DEPARTMENT OF VETERANS AFFAIRS
Veterans Health Administration
National Health Physics Program
2200 Fort Roots Drive
North Little Rock, AR 72114

MAY 31 2011

In Reply Refer To: 598/115HP/NLR

Kevin G. Null
Division of Nuclear Material Safety
Region III, Nuclear Regulatory Commission (NRC)
2443 Warrenville Road, Suite 210
Lisle, Illinois 60532-4352

Re: Reply to NRC Inspection Report 030-34325/11-30(DNMS)

Dear Mr. Null:

I am responding to referenced inspection report dated May 6, 2011, for an inspection at VA Nebraska Western Iowa Health Care System, Omaha, Nebraska. This facility has a permit that is under NRC License 03-23853-01VA. The report noted three concerns for uses of radioactive materials.

In response, I am enclosing a memorandum from the facility dated May 26, 2011, to address the concerns. I reviewed the response and endorse the corrective actions. As additional information, the Radiation Safety Officer indicated to my staff that corrective actions would be completed no later than June 30, 2011 (i.e., procedure revisions effective and training completed).

I will evaluate implementation of facility actions during our next routine core inspection.

Please contact me if you have any questions or comments about this matter.

Sincerely,

Gary E. Williams
Director, National Health Physics Program

Enclosure

Department of Veterans Affairs

Memorandum

05-31-11A10:36 RCVD

Date: May 26, 2011

From: Acting Director, Nebraska-Western Iowa Health Care System (636/00)

Subj: Nuclear Regulatory Commission (NRC) Inspection Report

To: Director, VHA National Health Physics Program (NHPP) (115HP/NLR)

1. During the NRC's recent routine inspection of the radiation safety program at the VA Nebraska/Western Iowa Health Care System (VANWIHCS), three items of concern were identified and documented in its inspection report (NRC Inspection Report 030-24325/11-30(DNMCS)). In response to these concerns, the VANWIHCS offers the following corrective actions to assure the NRC that the issues will be addressed and corrected by the VANWIHCS.

1) Concern 1: Individuals Not Wearing Personnel Dosimetry in Nuclear Cardiac Stress Tests

Description of Concern

The inspector observed a nuclear medicine stress test study that was being performed in the Cardiology Department and noted that a technician and a physician in the treatment room who were participating in the procedure were not wearing personal dosimetry. After the study was completed the inspector asked the radiation safety officer (RSO) if the individuals were trained radiation workers. The RSO confirmed that the individuals were trained radiation workers, and that they were required by a procedure tied down in the permit to wear their assigned personal dosimeters while working with patients being treated with radioactive materials. Subsequent to the inspection, a representative of the NHPP and NRC staff members performed independent calculations of the expected radiation dose to each individual and noted that they were well below Title 10 of the Code of Federal Regulations (CFR) 20.1502 (a)(1) requirements for monitoring the occupational dose to individuals. Nevertheless, the NRC is concerned that the permittee was not complying with a procedure that was tied down in the permit which required these individuals to wear dosimetry.

Corrective Action

The VANWIHCS requires that all workers routinely involved in nuclear cardiac stress tests be properly monitored for radiation exposure. In addition to nuclear medicine technologists (NMTs), this category of workers include cardiology technicians (Houlter technicians), nurse practioneers, and cardiologists. To ensure compliance the following steps have been taken;

a) For each nuclear cardiac stress test, cardiology workers involved in the procedure will be required to sign a form *(Cardiology Personal Dosimetry Verification Tracking Form)* indicating that they are wearing dosimetry. A copy of this form is included in Attachment 1 for your review. In the event that an

individual does not have their dosimetry, and does not have time to obtain dosimetry without unduly impacting patient care, the procedure may be completed but the RSO must be immediately notified thereafter. The RSO will then evaluate the failure of the worker to have dosimetry and document corrective actions.

b) The RSO will perform (and document) inspections in the nuclear cardiac stress area at least monthly. The inspection will include reviewing the *Cardiology Personal Dosimetry Verification Tracking Form* and verifying that dosimetry is being worn by personnel. The RSO and Radiation Safety Committee may take action to restrict an individual's access to radioactive material use areas if required dosimetry is not worn. After a six month period the RSC will evaluate if the sign-in sheet should be continued.

c) All individuals routinely involved with nuclear cardiac stress testing will be required to take initial radiation safety training associated with nuclear cardiac stress testing. The training will include the requirement for dosimetry, documentation on the *Cardiology Personal Dosimetry Verification Tracking Form,* and actions that may result from the failure to wear dosimetry. The training must be completed initially for new workers and repeated at least annually (or whenever the procedure is changed). The training material and documentation of training will be maintained onsite for future inspection. A copy of the training material has been included in Attachment 1 for your review.

