The Dickenson Wise Medical Group

WISE CLINIC
P. O. BOX 17
WISE, VIRGINIA 24293

ADMINISTRATOR
Tommie R. Massey

MEDICAL DIRECTORS
Kurtz E. Alderman, M.D.
Darlene Litton, M.D.
A. W. North, M.D.

FAMILY PRACTICE
L. J. Fleenor, M.D.
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Fred M. Litton, M.D.
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GASTROENTEROLOGY
Anant B. Soni, M.D.

GENERAL PRACTICE
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INTERNAL MEDICINE
S. S. Tholpady, M.D.

OBSTETRICS & GYNECOLOGY
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ORTHOPAEDIC SURGERY
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ORTHOPAEDIC & HAND SURGERY
S. K. R. Udupa, M.D.

OTOLARYNGOLOGY
Braxton F. Cunn, Jr., M.D.

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RADIOLOGY
M. R. Ramakrishnan, M.D.

SURGERY
L. D'Amato, M.D.
S. T. Merka, MD
Wolfgang Zahnke, M.D.

UROLOGY
B. Sheshadri, M.D.

August 21, 1990

Mr. William E. Cline
Chief, Nuclear Materials Safety
and Safeguards Branch
U.S. Nuclear Regulatory Commission
Region 11
101 Marietta Street, N.W.
Atlanta, GA 30323

Re: Docket No. 030-17054
License No. 45-19154-01
NCR Inspection Report No. 45-19154-01/90-01

Dear Mr. Cline:

This is the second response to a notice of violation dated June 11, 1990. The two violations that required the assistance of a Physicist have been corrected; Mr. Lee Anthony, Roanoke, Virginia made a consultation visit on July 31, 1990. The corrective action taken to correct violations A and D are provided below:

A. A dedicated check source is available for use by the technician. The apparent exposure rate from a dedicated check source was obtained and is posted on the survey instrument. And the reading used to check the operation of the survey instrument each day of use.

D. Surveys for the contamination "wipe test" are accomplished utilizing the "well counter". Dr. Anthony instructed the staff and calibrated the dose calibrator during his July 31, 1990 visit. Records are being maintained to record contamination and ambient radiation exposure rate, the instrument utilized and the initials of the person making the survey.

The Dickenson Wise Medical Group's previous response, dated July 30, 1990, requested an extension until August 31, 1990 to complete all actions necessary to insure compliance. A written approval of this request was not received, therefore, it was assumed your office agreed with an extension until August 31, 1990.

Big Stone Gap Clinic
Holton Avenue
Big Stone Gap, VA 24219
703/523-2000

Dickenson Clinic
Fox Town Road
Clintwood, VA 24228
703/926-4601

Wise Clinic
Spring Street & Hwy. 23
Wise, VA 24293
703/328-2631

A copy of Mr. Anthony's consultation visit is attached for your information. Mr. Anthony will be making regularly scheduled, quarterly visits to the Wise Clinic.

If I may be of any further assistance, please let me know.

Sincerely,

Tommie R. Massey
Administrator

/lak

Enclosure

cc: Dr. Ramakrishnan
Ms. Patty Wells

MEDICAL PHYSICS
SHIELDING RECOMMENDATIONS

RADIATION PHYSICS
EMERGENCY CONSULTATION

PHYSICS ASSOCIATES

5346 Peters Creek Road
Roanoke, Virginia 24019
Tel: (703) 563-0165

Lee S. Anthony, Ph. D.
Certified Health Physicist
Certified Radiologic Physicist

Lee S. Anthony, Jr., B.S., M.A.
Debra A. Costanzo, M.S.
Robert C. Hudson, M.S.
Kay A. Saul, B.S.

August 17, 1990

Dickenson Wise Medical Group
Wise Clinic
P.O. Box 17
Wise, Virginia 24293

To Whom it May Concern:

This letter will summarize my consultation with the Wise Clinic on July 31, 1990.

I was on-site for approximately six hours; primarily, giving in-service training, making measurements, and reviewing records.

To assist the Technologists, I dictated my comments while discussing the N.R.C. Regulations, wipe tests, the evaluation of wipe tests, the efficiency of the Nuclear Medicine gamma camera, the operation of the survey meter, and other pertinent subjects.

I performed a calibration of the GM survey meter, placed an operational check source on the side of the meter, and left a calibration certificate as well as placing a calibration sticker on the side of the instrument.

I understand that a technologist from a nearby hospital will be asked to provide on-the-job training for your new technologist. Short of procuring either a certified Nuclear Medicine Technologist or an O.J.T. Technologist, this will be the best temporary arrangement.

We have established the next regular quarterly visit as the afternoon of November 16, 1990.

