, the tenth-value-layer (TVL) for cesium-137 in concrete is 15.7 cm, so the 13.3 cm concrete in our floors will provide an attenuation of about 0.14, and the expected exposure rate in rooms above and below the patient therapy room is

$$\text{Exposure rate} = 40 \text{ mrem/hour} \times (1/4.25)^2 \times 0.14 = 0.310 \text{ mrem/hour}$$

which is well within the limits for the general public.

We recognize that the above calculations are gross estimates, although we consider them to be conservative. Therefore, when a therapy is administered we will measure the exposure rates in the rooms above and below the room used for the therapy. If the measured rates are above the limits for a member of the general public, we will arrange for that room to be unoccupied until the therapy has been completed, or – in the case of iodine therapy – until the material has decayed to the point where the radiation in the adjacent room above or below has fallen to within the limits for the general public.