2) Concern 2: Inconsistencies in Radioactive Material Inventory Control in Research Areas

Description of Concern
The inspector toured several research laboratories, observed work practices in the laboratories, and interviewed available laboratory staff. Based on the inspector's observations, the NRC has an overall concern about the apparent lack of control of radioactive material being used and stored in laboratories and noted inconsistencies in radioactive material inventory control practices between laboratories and researchers. For example, some researchers updated their inventory after each use of permitted material, while others updated their inventories on a less frequent basis. In addition, some researchers were unaware that radioactive material had been added to their storage area from laboratories that were no longer active. The inspector discussed the concerns with the RSO who initiated an investigation in order to verify that all permitted material could be accounted for and that nothing was misplaced or lost. On March 24, 2011, the RSO confirmed that he had accounted for all permitted radioactive material that had been assigned to the research laboratories.

Corrective Actions
The VANWIHCS has taken the following steps to improve its tracking and control of radioactive material in research areas:

a) The radiation safety manual has been revised in Section B-1 as follows:

As Radioactive Material is used, an internal record (e.g., logbook, Radioactive Material Receipt and Disposal Record, etc.) must be updated indicating the amount of Radioactive Material used. This needs to be updated on the day of use of the Radioactive Material so Inspectors and Auditors can review the current inventory.

The Radiation Safety Office will send an "Inventory Verification Report" to each Authorized User on a monthly basis. The Authorized User (or representative) will make a check mark confirming that each vial of Radioactive Material on the inventory is currently in their possession. The Authorized User will sign the form and return it to the Radiation Safety Office within a week from when it is received. If the "Inventory Verification Report" is found to be incorrect, contact the Radiation Safety Office immediately!

The Radiation Safety Office will perform an audit at least quarterly to visually confirm the Inventory Verification Reports. During this audit, internal records of Radioactive Material used will also be audited. It is imperative that a representative from the laboratory assist the Radiation Safety Office in performing this audit.

b) All individuals authorized to use radioactive material in research areas will be trained on these inventory control requirements as well as the importance of properly securing radioactive material from unauthorized access. The training must be completed initially for new workers authorized to use radioactive material in research and repeated at least annually (or whenever the procedure is changed). The training material and documentation of training will be maintained onsite for future inspection. A copy of the training material is included in Attachment 2 for your review.

3) Concern 3: Survey for Contamination of Radioactive Material in Research Areas

Description of Concern
Based on the inspector's observations, the NRC is also concerned about the permittee's apparent failure to implement procedures which require that periodic area wipe tests for removable contamination be conducted in research laboratories. During an interview with a researcher, the inspector determined that the researcher was unaware of the requirement to perform wipe tests for removable contamination in his laboratory. The RSO performed wipe tests for removable contamination and on March 21,2011, confirmed that the results were negative for removable contamination.

Corrective Actions
The VANWIHCS has taken the following steps to ensure proper surveys of radioactive material are being performed in research areas:

a) In accordance with the radiation safety manual (RSM), research users are required to perform an operational scan for contamination at the end of each working day of radioactive material use. The operational scan is performed using a radiation detector appropriate for the radiation emitted by the radioactive material used. The RSM has been revised to require that this instrument survey be documented. An *Instrument Survey Log* form has been created for each Authorized User in research to document these instrument surveys.

b) The RSM has been revised to now require Authorized Users in research to perform a contamination wipe at least weekly if radioactive material is used. A *Wipe Survey Form* has been created for each Authorized User in research to document weekly contamination wipes.

c) At least monthly, the RSO will perform (and document) a contamination wipe survey in all research rooms where radioactive material is used or stored.

d) All individuals authorized to use radioactive material in research areas will be trained on survey requirements in research areas. The training will include the survey frequency requirement, documentation of surveys, action levels associated with each type of surveys, and actions to be taken if action levels are exceeded. The training must be completed initially for new workers authorized to use radioactive material in research and repeated at least annually (or whenever the procedure is changed). The training material and documentation of training will be maintained onsite for future inspection. A copy of the training material is included in Attachment 2 for your review.

