



DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY MATERIEL COMMAND
9301 CHAPEK ROAD, FORT BELVOIR, VA 22060-5527

REPLY TO
ATTENTION OF

AMCPE-SG-R (11-9h)

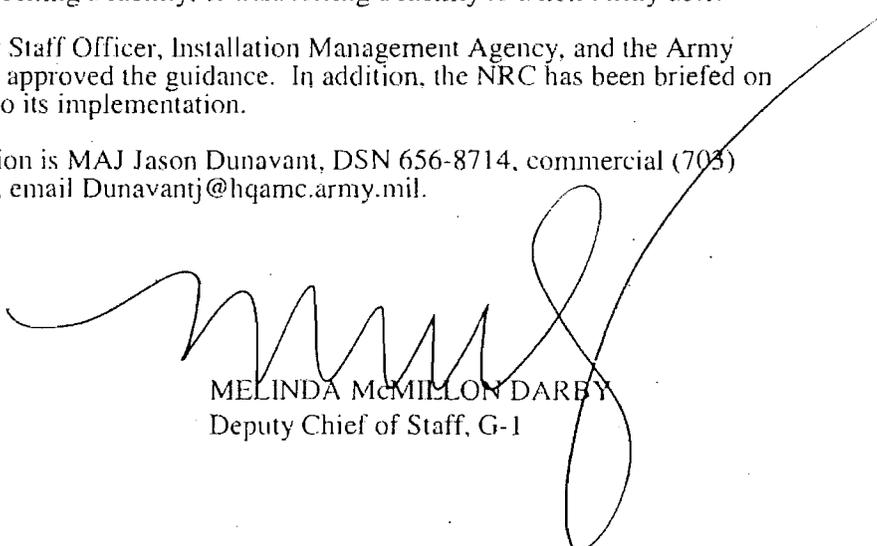
05 APR 2004

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Guidance on Radiological Decommissioning Survey for Areas where U.S. Nuclear Regulatory Commission (NRC) Licensed Commodities Were Used.

1. Reference. Minutes, Army Radiation Safety Council, 11 February 2004.
2. Attached is the updated guidance on decommissioning radiological surveys. This guidance will affect areas where Army Materiel Command (AMC) managed NRC licensed commodities or managed radium containing commodities were stored, used, or maintained. We request all users of AMC radioactive commodities and managers of US Army property where AMC radioactive commodities were used, stored, or maintained to follow this guidance when decommissioning Army facilities.
3. Please follow the attached survey guidance during planning, performing, or documenting phases. This is part of the radiological decommissioning efforts to release facilities for "unrestricted release." Unrestricted release approval allows the Army to give up control of a facility by terminating a lease, selling a facility, or transferring a facility to a non-Army user.
4. The Army Radiation Safety Staff Officer, Installation Management Agency, and the Army Radiation Safety Council have approved the guidance. In addition, the NRC has been briefed on the guidance and is agreeable to its implementation.
5. Point of contact for this action is MAJ Jason Dunavant, DSN 656-8714, commercial (703) 806-8714, fax (703) 806-8859, email Dunavantj@hqamc.army.mil.

FOR THE COMMANDER:



MELINDA McMILLON DARBY
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AMCPE-SG-R

SUBJECT: Guidance on Radiological Decommissioning Survey for Areas where U.S. Nuclear Regulatory Commission (NRC) Licensed Commodities Were Used

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DEPARTMENT OF THE ARMY
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- GUIDANCE -

Radiological Surveys for Areas Where
NRC-Licensed Commodities or Radium Containing Commodities Were Present
February 2004

1. **BACKGROUND.** The history of many Army and non-Army sites includes the long term storage and maintenance of radioactive commodities. Examples of Army radioactive commodities include lensatic compasses, depleted uranium (DU) munitions, radio-luminescent sights and gauges on tank and mortar muzzles, moisture density gauges, etc. Some of these commodities are/were used, stored, and repaired under commodity licenses issued to the Army Materiel Command (AMC) by the Nuclear Regulatory Commission (NRC). This guidance is being issued to provide direction on how these commodity areas shall be surveyed to meet the NRC requirements for unrestricted release. In the case of Base Re-alignment and Closure (BRAC) sites and Formerly Used Defense (FUDS) sites, it is anticipated that this guidance will also satisfy any concerns of the Environmental Protection Agency (EPA), as well as the host states. In the case of OCONUS sites, it is anticipated that this guidance will satisfy any concerns of the host nation. Examples of the application of this guidance are attached as an Appendix.

