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ASSOCIATION

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July 20, 1987

John E. Glenn, PhD, Chief  
Nuclear Materials Safety Section B  
Division of Radiation Safety & Safety  
U.S.N.R.C.  
Region I  
631 Park Avenue  
King of Prussia, PA 19406

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Re: License No. 06 09522 02  
Docket No. 030 00118  
Control No. 106571

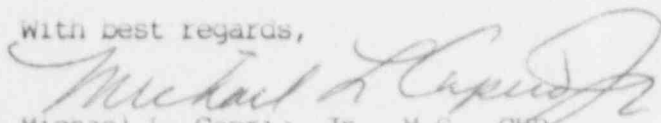
Dear Dr. Glenn:

We are in receipt of your letter dated 26 June 1987 in which additional information was requested concerning certain testing performed during the Cobalt 60 source exchange. The information that you require is as follows:

(1) Detailed information (raw data and calculations) for the testing of transit error and timer accuracy are attached and labelled as Appendix A.

If any additional information is required, please do not hesitate to contact the hospital.

With best regards,

  
Michael L. Caprio, Jr., M.S., CHP  
Certified Health Physicist

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# APPENDIX A

(1) TESTING OF TRANSIT ERROR: Transit error is defined as the time variation between the activation of the unit's timing device and the full open position of the Cobalt 60 source. It is tested by methods excepted by the North East Center for Radiological Physics (NE CRP) in which the source output as measured at two (2) different treatment times is compared. Raw data and example follow:

R = unit measured output ; t = unit treatment time ; = transit error

$$R(a) = 381.40 \text{ R}$$

$$R(b) = 127.69 \text{ R}$$

$$t_a = 3 \text{ min.}$$

$$t_b = 1 \text{ min.}$$

$$\begin{aligned} \eta &= \frac{R_b t_a - R_a t_b}{R_a - R_b} = \frac{(3)(127.69) - (381.4)(1)}{381.4 - 127.69} \\ &= \frac{1.67}{253.71} = + 0.0066 \text{ minutes} \end{aligned}$$

(2) TESTING OF TIMER ACCURACY: Timer accuracy is tested by means of AAPM accepted procedure in which the dose rate is calculated for a series of different treatment times. The individual dose rates are summed; averaged and a +/- 2% range is calculated. The treatment timer is considered accurate if individual dose rates fall within the +/- 2% limit. Raw data and example follow:

<u>Time</u>	<u>Dose</u>	<u>Dose rate</u>	
5 m	580	116.0	
1 m	115	115.0	
1/2 m	58.1	116.2	Average = 115.7
			+/- 2% range = 113.4 to 118.0

Results. treatment timer accurate