2. If there are any questions regarding the response, please contact at Frank Rutar, Director of Radiation Safety (RSO) for the University of Nebraska Medical Center, at (402) 559-4658.

NANCY A. GREGORY, FACHE

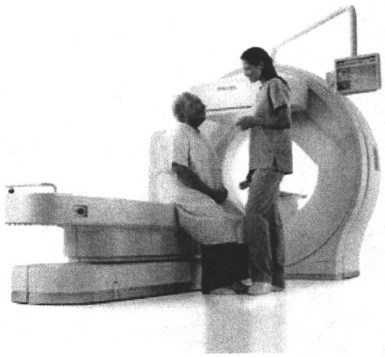
Enclosures: 2

Radiation Safety in Nuclear Cardiology

What is a Nuclear Stress Test?

A nuclear stress test measures blood flow to the heart while the patient is at rest and when the heart is under stress. It is similar to a routine exercise stress test, but provides images that can show areas of low blood flow through the heart as well as areas of damaged heart muscle.

A nuclear stress test usually involves taking two sets of images — one while the patient is at rest and one while the patient is exercising on a treadmill or with medication that stresses the heart. To create these images, a radioactive tracer (MyoView or Cardiolite) is injected into the patient's bloodstream through an intravenous (IV) line, usually in the arm. This substance mixes with the patient's blood and travels to the heart. The radioactive material used (Tc-99m) emits gamma rays (which are essentially like x-rays). A special scanner, called a gamma camera, detects these gamma rays and creates an image of the patient's heart muscle.



Gamma Camera

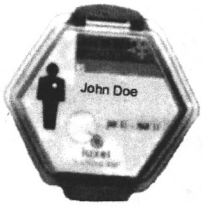
How Much Radiation Will I Receive?

This depends largely on how far away from the patient you are. We measure the radiation dose workers receive in units called **millirem** (**mrem** for short). At a distance of about 1 meter from the patient, the maximum dose rate is around 1 to 2 millirem per hour. In other words, if you were 1 meter from this patient for 1 hour you would receive 1 to 2 millirem. To put this into perspective, the average American receives about 1 mrem each day from natural background radiation (e.g., naturally occurring radiation in the air, soil, water, food). A typical dental x-ray is around 10 mrem.

The Nuclear Regulatory Commission (NRC) allows radiation workers to receive up to 5000 mrem each year. Using a conservative risk model, the health risk from 5000 mrem is comparable to the risk for workers who are in "safe" industry (e.g., office worker).

How will I know how much radiation I've received?

To monitor your radiation exposure, you will be given a radiation badge - called a dosimeter - to wear while you're working with nuclear cardiology patients. To wear the badge, simply clip it on somewhere on your front trunk area. A badge coordinator for your group will exchange radiation badges quarterly. The badges are sent to our badge vendor (Landauer) who reads them and sends a report to Radiation Safety. A copy of this report is sent to the badge coordinator in Cardiology.



Radiation Badge

Do I Have to Wear the Dosimeter Since the Radiation is so Low?

The VA is required to have employees primarily involved in the administration of nuclear stress tests (e.g., Holter tech, Nurse Practitioner, Cardiologist) to wear dosimeters during the procedure. For each nuclear stress patient, you must sign it on the "Cardiology Personal Dosimetry Verification Tracking Form" (shown on the next page). This form is reviewed by the Radiation Safety Officer (RSO) and regulators (e.g. Nuclear Regulatory Commission). An individual's access to radioactive material areas may be denied if dosimetry is not being worn.

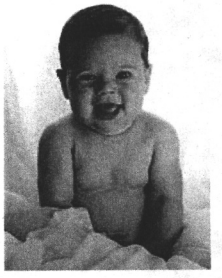
Radiation Badge Reports

The radiation badge that is used measures many different types of radiation dose. The radiation dose that is most pertinent for you is the **DDE** that is reported. The DDE (deep dose equivalent) is essentially your whole body dose (i.e., total radiation your body receives). As mentioned earlier, workers may receive up to 5000 mrem annually. Your dose is expected to be significantly less than this. In fact, it is common for ancillary staff to receive **M** (minimal) badge readings meaning that your badge received less than 1 mrem during the entire time it was assigned to you.