2. **APPLICABILITY.** This guidance shall be applied to sites where NRC-licensed radioactive Army commodities or Army radium containing commodities were stored (long-term), repaired, or potentially involved in cannibalization, demilitarization, or burial operations. These sites include Army, Army Reserve, National Guard, other government agencies, tenants, and contractor sites covered under an NRC radioactive commodity license held by the Army. This may include commodity areas on an active site, BRAC site, FUDS site, Defense Environmental Remediation Account (DERA) site, a contractor site, or OCONUS foreign host site. This guidance might also be applied to contractor sites where Army radioactive commodities items were manufactured, repaired, maintained, or stored under an NRC license issued to the contractor, but only if approval is first gained from the NRC Regional office.

3. **IMPLEMENTATING PARTIES.** These surveys may be conducted by the Installation Management Agency (IMA), the mission organization that required the presence of the radioactive commodities, the licensee identified in Table 1, or a combination thereof. IMA as the land and building owner, the mission organizations as the commodity user and the licensee each have a vested interest in surveying commodity areas before they are released. It is anticipated that all parties will work together to ensure this. It is important for IMA and the mission organization to fully understand and appreciate that failure to perform and document these surveys could jeopardize the Army's ability to field radioactive commodities that are vitally important to our success on the battlefield. If the Army fails to meet the NRC survey requirements as described in this guidance, AMC could lose its authority to field these items. If

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a conflict as to who should or will perform these surveys arises, contact the licensees and AMC RSSO in Table 1 as early as possible so resolution can be pursued.

4. PURPOSE. This guidance is necessary to ensure that unrestricted area release survey efforts are commensurate with the use, design, and relative risk posed by radioactive commodity items. Army radioactive commodities are rugged, with a limited amount of the radionuclide in a non-dispersible form. Army radioactive commodities are not expected to have contaminated areas, furniture, or equipment where they were present. Unless contamination is known to exist or is found during surveys, these sites are considered Group 1 sites as described in NUREG 1757, Consolidated Decommissioning Guidance.

5. GENERAL APPROACH. For areas that will remain under the control of the Army, surveys of commodity sites will be "routine release surveys". For surveys that will be used to release commodity areas from further Army control (e.g. BRAC, FUDS, foreign sites), surveys will be "final" release surveys. Instructions in this guidance for "final" surveys have been formulated following NRC NUREG-1757 (Consolidated Decommissioning Guidance) and NRC NUREG-1575 (Multi-Agency Radiological Survey and Site Investigation Manual - MARSSIM) with the limitations and conditions specified. This guidance is considered consistent with MARSSIM Appendix B, "Simplified Procedure for Certain Users of Sealed Sources, Short Half-Life Materials, and Small Quantities", and NUREG 1757 "Alternative Simplified Method" for non-leaking sealed sources.

6. TYPICAL PROCESS FOR AREAS THAT WILL LEAVE ARMY CONTROL. The closing site will solicit Radiation Safety expertise to conduct surveys following this guidance. If contamination is expected, contact the licensees identified in Table 1 for further direction because the effort will require experienced decommissioning personnel and will be beyond the scope of this guidance. On the other hand, when no radioactive contamination is expected, the areas are classified as Class 3, and a unit, local, or installation level Radiation Safety Officer (RSO) may be able to perform the final surveys using this guidance and assistance from the radioactive commodity licensees identified in Table 1. Steps typically include: (1) performing and documenting a Historical Site Assessment (HAS), (2) formulation of survey plans (3) determination of the NRC's Default Derived Concentration Guideline Levels (DCGL) for release of the site, (4) in the case of BRAC and FUDS sites, coordination of survey plans and release limits with the host-state and EPA, (5) in the case of OCONUS sites, coordination of survey plans and release limits with the host-nation, (6) performance and documentation of final surveys, and (7) filing the HSA and survey results at the unit, installation, licensee and AMC levels. See the attached Appendix for implementation examples.

a. COORDINATION. For BRAC and FUDS sites, the host-state and EPA must be briefed on this survey guidance and the final survey plan and DCGL's before surveys begin. For OCONUS sites, the host-nation must be briefed on this survey guidance and the final survey plan and DCGL's before surveys begin. Although conflicts with the states, host nation, or EPA

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are not expected, they will be referred to the licensees and HQ AMC Radiation Staff Safety Officer (RSSO) for resolution if they do occur.

b. AREA CLASSIFICATION. A HSA will be conducted to identify areas where NRC-licensed or radium containing commodities were stored (long-term), repaired, cannibalized, or buried. A review of the type of operation, as well as any history of accidents, incidents, and leak tests will be considered to classify areas. Any routine surveys as well as any release surveys previously conducted in the area will also be considered. Commodity areas will be classified as follows:

(1) Non-impacted - The following storage areas will not require any surveys:

- (a) Short-term temporary storage areas,
- (b) Where individual item activity did not require posting as a "Radioactive Material" area per 10CFR20.1902, 20.1903(c)
- (c) Where generally licensed items such as smoke detectors and exit signs were present
- (d) Where a specific NRC license condition relieved the "Radioactive Material" posting requirement for bulk storage (example, less than 1000 tritium compasses)
- (e) Where armored vehicles with intact DU shielding were present, and
- (f) Where sealed NRC licensed commodity items were present, and leak testing indicated no source leakage.

It will still be necessary however, to document the areas considered on Form 1 and to justify why no surveys were performed.

(2) Class 3 - Most radioactive commodity areas that can not be classified "Non-impacted" will be classified as Class 3. Where historical information indicates an accidental release occurred but has already been cleaned to present day standards for unrestricted release, the area can also be classified as Class 3.

(3) Class 1 and Class 2 - These classifications are for areas where there is known contamination. This would most likely occur in commodity repair and maintenance areas, radioactive waste areas, and cannibalization and demilitarization areas. It might also occur where a commodity was known to have been broken and leaked, and in areas where an accidental release occurred in the past that has not been cleaned to present day standards. As stated earlier, when radioactive contamination is expected (Class 1 or Class 2) experienced

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decommissioning personnel will be required, and a rigorous application of MARSSIM beyond the scope of this guidance will be required. In this case, contact the licensees in Table 1 for further directions.

c. FINAL SURVEYS

(1) RANDOM SAMPLING OF BUILDING SURFACES. Building surfaces of concern are the floor and the walls to a height of 2 meters above the floor. For Class 3 areas, random sampling will be used to eliminate the need for gridding and moving furniture. As permitted by MARSSIM Appendix B and NUREG 1757, thirty (30) random locations can be used to cover each survey unit. A survey unit is an area or group of areas (not exceeding 2000 square meters) with a similar history and the same contamination potential. A survey unit can be a room or group of rooms that have the same history of use and contamination potential. If all 30 locations measure below the release limit, the MARSSIM statistical tests are not required to demonstrate compliance.

(2) WIPE TESTING OF BUILDING SURFACES. Each of the 30 random locations will be wipe tested for removable contamination. Contact the licensees identified in Table 1 to obtain wipe test supplies and instructions. If tritium containing commodities were present, special tritium wipes will be required.

(3) STATIC MEASUREMENTS ON BUILDING SURFACES. Each of the 30 random locations will be monitored with a thin window pancake-type probe held within 1 cm of the surface. Contact the licensee identified in Table 1 for guidance selecting an appropriate instrument and counting mode (count rate vs. integrated count). The level detected at each random location will be compared to the level in a "background area", ie, an area of similar construction with no radioactive material or radioactive commodity history. The results will be recorded on Form 2. If any levels noticeably exceeding background are detected, immediately notify the licensees identified in Table 1.

(4) SCANNING. The alpha emitting and gamma emitting radioactive commodities are subject to periodic leak testing. In the absence of a history of alpha or gamma source leakage, scanning for alpha or gamma radiation is therefore not required. Most of the radioactive commodities that are not periodically leak tested use low energy beta emitters. Scanning for low energy beta emitters is not feasible. Scanning will therefore not be required for H-3 (Tritium), Pm-147, or Ni-63 commodities area. In the absence of expected or known Depleted Uranium contamination, scanning for DU is not considered feasible. If, however, contamination is known or expected to exist in an area, the area will be classified as Class 1 or 2, and scanning will be performed as part of a more extensive effort beyond the scope of this guidance.

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(5) FURNITURE AND EQUIPMENT. If the furniture and equipment are still present in the area, they will also be surveyed. The furniture and equipment in a survey unit will likewise be covered with 30 sample locations. Since it is difficult to identify random locations on furniture and equipment with odd shapes, NUREG 1761 recommends the use of biased sampling, ie, locations most likely to be contaminated. This would include the surfaces of tables, shelves, drawers, etc., that were in direct contact with the commodities. As with the building surfaces, wipe tests and static measurements will be made for each location, and documented on Form 2.

(6) DRAINS/VENTS/DUCTS. Wipe testing and static measurements of drains, vents and ducts is not required in Class 3 areas.

(7) CHARACTERIZATION SURVEYS. Characterization surveys are not required in Class 3 areas.

