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Waterville Osteopathic Hospital

SINCE 1943 - OVER 30 YEARS OF MEDICAL SERVICE TO CENTRAL MAINE

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RICHARD E. CLARK
EXEC. VICE-PRESIDENT

8 February 1979

REG.

SECTION

Mr. Joseph DelMedico
License Management Branch
Division of Fuel Cycle and Material Safety
Washington, D.C. 20555

Dear Mr. DelMedico:

In regard to your letter of January 26, 1979 which accompanied the renewal of our byproduct material license No. 18-15503-01, we submit the following additional information to our application and request that special condition No. 16 be removed from our license.

The dose calibrator shall be tested for linearity at quarterly intervals in accordance with procedures set forth in Appendix D, Section II. You can be assured that this test will be done on a quarterly basis and the written procedure will be enclosed in our procedure book.

Enclosed: Test of instrument linearity.

Sincerely yours,

Richard E. Clark
Executive Vice-President

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E. Test of Instrument Linearity

The linearity of a dose calibrator should be ascertained over the entire range of activities employed. This test will utilize a vial of Tc-99m whose activity is equivalent to the maximum anticipated activity to be assayed (e.g., the first elution from a new generator).

1. Assay the Tc-99m vial in the dose calibrator and subtract background level to obtain net activity in millicuries.
2. Repeat step 1 at time intervals of 6, 24, 30, and 48 hours after the initial assay.
3. Using the 30 hour activity measurement as a starting point calculate the predicted activities at 0, 6, 24, and 48 hours using the following table:

<u>Assay Time (hrs)</u>	<u>Correction Factor</u>
0	32
6	16
24	2
30	1
48	0.125

Example: if the net activity measured at 30 hrs. was 15.625 millicuries, then the predicted activity for 6 and 48 hours would be $15.625 \text{ mCi} \times 16 = 250 \text{ mCi}$ and $15.625 \text{ mCi} \times 0.125 = 1.95 \text{ mCi}$ respectively.

4. Plot the measured net activity for each time interval versus the predicted activity on log-log graph paper.
5. The activities plotted should be within $\pm 5\%$ of the predicted curve if the instrument is linear and functioning properly. Errors greater than $\pm 5\%$ indicate the need for repair or adjustment of the instrument.
6. If instrument linearity cannot be corrected, it will be necessary in routine assays to either assay an aliquot of the eluate that can be accurately measured, or to use the graph constructed in step 4 to relate measured activities to true activities.

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