Storing Radiation Badges

For obvious reasons, when the radiation badges are not in use, they should be stored where they are NOT exposed to radiation. Also, if you lose your radiation badge contact your badge coordinator or Radiation Safety.

What if I'm Pregnant or Breastfeeding?



Pregnant workers may voluntarily enroll in the fetal monitoring program. In addition to your regular whole body radiation badge, you will be given a fetal badge which you wear on the front of your abdomen. Both of these badges are exchanged on a monthly basis. Because of concern for the fetus, the regulatory dose limit is **500 mrem for the entire gestation period**. The fetal badge reading will likely be close (or identical) to your whole body badge reading.

Individuals who are breastfeeding may continue to work with nuclear cardiology patients.

How can I minimize my Radiation Exposure?

The amount of radiation you receive depends on how far away you are from the patient & how long you are at that distance. The radiation emitted by the nuclear cardiology patient drops off significantly with increasing distance. For example, while the dose rate a meter away might be around 1 mrem per hour, the dose rate at 2 meters is only 0.25 mrem per hour (double the distance & the dose rate drops by a factor of 4). **Therefore, the best method to minimize your radiation dose is to minimize the time you spend near the patient.**

If you have any questions regarding radiation or your radiation dose, please contact the Radiation Safety Office.

Nebraska/Western Iowa Health Care System—Omaha

Cardiology Personal Dosimetry Verification Tracking Form

All Cardiology personnel participating in Nuclear Medicine Stress Tests are required to wear a Personal Dosimeter (Radiation Badge). To document this requirement, **for each patient** you are required to sign in below and your signature is your attestation to wearing a Personal Dosimeter to participate in this procedure.

Date & Time	Position?	Printed Name	Personal Dosimeter?	Signature
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
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	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	
	☐ Holter Tech ☐ NP ☐ MD		☐ Yes ☐ No	

Completed sheets are to be sent to the Cardiology Manager (111C)

Acknowledgement Form
Radiation Safety in Nuclear Cardiology

I hereby acknowledge that I have read and understood the material contained in the *Radiation Safety in Nuclear Cardiology* training handout. I understand that I am required to wear radiation dosimetry when participating in nuclear cardiology procedures and must sign in on the Cardiology Personal Dosimetry Verification Tracking Form for each patient.

Print Name: _____

Signature: _____

Date: _____

2011 Radiation Safety Training
For Research Laboratory Personnel

The Nuclear Regulatory Commission (NRC) recently completed an inspection of the radioactive material license for the Nebraska/Western Iowa Health Care System-Omaha. **While no items of non-compliance were identified, the NRC did note some concerns regarding the use of radioactive material in the research laboratories.**

For this year's annual radiation safety training for Authorized Users and radiation workers in research laboratories that use radioactive material, the material will focus on the NRC concerns and new requirements that will be implemented to address these. The training material has been broken down into the following sections:

- Security of Radioactive Material
- Inventory Control
- Instrument Surveys
- Contamination Wipe Surveys

Important points or new requirements that are to be implemented with be indicated with **red bold-face font.**

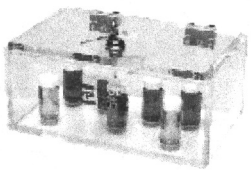
At the end of this training material is a short multiple choice test is attached for you to complete. A passing score of 80% is required to continue to work with radioactive material (RAM).

Security of Radioactive Material

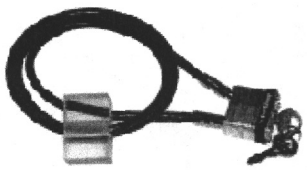
Securing Radioactive Material

In accordance with regulations (10 CFR 20.1801 and 20.1802), radioactive material must be properly secured from unauthorized access at all times. Acceptable methods of securing material include the following:

- Locked room.
- Locked storage unit such as a lockable refrigerator, freezer, and cabinet.
- Using a lock box that is secured (e.g., container restrainer) within a refrigerator or freezer. If you typically frequent the refrigerator throughout the day and/or are in an open laboratory setting (e.g., several researchers in a large room) the locked box may be the more convenient method of securing material.



Lock box



Container restrainer

- Direct Control: If radioactive material is unsecured (e.g., in use) an individual authorized to work with radioactive material must have **direct** control of the radioactive material.