(8) VERIFICATION SURVEYS. Verification surveys are not required in Class 3 areas.

d. INSTRUMENTATION. Instruments and methods chosen shall be capable of detecting 25% of the DCGL for release of buildings and 50% of the DCGL for release of grounds.

e. REPORTING. Each unit/local/installation RSO or tenant RSO will notify the AMC RSSO IAW AR 11-9 (para 1-4(3)) when a building or area that currently or formerly contained radioactive commodities is scheduled for demolition or will no longer contain radioactive commodities. The AMC RSSO will then notify the radioactive commodity license holders to ensure survey efforts fulfill the requirements of this guidance, and to ensure the NRC is notified as appropriate.

(1) For Class 3 commodity areas (no history of contamination) the NRC does not need to be notified of impending shutdown or change in operational status. The NRC also does not need to be informed that surveys will be conducted in Class 3 commodity areas, or of the results of the survey, unless contamination is found. But records of the HSA and any surveys performed in a Class 3 commodity area must be filed at the unit, Installation, AMC, and commodity licensee level. This information may be required at a later date to demonstrate to the NRC that the area was properly released

(2) NRC has advised that notification of the NRC is required when areas are expected to be, or are, contaminated (Class 1 or Class 2). In this event, within 60 days of a decision to permanently cease commodity activities in such an area, or if no commodity activities have been conducted in such an area for a period of 24 months, the licensee must notify the NRC that the decommissioning process has begun, or within 1 year submit a

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decommissioning plan. See Title 10 Code of Federal Regulations (CFR) Part 30.36 for further reference. To support these efforts, the unit/local/installation RSO will be required to provide the commodity licensee with the history of past commodity uses, contamination events, commodity inventories, and routine survey records for the areas to be released.

7. TYPICAL PROCESS FOR AREAS THAT WILL NOT LEAVE ARMY CONTROL.

Routine release surveys will be required so the area can return to unrestricted use.

a. **COORDINATION WITH REGULATORS.** Coordination with regulators is not required unless required by sub para e below.

b. **AREA CLASSIFICATION.** The radioactive commodity area will remain classified as "restricted" until routine release survey results demonstrate compliance with "unrestricted area" contamination levels as defined in NRC regulatory guidance, Army regulation (AR 11-9) or the conditions of the commodity license.

c. **ROUTINE RELEASE SURVEYS.** Formal conduct of the MARSSIM process, to include the HSA, area classification, derivation of DCGLs, and final surveys is not required. This extensive, expensive, and formal process may be required at a later date when transfer of the area from Army control is planned. But for a routine release survey, the selection of 30 random measurement locations per survey unit for building surfaces and 30 locations for the furniture and equipment in each survey unit is still encouraged.

d. **INSTRUMENTATION.** As a matter of standard practice, instruments and methods chosen for the routine release surveys shall be capable of discerning the release limit in the presence of background radiation.

e. **REPORTING.** Each unit/local/installation RSO and/or tenant RSO will notify the AMC RSSO IAW AR 11-9 (para 1-4(3)) when a building or area that currently or formerly contained radioactive commodities is scheduled for demolition or will no longer contain radioactive commodities. The AMC RSSO will then notify the radioactive commodity license holders to ensure that survey efforts fulfill the requirements of this guidance, and to ensure the NRC is notified as appropriate. For Class 3 commodity areas (no history of contamination) the NRC does not need to be notified of impending shutdown or change in operational status. The NRC also does not need to be informed that surveys will be conducted in Class 3 commodity areas, or of the results of the survey, unless contamination is found. NRC has advised that notification of the NRC is required when areas are expected to be, or are, contaminated (Class 1 or Class 2). In this event, within 60 days of a decision to permanently cease commodity activities in such an area, or if no commodity activities have been conducted in such an area for a period of 24 months, the licensee must notify the NRC that the decommissioning process has begun, or within 1 year submit a decommissioning plan. See Title 10 Code of Federal Regulations (CFR) Part 30.36 for further reference. To support these efforts, the

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unit/local/installation RSO will be required to provide the commodity licensee with the history of past commodity uses, contamination events, commodity inventories, and routine survey records for the areas to be released.

8. RECORDKEEPING. Each unit, local, and IMA installation RSO, and commodity-using tenant RSO will maintain decommission records of radioactive commodity locations, leakage/contamination incidents, and routine survey results, as required by AR 25-400-2, under file designation 11-9p.