Please do not hesitate to call me at any time prior to the meeting.

Sincerely,

Lee S. Anthony

Lee S. Anthony, Ph.D.
Certified Health Physicist
Certified Radiologic Physicist

Attachments

MEDICAL PHYSICS
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Dickenson Wise Medical Group

Wise Clinic

Date: July 31, 1990

Consultant: Dr. Lee S. Anthony - Physicist Consultant

Dr. Lee Anthony was here at the Wise Clinic to comment on several actions which were promised Mr. Massey to Mr. William Cline of the NRC, in his letter of July 30, 1990.

"Tape of In-Service to Nuclear Medicine Technologists"

"We begin by reviewing the sources of documentation with the technologist involved and these are primarily the NRC rules and regulations which is Title 10 CFR.35; also review parts 19 and 20. Nineteen includes employee relations and so forth and Twenty primarily radiation protection.

The first item which we discussed was the performance of wipe tests and the necessary documentation relating to that. We understand that the wipe tests have been evaluated here at the Clinic by use of the nuclear medicine gamma camera, therefore, we need to determine an efficiency factor for the gamma camera. We explained that the procedure, once the efficiency is determined, was then to get an appropriate background count. The results being in counts per minute. Then take a count of the wipe, which would be Gross counts per minute; then subtract the background CPM from the gross CPM and this would give us a net count per minute for the wipe. We divide the net counts per minute on the wipe by the efficiency of the counter to obtain disintegrations per minute or DPM. Once we have obtained the DPM of the Wipe (net DPM of the wipe) we divide the net DPM of the Wipe by the area of countertop or whatever was wiped in units of 100 cm square. We take the length x width to get the area of Wipe. We divide this numerically by 100 to get it into units of one hundred cm square and carry out the division.

The NRC criteria for the Wipe test in terms of action levels are designed in NRC Reg. Guide 10.8 Revision 2, August 1987. Generally, the most restrictive of these action levels would be for materials such as I-131 and would be 200 DPM per one hundred cm square. Therefore, if a wipe is hotter than that, the area must be decontaminated until a subsequent wipe is at or below that level. Contrasted with this action level is a concept referred to as the trigger level. The trigger level is discussed in the NRC rules and regulations title 10 CRF part 35.70 and the essence of that is that the trigger level is a level set within the department at which the technologist must immediately notify the radiation safety officer of the contamination of the wipe, if it is a wipe test; or the survey reading if it's an area being surveyed by a GM survey meter. For GM area surveys: to determine the trigger level, it should be a reading in mR per hour which is sufficiently great so that the technologist feels that he or she must immediately notify the radiation safety officer. If it is a surface which is normal and is considered to be a cold or uncontaminated surface then anywhere from twice the normal background to five or ten times the normal background would be considered as this trigger level or panic level. In other areas, for example in close proximity to the Technetium generator, the levels will be higher, and you probably should have a different trigger level for that area. We know for example that we may not in a restricted area have more than 2.5 mR per hour in a space in which the technologist works a forty hour work week. You may therefore wish to select a number which is two or three times that as your trigger level. In other words, 5 or 10 mR per hour could be a reasonable trigger level in that vicinity. We have selected trigger levels for the GM area surveys and for the Wipe tests. These trigger levels have been written on the current survey sheets and must be written on subsequent sheets. The trigger level for the GM area survey has been selected as 5mR per hour. Whenever the reading in the department gets that or above 5 mR per hour, the radiation safety office, Dr. Rama must be immediately notified by the technologist of this fact. We also note that the trigger levels selected for the wipe test is 20,000 DPM per 100 CM square, realizing that the action level is generally going to be at or above 200 DPM per 100 CM square. Whenever a wipe registers 20,000 DPM in a 100 CM square, then the technologist must immediately notify the RSO, Dr. Rama.