If you have any questions regarding the proper storage of radioactive material, please contact the Radiation Safety Officer (Mike Christensen) at extension 3440.

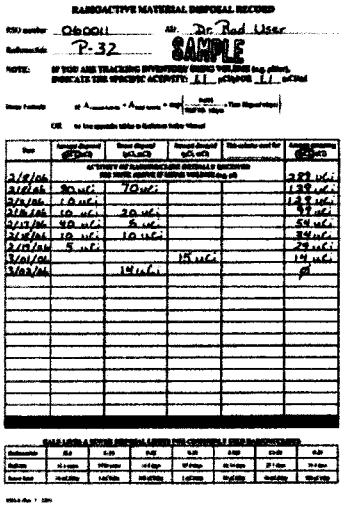
Who Do You Contact Regarding Security Incidents or Suspicious Activities?

Any on-campus occurrences involving radioactive material should be reported to VA Police at 3333.

Inventory Control of Radioactive Material

Keeping track of radioactive material is a necessary component in the security of radioactive material.

- As radioactive material is used, an internal record must be updated indicating the amount of radioactive material used. It is recommended that the yellow RSO-8 (Radioactive Material Receipt and Disposal Record form) be used to document usage. The usage of radioactive material (including disposal) needs to be updated on the day of use.


RADIOACTIVE MATERIAL DISPOSAL RECORD

SAMPLE

- After you've used all the radioactive material (i.e., zeroed out on the RSO-8 form) send the RSO-8 form to the Radiation Safety Office – You do **NOT** have to wait for Radiation Safety to pick up the waste before sending the RSO-8 form in.

- When waste containing a large amount of activity is generated, the waste containers need to be secured (e.g., lockable cabinet) or you need to contact Radiation Safety to come immediately to pick up the waste (NOTE: You do not have to wait for the container to get filled to have a pickup made).

- All packages containing radioactive material must be delivered to the Radiation Safety Office.

- **Beginning June, the Radiation Safety Officer (RSO) monthly will send each Authorized User an "Inventory Verification Report" which indicates the current inventory of their radioactive material on file. The Authorized User is required to review this inventory for any discrepancies and will sign and return to the RSO.**

- Quarterly, the RSO will perform an audit to visually confirm the all active inventory on file with the radiation safety office.

Instrument Surveys

Administrative Requirements

How Often Do I Need to Perform an Instrument Survey?
At a minimum, an instrument survey for contamination is performed at the end of each working day that you use radioactive material. In addition, an instrument survey must be performed after an incident where potential contamination of radioactive material is involved (e.g., spill).

What is the Action Level When Performing an Instrument Survey?
When radiation levels are **two times or greater than normal background levels.**

What if the Radiation Levels are Above the Action Level?
If the instrument survey indicates radiation levels above the Action Level, decontaminate the surface and resurvey. If unable to decontaminate to below the Action Level contact the RSO.

Do I Need to Document Instrument Surveys?
Beginning on June 1st, labs will be required to document instrument surveys. An "Instrument Survey Log" form for each Authorized has been created to document these surveys (an example form is provided at the end of this section). You will only need to complete documentation on days surveys are performed (e.g., days radioactive material is used).

How to Use the Survey Meter

How Do I Know My Survey Meter is Functioning Properly?
Before using a survey meter, a Pre-Operational Check needs to be performed to verify that the meter is functioning properly. The Pre-Operational Check consists of the following 3 steps:

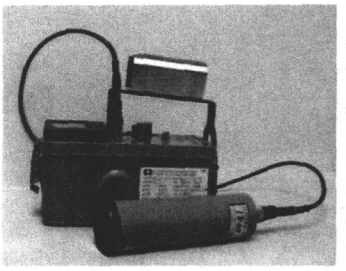
a) Check the calibration due date on the calibration sticker attached to the meter and make sure it isn't past due.
b) Perform a battery check (usually involves simply turning the meter toggle to BAT and make sure that the needle goes into the BAT OK region).
c) Put the probe (without its cover if it has one) against the check source (typically a small disc source or gas mantel taped to the side of the meter). Make sure that the meter reads within the cpm range indicated on the calibration sticker.