9. CHANGES .Any change to this guidance must first be approved by HQ AMC. To request a change, contact the AMC RSSO. HQ AMC is interested in any suggestions for improving and refining this guidance. Please provide suggestions to Michael Borisky, DSN 290-6310 or commercial 301-394-6310. For assistance interpreting and apply this guidance, contact Michael Borisky, the AMC RSSO, or the commodity licensee.

10. APPLICATION: For examples of the application of this guidance, see Appendix 1 attached.

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APPENDIX 1
EXAMPLES / PROCEDURES

EXAMPLE 1 – An Army Reserve Center is going to move its arms room to another location within the Reserve Center. The arms room currently includes NRC-licensed radioactive commodity items. What needs to be done so the arms room can be released for unrestricted use?

(1) The unit, local, or IMA installation RSO reviews what is currently being stored in the arms room. He finds that there are 6 M4 Front Sight Post assemblies, a Chemical Agent Monitor, a MX-7338 Radiac Check Source, a Th-232 check source within an AN/PDR 77 Radiac Set, an Explosive Detector, and an MC-1 Moisture Density Gauge. He also finds 10 radio luminescent lensatic compasses, 10 radio luminescent wrist watches, and radio luminescent sights on 12 M-16 rifles, and 12 pistols. And someone at the reserve center decided to store defective smoke detectors that are labeled as containing radioactive material. He records this information on Form 1 as part of his Historical Site Assessment.

(2) He then checks files and talks with personnel to determine whether the arms room was ever used to store any other radioactive materials or radioactive commodity items. He finds 10 years ago, the arms room was used to store some DU rounds. He also records this information on Form 1, as well as the file number and year of any records he reviewed, and the name of any personnel he talked to. He is now confident he knows what radioactive items were present in the arms room.

(3) In accordance with AR 11-9 (para 1-4(3)) he notifies the AMC RSSO that his unit is planning to permanently vacate the area of radioactive commodities. The AMC RSSO asks him what commodities were or are present, and informs those AMC major subordinate commands (MSC's) that hold the NRC licenses for the commodities.

(4) The RSO then plans his survey efforts. He references Table 1 to determine what commodities contain what, which ones are NRC-licensed, and what surveys are needed. From this guidance, he knows that items that are generally licensed or that are license exempt do not require a survey. This includes the Th-232 check source in the ANPDR-77 radiac set, the explosive detector, the lensatic compasses, the wrist watches and the pistol and rifle sights. So if it only these items were present in the arms room, no survey would be necessary. But what about the CAM/ICAM, the MC-1, and the M4's? These items are labeled as radioactive with specific NRC licenses issued to the Army. They are therefore neither license exempt nor generally licensed, and therefore require a survey, unless a sealed source that was periodically leak tested with no leakage detected. So the RSO checks his files, and coordinates with the license manager for the CAM (TACOM-Rock Island) and the MC-1 (TACOM-Warren) and finds that these have been leak tested periodically, and there has never been any leakers. So no

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survey is required for these, and he documents on Form 1 who he spoke to and the records that indicated no leakage.

(5) So that leaves only the DU munitions and M64's as potentially requiring a survey of the arms room. Since the DU munitions and M64 are NRC licensed to the Army, and because they are not periodically leak tested, a survey will be required to confirm that they didn't contaminate the arms room. The RSO must then decide upon a classification of the area. Since his review of Reserve Center records and discussion with personnel indicated there had never been a broken M64, no contamination is expected, and the arms room is therefore classified as a Class 3 area.

(6) The RSO through discussion with the NRC-license manager at TACOM-Rock Island learns that the proper way to survey for H-3 contamination, is with wet wipes wiped over about 4 inches by 4 inches for each wipe test. With the help of the licensee, the RSO therefore arranges for 30 wet wipe tests for the floor and walls, and 30 wet wipes for the furniture and equipment in the room. And the RSO learns from JFSA that the proper way to survey for DU contamination is with dry wipes, so he also arranges for 30 dry wipes for the floor and walls, and 30 dry wipes for the furniture and equipment in the room.

(7) While the wipes are en-route from the NRC-license managers, the RSO chooses 30 random locations on the arms room floor and walls. He also chooses 30 locations on the furniture and equipment in the area where contamination would be most likely, such as the shelves and table tops and cabinets where the commodities were stored. He marks and labels each test location on the floor, walls, furniture, and equipment. Since the area is a Class 3 area, no wipes are required on any ventilation ducts, or drains. The RSO draws the room on Form 2, and provides reference numbers for each wipe test location. He also sketches the furniture and equipment in the room on Form 2, and provides reference numbers for each wipe test location.

