Christopher M. Butt, Ph.D.
Radiation Safety Officer
WV Sch. of Osteopathic Medicine
400 North Lee St.
Lewisburg, WV 24901
June 6, 2007

Lizette Roldan
U.S. Nuclear Regulatory Commission, Region I
475 Allendale Rd.
King of Prussia, PA 19406-1415

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Dear Lizette:

Thank you for your guidance in the amendment process for our NRC license No. 47-19315-02.

The first purpose of this amendment is to remove the current RSO and authorized user, Christopher M. Butt, and replace Dr. Butt with John A. Schriefer. Dr. Schriefer was the RSO and an authorized user on our previous license No. 47-19315-01, which was decommissioned in 2004.

The second purpose of this amendment is to approve the calibration of our 96-well liquid scintillation counter by our RSO in accordance with the manufacturer's instructions. Our license currently allows calibration by manufacturer technicians only. We respectfully request that this small amendment be approved for several reasons. First, the RSO is qualified to perform the calibration procedures. Second, the procedures are simple and typically performed in-house at most institutions. Finally, the flexibility of having the RSO perform these duties would save WVSOM significant sums of money in maintenance costs that primarily go towards travel time for manufacturer technicians.

The calibration procedures, the frequency of calibration, and the sealed source used for calibration are included in this amendment and are in accordance with Appendix M of NUREG-1556, Volume 7.

Any questions should be directed towards Dr. Christopher M. Butt, current RSO. He can be reached at 800.356.7836 x. 242, and his email is cbutt@wvsom.edu. Thank you for your time and consideration.

Best regards,

Christopher M. Butt

Dr. Christopher M. Butt, RSO

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NMSS/RGN1 MATERIALS-002

Amended Application; West Virginia School of Osteopathic Medicine

Previously approved (Page 6 of 15 in original application)

10. Radiation Safety Program

- *Radiation Monitoring Instruments*

Our radiation monitoring instruments are:

1. Bicron GM Surveyor (Model 2000) with PGM pancake probe and check source. The meter will be calibrated by Physics Associates of Roanoke, VA (NRC License #45-17344-01);
2. Wallac Microbeta 1450-021 96-well liquid scintillation counter, maintained and calibrated by Perkin-Elmer; and
3. an LKB Minigamma 1275 counter, maintained and calibrated by Perkin-Elmer.

These instruments meet the radiation monitoring instrument specifications published in Appendix M to NUREG 1556, volume 7. We reserve the right to upgrade these instruments as necessary to meet regulatory requirements.

Proposed Amendment

10. Radiation Safety Program

- *Radiation Monitoring Instruments*

Our radiation monitoring instruments are:

1. Wallac Microbeta 1450-021 96-well liquid scintillation counter, maintained and calibrated by the RSO or by Perkin-Elmer in accordance with the manufacturer's instructions;
2. Bicron GM Surveyor (Model 2000) with PGM pancake probe and check source. The meter will be calibrated by Physics Associates of Roanoke, VA (NRC License #45-17344-01);and
3. an LKB Minigamma 1275 counter, maintained and calibrated by Perkin-Elmer.

These instruments meet the radiation monitoring instrument specifications published in Appendix M to NUREG 1556, volume 7. We reserve the right to upgrade these instruments as necessary to meet regulatory requirements.

- *Calibration Procedures for Wallac Microbeta 1450-021*

Calibration of the Wallac Microbeta 1450-021 is performed on an annual basis. Calibration records and calibration tags for this instrument will be maintained in accordance with Appendix M to NUREG 1556, volume 7.

The Microbeta 1450-021 has 6 detectors allowing it to count 6 samples simultaneously. In order for the results from each detector to be equivalent, irrespective of variations in efficiency and background between detectors, it is necessary to determine the relative efficiency and background of each detector and then correct for it.

Calibration is done by measuring a background sample followed by one or more standard samples with defined activity in each detector. Once CPMs have been measured the relative efficiencies can be calculated. The efficiency of the detector giving the highest count rate is then defined to be 1 and the other detector efficiencies are expressed as a fraction of this value. These fractions are called efficiency coefficients. Actual isotope activity is provided so that absolute efficiencies are calculated by dividing the count rates by the activity. In this way, sample quench and detector absolute efficiencies are corrected for. Thus, when measuring a sample with a particular detector, the CPM of the sample is corrected by dividing the CPM by the efficiency coefficient. After calibration is performed the results are stored on the controlling computer.

A calibration plate containing standardized sources of ^{3}H and ^{14}C will be used in this process. This 96-well plate is supplied by Perkin-Elmer as catalog number 1450-471. The plate typically contains approximately 250,000 dpm of ^{3}H and 150,000 dpm of ^{14}C. These dpm values can vary from lot to lot, but they are always calibrated to NIST standard reference materials that are published in the certificate that is shipped with the plate.

If a particular counting method uses different isotopes or has a different amount of quench than the Perkin-Elmer plate, custom calibration plates can be made from typical counting plates. In any case, the calibration plate supplied by Perkin-Elmer, and described in the previous paragraph, will always be available to ensure proper functioning of the counter. The procedures for making custom calibration plates are clearly outlined in the Microbeta's user manual, and the salient points are copied from that manual below:

Calibration samples must be in plate positions that can be measured by every detector. The positions cannot be changed by modifying protocol parameters. Actual activity values are inserted into the calibration protocol. Be careful that the samples are in the correct positions when making your own normalization plates. For a 24-well plate the samples should be in the following positions: Background (C5); Isotope 1 standard (D5); Isotope 2 standard (D6); or Single label standard (D6). For a 96-well plate the samples should be in the following positions: Background (A1); Isotope 1 standard (G11); Isotope 2 standard (H12); or Single label standard (G11).

The calibration procedure itself is very straightforward. The calibration plate is placed in a cassette which is identified with a protocol flag and a NORM/STD label in the function code area. The cassette is inserted into the counting rack, and the counter door is then closed. The Start button is clicked in the user interface, and the plate is then analyzed. After counting, the actual results, background and detector efficiency values are output and stored on the controlling computer. These data are then used for accurate counting of unknown samples.