We have now determined the efficiency of the nuclear medicine camera for a sample Technetium 99 and we have used the value of efficiency so obtained to evaluate a wipe test which is made in the hot lab. The value which we have obtained for the efficiency of the nuclear medicine camera is probably unreasonably low. Its efficiency will probably be found to be better; that is higher, if a smaller source of Technetium is used. Ideally, one would use probably about 10 microcuries of Technetium for this study. However, in the interest of saving time and so forth, we used a vial which was available, which had 1.3 milliCuries in the vial. Nevertheless, the procedure which we have followed can be reviewed by the technologist and can be used with a 10 microcuries source for determining the efficiency of the camera. We determined the efficiency of the camera by first of all counting the background, which was 406 counts per minute. We also noted that the corresponding count on a control wipe, that is, an alcohol prep which had not been used on any other surface, was 392 counts per minute. Statistically, these are the same two numbers. We then wiped an area 8 cm x 2.5 cm on the top of a plastic box which contained used vials, etc. The area wiped is therefore 20 cm^2. We subtracted the control counts per minute, 392, from the gross wipe counts of 396, to get a net counts per minute of 4 CPM. Statistically, this number is essentially zero, but to illustrate the principle, we continued the process. We divided the 4CPM by the efficiency of the camera. At this point we digressed to determine the efficiency of the counter. We counted the 1.3 millicuries source with the camera and obtained 586,141 CPM. The 1.3 millicuries source corresponds to 2.89 times (ten to the ninth) disintegrations per minute. Dividing the 586,141 CPM by 2.89 times (ten to the ninth) disintegrations per minute and multiplying by 100 to put this into percentage. We get as a result 0.02% or as a decimal fraction 0.0002 for the efficiency of the camera. We now return to the computation. Dividing 4 CPM by an efficiency 0.0002, we obtain 20,000 disintegrations per minute. 20,000 disintegrations per minute divided by 0.20 times 100 CM squared (which is the area wiped) equals 100,000 disintegrations per minute per 100 CM square. This result is far too high to constitute a valid wipe test result. Again, I say the efficiency should be redetermined, using a smaller source and I would suggest that a large area also be wiped and the results of the new measurements can be compared with this and will certainly be more favorable. This concludes paragraph D of Mr. Massey's

letter, which indicates we will calibrate, (actually it should have said, I believe, "calibrate the camera", rather than, "the Dose Calibrator"). I understand that the Dose Calibrator is being properly calibrated daily by the technologist using the Dose Calibrator reference sources, and their results are always within plus or minus 5% of the expected activity of these Dose Calibrator reference sources. We have discussed that with the technologist.

We will next go to the subject of the survey meter. The survey meter which is an Eberline 520, serial # 1628, which will read in five ranges, from zero to 2,000 mR per hour. According to current NRC regulations, this survey meter should be calibrated at least annually. Here we will reference, Reg. Guide 10.8 and the NRC regulations for that point. The department has obtained a dedicated check source. Ideally this check source should be mounted on the side of the meter case with epoxy or some other source of attachment. This check source is a Cesium-137 check source of a nominal 5 microcurie activity.

We will now discuss the operational check which is to be performed on the survey meter every day in which the laboratory is in use. This operational check need not be logged, but it must be performed every day the laboratory is in use. We first turn the battery on, we turn the range selector to "battery", and we note in this case, that the needle moves up to the black arc which is labelled "BATT - OK". As long as the needle is within this black arc, it tells us that the batteries are sufficiently good for the operation of the meter. Beware of the needle suddenly moving downward after being turned to battery check. This would be analogous to a flashlight with "dead" batteries or deficient batteries coming on momentarily bright and then fading away. So the range selector should be left in the battery position for 10 seconds or so to make sure that it is going to stay up.

Next, return the selector to an appropriate range to be defined in a moment. We opened the window of the GM detector and placed the open window over the operational check source, which is on the side of the meter. Doing so on this instrument gives us a deflection of approximately 10 MR per hour times a range factor of 10, equals 100 MR per hour. My first comment is that this is hotter than most operational check sources. Most operational check sources give approximately

1MR per hour, but this one seems to be hotter. Having determined then the normal response of the instrument to that particular check source which is mounted on this side, we will mark for your convenience with a marking pen, both the meter face and the range selector position to indicate visually and quickly where the operational check should come to each day of use.

We continue with the notes of 7/31/90. We have remeasured the efficiency of the nuclear medicine gamma camera, and have found the efficiency to be 0.027 or 2.7%. Using this newer and more accurate value for the efficiency, we have recalculated the example of the wipe test analysis. We have also performed a measurement of the air flow rate in the room and have developed a statement regarding clearance time in the event of significant spills of airborne materials. We have calibrated the survey meter and have left a calibration certificate on site and have put a calibration sticker on the side of the meter. The next calibration will be due no later than 7/91. We have also performed today an annual instrument accuracy test for the Dose Calibrator and a Sealed Source Inventory and Leak Test. Both tests have been satisfactory, and have been documented in the rough. We have discussed with the assembled staff, the requirements for being aware of the requirements of 10 CFR Parts 35, 19, 20, as well as Reg. Guide 10.8 Revision 2, August 1987. We have discussed with Dr. Rama the medical/legal implications of the quality of the product and his responsibility for same as both the Radiation Safety Officer and as the authorized user of the license. It has been agreed that for the next year, we will have quarterly Nuclear Medicine visits by myself, at which time I will review the quality control documentation and generally consult with the staff.

Lee S. Anthony

Lee S. Anthony, Ph.D.
Certified Health Physicist
Certified Radiologic Physicist

LSA/kas