(8) The RSO now contacts the commodity licensees identified in Table 1 for guidance on what instrument and counting mode to use for conducting static measurements. Measurements are then made holding the probe within 1 cm of the surface of the floor, walls, equipment, and furniture, taking readings at each sampling location. He records the reading for each location. The RSO also takes readings from 20 different locations in an area of similar construction, and records these readings as "background" readings on Form 2. If any locations are twice as high as the average of the background readings, the RSO would immediately contact the licensee identified in Table 1.

(9) The wipes arrive from the NRC-license managers and the RSO wipes a 4 inch by 4 inch square at each sample location, once for the wet wipe, and once for the dry wipe, being careful the two squares do not overlap. The RSO follows the instructions with the wipes, and returns them to the NRC-licensee or designated lab for counting. Test results are returned that indicate that all wet wipe readings are below the instrument minimum detectable activities of 150

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dpm/100cm² for H-3 (tritium) and 15 dpm/100cm² for DU. The RSO compares this to the release limits in Table 5-2 of AR 11-9, of 10,000 dpm/100cm² for tritium (H-3) and 1,000 dpm/cm² for DU. None of the wipe test taken exceeded the release limits.

(10) Since the wipe test results are below the release limits, and the cpm readings are all below twice the background reading, the RSO thinks the area is probably suitable for release. To make sure, he sends Form 1 (Historical Site Assessment) and Form 2 with all wipe test and meter reading results to the licensee identified in Table 1 for the DU munitions and the M64's. He also sends a copy to the AMC RSSO, and ensures a copy is filed in the Reserve Center files, 11-9p, Decommissioning Records. Upon receipt, the licensee will review the survey, and determine whether free release is permissible.

EXAMPLE 2 – The RSO in example 1 reviews the wipe test results, and finds that the wet wipes show a few locations on a storage shelf where the H-3 contamination level was about 700 dpm/100cm², which is above the instrument minimum detectable activity of 150 dpm/100cm², but below the AR 11-9 release limit of 10,000 dpm/100cm². Even though the measured levels are below the AR 11-9 release limit, the RSO contacts the license manager for the H-3 items (TACOM Rock Island) as the 700 dpm/100cm² suggests some contamination that might be further evaluated as directed by the licensee.

EXAMPLE 3 – The RSO in example 1 reviews the stationary meter readings and finds one that reads 75 cpm, which is over twice the “background” reading. The RSO immediately contacts the licensee for further guidance.

EXAMPLE 4 – If in example 1 the Reserve Center was going to be transferred under BRAC to the local community, everything would remain the same (as in example 1) except that the RSO would need to discuss the history of radioactive commodity use, the survey unit classifications, and the planned survey methods and DCGL's with the Restoration Advisory Board (RAB) and the host state. The RAB includes individuals from the Army MACOM Real Estate Office, the state radiation safety office, as well as the local community. The federal EPA and state environmental agency may also be on the RAB. It is imperative that everyone be informed of what is planned. RAB members may request different survey procedures and DCGL's. This is a negotiated process. If resolution does not look reasonable, contact the AMC RSSO for assistance.

EXAMPLE 5 – A FORSCOM installation has built a new building and plans to transfer the storage, maintenance, and repair of AMC radioactive commodity items to the new facility. The old facility will be renovated and will become an exercise facility. What must the unit, local or IMA installation RSO do:

(1) Conduct a HSA by reviewing radiation safety office records, and talking with personnel who work or have worked in the building. Document the files reviewed as well as

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personnel consulted on Form 1. During this effort, the RSO learns that the building is comprised of 10 rooms that have been used over the past 30 years to store NRC-licensed and radium containing commodity items. And the RSO also learns that in one of the rooms, tritium fire control device repair and maintenance was conducted for a period of about 5 years during the 80's. The RSO also learns that the rooms housed older Ra-226 compasses, as well as old Ra-226 dials and gauges removed by maintenance personnel from old jeeps and tanks. In addition to tritium fire control devices and the Ra-226 compasses, dials, and gauges, the rooms were used over the years for CAMs, CADs, exit signs, and faulty smoke detectors.

(2) In accordance with AR 11-9 (para 1-4(3)) he notifies the AMC RSSO that his unit is planning to permanently vacate the area of radioactive commodities. The AMC RSSO asks him what commodities were or are present, and informs those AMC MSC's that hold the NRC licenses for the commodities.