What Should I Do if my Battery Check Indicates that the Batteries are Low?
Simply replace the batteries yourself. The survey meter does **NOT** need to be sent to Radiation Safety for recalibration (e.g., battery changeout is not considered servicing). Should you have any questions regarding changing the batteries, contact the Radiation Safety Office.

What Should I Do if I Place the Probe on the Check Source and the Meter Reading is OUTSIDE the range given on the Calibration Sticker?
Should the meter reading fall outside the range given on the calibration sticker, recalibration is required and the meter should not be used.

Can survey meters detect all types of radioactivity?
Most survey meters can detect the radiation emitted by the many of the radionuclides used at the Omaha VA. However, the following exceptions should be noted;

- Because of its low beta energy, H-3 cannot be detected by a survey meter (only contamination wipes counted with a liquid scintillation counter can be used to monitor for H-3 contamination).
- For detection of I-125 (which emits very low energy gammas), a low energy NaI probe (e.g., Ludlum 44-3) should be used. A GM pancake or end window probe is not appropriate for I-125 detection.



Survey meter with a low energy NaI probe

Instrument Survey Log – Dr. Radman License

1) Instrument surveys are to be performed at the end of each day of radioactive material (RAM) use or after any contamination event (spill).
2) Only rooms/areas where RAM was used are required to be surveyed. **The Action Level is two times the background meter reading.**
3) If above this Action Level, decontaminate and resurvey. If levels cannot be brought down below the Action Level, contact the RSO.

Date	Initials	Rooms Surveyed	Meter[1]	Bkg (cpm)	Survey Results	Comments
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	
		☐ 2333 ☐ 2335 ☐ 2336A	1		☐ < Action Level ☐ > Action Level (contact RSO)	

NOTES: 1- Ludlum Model 3 Survey Meter (S/N 12866)

Contamination Wipe Surveys

Administrative Requirements

How Often Do I Need to Perform a Contamination Wipe Survey?
In accordance with guidance by the VA's National Health Physics Program, **a contamination wipe survey must be performed at least weekly if radioactive material was used. Only rooms where radioactive material was actually used need to be wiped.**

The RSO will perform a confirmatory monthly wipe survey in all rooms where radioactive material was used or stored during that past month.

How to Perform/Document Contamination Wipes

For each Authorized User (AU), the Radiation Safety Office has created a "Laboratory Contamination Survey" form. This is the form we would like labs to use to document their contamination wipe surveys. On each form are the Authorized User's name and all the rooms that are on that AU's radioactive material license. The form also provides Step by Step instructions for performing the contamination wipe survey, which is as follows:

1. **Perform Survey**: Using absorbent material (e.g., filter paper, q-tips) use moderate pressure to wipe an area of at least 100 cm^2 on surfaces where radioactive contamination is most likely to occur (e.g., benchtops where radioactive material was used & adjacent floor). You can approximate this area by making a "figure-8 "over the size of a dollar bill (or palm of your hand).

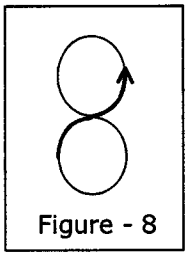


Figure - 8

2. **Count Wipes:** All the radionuclides used in research at the Omaha VA can be counted for radioactive contamination using the liquid scintillation counter (LSC). Iodine-125 (I-125) may also be counted using a gamma counter. When counting on either machine, make sure that one of the vials does not contain any radioactivity so it can be used as the background count.

3. **Review Count Results**: The **action level is 220 dpm above background.** Since the LSC only prints out results in cpm, you can use the table on the form (shown on the next page) to determine a cpm action level (Note: if you use more than one radionuclide & using an open window to count all energies, you must go with the lowest action level).

Radionuclide	Typical Efficiency	Action Level
C-14, P-32, P-33, S-35, I-131	> 95%	209 cpm above background
I-125	78%	172 cpm above background
H-3	60%	132 cpm above background

If any **area is > 220 dpm**, the area must be decontaminated and reswiped until the counts are < 220 dpm.

Contamination Action Level = 220 dpm above Background

Example: You use the LSC to count contamination wipes. Your lab is currently using H-3. The highest wipe count was measured at 140 cpm and the background was 30 cpm. Were you above the action level?

The highest count was 110 cpm above background (140-30). Looking at the table above, you can see that the action level is 132 cpm above background and, therefore, you are below the action level.