(3) For the sealed sources (CADs and CAM/ICAMs), the RSO reviewed his records and contacted the licensee as indicated on Table 1, and determined that there had never been a report of CAM or CAD leakage. So per this guidance, no survey is required on account of the presence of CAM/ICAMs or CADs. And since the smoke detectors and exit signs are generally licensed items, surveys are not required on account of their presence. But the presence of Radium containing compasses, dials, and gauges does require a survey of the area. The historical review reveals that all ten rooms had been used to store the radium items, without any history of breakage. In the absence of any history of contamination or leakage, the 10 rooms where the radium was present as well as the furniture and equipment within are classified Class 3. Since all these rooms have a similar history of radioactive commodity use, they can be combined to form a single survey unit (as long as they don't total more than 2000 square meters, or about 21,000 square feet). Since the total square footage of the 10 room is only 3300 square feet, 30 random locations can be used to cover the floor and walls of all 10 rooms, and another 30 locations can be used to cover all the furniture and equipment in the 10 rooms. The total square footage of the floor and walls of 10 rooms is about 3300 square feet, so the RSO ensures about 1 random location per about 110 square feet (3300/30). The RSO acquires wipe test material from the license manager, and takes the 30 dry wipes on the floors and walls of the 10 rooms, and 30 dry wipes on the furniture and equipment in the 10 rooms, recording the locations on Form 2. The wipes are then submitted to the license manager for counting.

(4) The RSO also uses a thin window pancake probe to take surface readings at each location on the floor, walls, equipment and furniture, as well as background readings at 20 locations of similar construction but without a history of radioactive commodities or other radioactive materials. These results are also submitted to the licensee for evaluation. If any surface measurements exceed twice the background count rate, the licensee is contacted immediately for further guidance.

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(5) As for the room reportedly used for H-3 fire control repair and maintenance, the RSO contacts TACOM-Rock Island. They check their records and find that back in the 80's when the tritium operations were moved out of the room, a release survey was not conducted. So a survey of that room is now required. If the HSA indicates there had been a known release of tritium in the area as a result of commodity breakage, the guidance would require the area be classified as a Class 1 or 2 area. The requirements for a Class 1 or 2 area survey are beyond the scope of this guidance, and would need to be performed by personnel who have extensive experience in the decommissioning process and the MARSSIM and NUREG-1761 methodology. In this case, the RSO would contact the licensee at TACOM-Rock Island, and request assistance surveying the area as a Class 1 or Class 2 area. But in this example, the HSA indicates no history of tritium commodity breakage, so the area and furniture and equipment within can be classified as Class 3. The RSO therefore wet-wipes 30 random locations on the floor and walls of the room for tritium contamination, and wet-wipes 30 locations on furniture and equipment in the area mostly likely to be contaminated, and sends the 60 wipes to the lab identified by the licensee. Since tritium can not effectively be monitored with surface reading measurements, no surface meter readings are required.

(6) When the results of the dry wipes for the 10 room survey unit are returned, they are all reported as below the instrument detection level of 5 dpm/100cm² for Ra-226. This is well below the 20 dpm/100cm² limit for removable Ra-226 in Table 5-2 of AR 11-9. Form 1 (historical assessment) and Form 2 (survey record) are attached to the wipe test results (App B), are they are all filed at the FORSCOM Installation Radiation Safety Office, and they are also provided to the AMC RSSO and to CECOM for filing.

(7) When the results of the wet-wipes from the tritium room come back, they show tritium contamination at about 5,000 dpm/100cm² on the floor, and 7,000 dpm/100cm² on a table top, which although below the AR 11-9 limit of 10,000 dpm/100cm², is indicative of contamination requiring further investigation. The RPO therefore contacts the licensee for further instruction.

(8) TACOM-Rock Island reviews the wet-wipe results for the tritium room, and decides the tritium room can be released. CECOM reviews the results of the dry wipes and surface level measurements made in the 10 rooms, and concludes the area can be released. The RSO therefore releases the 10 rooms.

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TABLE 1

Item/Isotope	Licensee/Manager	Classification	Action Required
Fire Control Devices(H ³) (MRS, M67, M64, M16A1, M139, M140, M1A1 collimator, M13A1, M187, M90A2, M134A1, M14A1, M17, M171, M18, M1A1 quadrant, M64A1, M137, M137A1, M114A1, M58, M59, M224, M138)	TACOM Rock Island	Class 3	30 wipes/survey unit
		If history of breakage	Consult licensee
DU Munitions	JFSA, Rock Island	Class 3	30 wipes/survey unit
CAM/ICAM (Ni ⁶³)	TACOM Rock Island	None	No action required
		If history of leakage	Consult licensee
M8A1/M43A1 CAD (Am ²⁴¹)	TACOM Rock Island	None	No action required
		If history of leakage	Consult licensee
M88/M22 Chemical Detector(Ni ⁶³)	TACOM Rock Island	None	No action required
		If history of leakage	Consult licensee
MX7338 Source(Kr ⁸⁵)	CECOM	None	No action required
Radium Dial/Gauges	CECOM/TACOM Warren	Class 3	30 wipes/survey unit
		If history of leakage	Consult licensee
Radium Compass	CECOM/TACOM Warren	Class 3	30 wipes/survey unit
		If history of leakage	Consult licensee
UDM2 (Sr ⁹⁰)	CECOM	None	No action required
		If history of leakage	Consult licensee
UDM6 (Pu ²³⁹)	CECOM	None	No action required
		If history of leakage	Consult licensee
Compass(H ³)	CECOM	None	No action required
		If history of leakage	Consult licensee