4. **Document Results: For each Authorized User a "Wipe Survey Log" form has been created to document wipe results (an example form is shown on the next page).** Remember, wipes do NOT need to be performed if no radioactive material was used during that week (some researchers may wish to use this form to document no RAM was used during the week).

If any wipes are greater than the action level, decontaminate and reswipe until contamination action level is met (indicate decontamination performed in the comments section).

Place the Laboratory Contamination Survey form and survey results (**INCLUDING** any decontamination swipe results) in the survey section of your Radioactive Material Records book.

Nebraska/Western Iowa Health Care System—Omaha

Wipe Survey Log – Joe Radman, Ph.D.

Instructions:

1. Wipes must be performed weekly if radioactive material (RAM) was used. You are NOT required to document if no RAM was used (however, you may do so if desired).
2. Survey swipes are to be taken over a minimum area of 100 cm^2 area (e.g., size of a dollar bill).
3. Be sure to count a blank sample to be used as the background count (bkg).
4. Review the printout results. **Action level is 220 dpm above background.**

   If your results are in cpm, the dpm can be calculated as follows:
   dpm = (Sample cpm – Background cpm) ÷ (Counter Efficiency).

   For liquid scintillation counters you may use the following table to determine if any areas are above the Action Level of 220 dpm above background counts:

Radionuclide	Typical LSC Efficiency	Action Level (above bkg)
C-14, P-32, S-35, I-131, Ca-45	> 95%	209 cpm
I-125	78%	172 cpm
H-3	60%	132 cpm
Cr-51	35%	77 cpm

   Any areas > 220 dpm need to be decontaminated and reswiped until the count(s) are < 220 dpm.

5. Check the appropriate column:

Date of Wipe	Instrument (see below)	Rooms Surveyed	Wipe Results	Comments	Initials
		☐ 222 ☐ 223 ☐ 224A	☐ All wipes < 220 dpm ☐ Wipes > 220 dpm		
		☐ 222 ☐ 223 ☐ 224A	☐ All wipes < 220 dpm ☐ Wipes > 220 dpm		
		☐ 222 ☐ 223 ☐ 224A	☐ All wipes < 220 dpm ☐ Wipes > 220 dpm		
		☐ 222 ☐ 223 ☐ 224A	☐ All wipes < 220 dpm ☐ Wipes > 220 dpm		
		☐ 222 ☐ 223 ☐ 224A	☐ All wipes < 220 dpm ☐ Wipes > 220 dpm		
		☐ 222 ☐ 223 ☐ 224A	☐ All wipes < 220 dpm ☐ Wipes > 220 dpm		
		☐ 222 ☐ 223 ☐ 224A	☐ All wipes < 220 dpm ☐ Wipes > 220 dpm		
		☐ 222 ☐ 223 ☐ 224A	☐ All wipes < 220 dpm ☐ Wipes > 220 dpm		

Instruments: 1 – LSC Packard 1600TR (S/N 103960) 2 – LSC Packard 2100TR (S/N 418061)
3 – COBRA II Packard (S/N 405968) 4 – Wizard Perkin Elmer (S/N 4800422)

6. File this form and survey results (e.g., LSC printout), including all decontamination swipe results, in a file that can be easily obtained and audited by inspectors.

Any questions, call the Radiation Safety Office (ext. 3440)

2011 Annual Radiation Worker Training (Research)

Select the best answer to the following questions. A score of 80% is required to continue working with radioactive material. Please return to the Radiation Safety Officer (Michael Christensen) when completed. As an alternative to returning the form, you may email your answers to Michael.Christensen@va.gov.

Name: _____ Signature: _____

1) Besides incidents involving radioactive material (e.g., spills), how often do instrument surveys need to be performed?
   a) Monthly
   b) Weekly
   c) At the end of each day of radioactive material use

2) What is the action level for instrument surveys?
   a) 220 cpm
   b) Twice the background level
   c) 1000 cpm

3) Do instrument surveys need to be documented?
   a) Yes
   b) No

4) Besides contamination situations (e.g., spills), how often do contamination wipes need to be performed?
   a) At the end of each day of radioactive material use
   b) Weekly, no matter if radioactive material was used or not
   c) Weekly, only if radioactive material was used that week

5) What is the action level for contamination wipe surveys?
   a) 220 dpm above background
   b) 220 cpm
   c) Twice the background level