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Explosives Detector	TACOM - Rock Island	None	No action required
Radium Check Source	CECOM	Class 3	30 wipes/survey unit
		If history of leakage	Consult licensee
ANPDR-77 (Th ²³²)	CECOM	None	No action required
Night Vision (Th ²³²)	CECOM	None	No action required
M1 Combustion Liner (Mg/Th)	AMCOM/TACOM-Warren	None	No action required
		If maintained or repair	Consult licensee
M1 DU Armor	TACOM Warren	None	No action required
Exit signs(H)	general license	None	No action required
		If broken	Consult AMC RSSO
Gun/Pistol Sights	TACOM - Rock Island	None	No action required
MCl (Am-241, Cs-137)	TACOM - Warren	None	No action required
		If history of leakage	Consult licensee
Smoke detectors (Am/Ra)	general license	None	No action required

LICENSEES:

TACOM Rock Island - DSN 793-6228/2965/2995, commercial (309) 782-6228/2965/2995, Thomas Gizicki.

CECOM - DSN 992-9723 or commercial (732) 532 9723, Craig Goldberg, Barry Silber, or Hugo Bianchi

TACOM-Warren - DSN 786-7635, commercial (586) 574-7635, Karen McGuire

AMCOM - DSN 897-2114, commercial (256) 313-2114, Keith Rose

JFSA - DSN 793-0338/2969, commercial (309) 782-0338/2969, Kelly Crooks, Gary Buckrop

AMC RSSO commercial 703-617-0242, Maj. Jason Dunavant

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Form 1

11-9p

Date:

Memorandum For Commodity Licensee, Unit RSO, Installation RSO, AMC RSSO

Subject: Historical Site Assessment

A. General Information

1. Location of survey: Fort, state, bldg #, room #s, etc.
2. Radiation Safety Officer & Phone # _____
3. Dates of Survey: DD Month YY

B. Historical Site Assessment

1. A review of local records and interviews with the following individuals have been used to document the historical use of radioactive material by the (unit name), in (location):

Name	Organization	Position	Phone #

Comments:

2. The chart below shows a summary of the commodities used.

Commodity	Isotopes	Activity	Dates Used

3. Leak test surveys, (dates, survey results): (attach copies)

SUBJECT: Radiological Surveys for Areas Where NRC-Licensed Commodities Or Radium
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- 4. Reports of accidents/incidents: (attach copies)
 - 5. Documents reviewed:
- C. Attachments:

Signature

SUBJECT: Radiological Surveys for Areas Where NRC-Licensed Commodities Or Radium Containing Commodities Were Present February 2004

Form 2

11-9p

Date:

Memorandum For Commodity Licensee, Unit RSO, Installation RSO, AMC RSSO

Subject: Release/Final Survey Record

1. Wipe samples were taken as indicated on the following sketch(s). A total of ____ dry wipes and ____ wet wipes were taken. The dry wipes were sent to the (Rock Island, Redstone, SBCCOM, or CECOM) radio-analytical laboratory for analysis. The wet-wipes were sent to the (Rock Island, Redstone, SBCCOM, or CECOM) radio-analytical laboratory for analysis.

2. The dry wipes were taken by _____, on (date) _____. They were submitted on (date) _____ for counting. The wet-wipes were taken by _____, on _____. They were submitted on _____.

3. Stationary surface measurements were take by _____, on (date) _____, using the following instrument:

Meter model: _____ Meter serial number: _____
Probe model: _____ Probe serial number: _____
Last calibrated: _____ Calibrated by: _____
Background _____ location

Background readings (20 separate locations in an area of similar construction with no history of rad commodities or materials):

4. Sketch attached indicating indicate room, building numbers, item of furniture/equipment as well as reference number for each wipe test location.

5. Wipe test and stationary measurements are attached.

Signed: