DEPARTMENT OF THE AIR FORCE

AIR FORCE RESERVE COMMAND

3 Jul 01

MEMORANDUM FOR ALL RESERVE MEDICAL UNITS

FROM: HQ AFRC/SGP
155 Richard Ray Blvd
Robins AFB GA 31098-1635

SUBJECT: Guidance For Occupational Health Working Groups

1. The information contained in this letter is intended to provide basic guidance for those AFRC Aerospace Medicine Councils (AMCs) or Occupational Health Working Groups (OHWGs) that determine medical surveillance requirements for occupational exposures to AFRC personnel. For Reserve units at collocated facilities, the active duty AMC or OHWG will assign exams. The information included here is excerpted from the DoDD 6055.5-M, *Occupational Health Surveillance Manual*, May 1998. This manual is available on the Web at: https://128.174.5.51/denix/Public/ES-Programs/Safety/Documents/6055.5/manual.html Additional information has been gathered from AFOSH Standard 48-8, *Controlling Exposures to Hazardous Materials*, 1 September 1997. Additional guidance concerning occupational medical exam requirements is available from the Air Force Institute for Environmental, Safety, and Occupational Health Risk Analysis (AFIERA) website at: http://sg-www.satx.disa.mil/iera/rsh/OccMed/Medical_Surveillance/medical_surveillance.html

2. The heart of the occupational medicine program is the AF Form 2755, Workplace Exposure Summary. This document should be used to determine which exposures are significant enough to warrant an initial, periodic, or termination occupational exam. The AF Form 2755 is filled out by Bioenvironmental Engineering and lists all potential exposures and which exposures are above an action level (the action level is normally 50% of the Occupational Exposure Limit). AFOSH Std 48-8 then directs that employees who are exposed to hazardous materials at levels **greater than the action level for more than 25 days per year**, who wear respiratory protection, or who have a significant potential for exposure through skin absorption will be provided initial, periodic, and termination medical surveillance, as appropriate or required by 29 CFR 1910 or 29 CFR 1926. In addition, if there is a lack of statistical confidence in the sampling data or other concerns for the occupational health of a group of workers, the AMC or OHWG will decide if medical surveillance is warranted. Bottom Line: If exposures have been assessed and are below the action level, medical exams are not warranted.

3. There have been several changes in the past few years that have eliminated the requirement for certain exams. These include:

a. Respiratory Protection Program: There is no longer a requirement to perform PA Chest X-Rays for personnel on the Respiratory Protection Program (RPP). In addition, AFOSH Std 48-

137 no longer requires a Pulmonary Function Test be performed on personnel enrolled in the RPP. Paragraph 5.3.2.is quoted below:

> "Pulmonary function studies are often included in respirator certification examinations, however, they are not reliable in predicting who can and cannot wear a respirator. They should not be routinely performed. Thus it is recommended that spirometry, chest x-rays and other tests be done only when clinically indicated."

For personnel being placed on the RPP, an initial medical questionnaire must be completed by the candidate and reviewed by a physician to determine if the person can wear a respirator. At minimum, the mandatory questions stated in the 29 CFR 1910.134, Appendix C, will be used. In addition to the mandatory questions, OSHA's optional questions and other questions developed locally may be used. Once the initial questionnaire is filled out, there is no need to have the individual fill out the questionnaire thereafter, as long as Bioenvironmental Engineering confirms the worker has had no problems wearing the respirator during annual fit-testing and training (AFOSH Std 48-137, para 5.5).

b. Exposures to Ionizing Radiation: There are currently no occupational exam requirements for personnel occupationally exposed to ionizing radiation. The requirement for a Complete Blood Count was rescinded several years ago and is not a good indicator of occupational exposures to ionizing radiation. In addition, AFI 48-125, *The US Air Force Personnel Dosimetry Program*, para. 3.2.11, lists the following occupations as normally not requiring issue of Thermoluminescent Dosimeters (TLDs): Dental X-Ray, Baggage X-Ray, Explosive Ordnance Disposal (EOD), and Office of Special Investigations (OSI).

c. Exposures to JP-8: The primary hazards associated with JP-8 are contact dermatitis and exposure to benzene, which is a constituent of JP-8. The Air Force has established and Occupational Exposure Limit (OEL) of 350 milligrams per cubic meter (mg/m^3) and a 15-minute Short Term Exposure Limit of 1800 mg/m^3. Short-term exposure to elevated levels of JP-8 may cause nausea, eye irritation, and dizziness, however no occupational exams are warranted for exposure to JP-8 itself. Our recommendation is to determine the benzene exposure and determine if any exams are required based on that exposure.

d. Visual Acuity: Periodic visual acuity tests are not recommended as part of a routine occupational exam, except for workers using Class 3b or 4 lasers. However, they may be performed if the patient indicates they've experienced eye problems on their health history.

4. Specific guidance on other physical and chemical agents that could potentially cause occupational exposures to AFRC personnel is contained in Atchs 1-17. For each chemical agent listed, the AF Action Level is listed to compare against the exposure documented by Bioenvironmental Engineering. Again, AFOSH Std 48-8 states that specific occupational exams are warranted when exposures are above an action level or there is a lack of confidence in the characterization of the exposure. When exams are assigned due to lack of confidence, the AMC or OHWG should request that Bioenvironmental Engineering place a high priority on characterizing the exposure to more precisely determine the need for an exam.

5. Occupational Exams represent a major tasking which our Reserve Medical Units must perform. The elimination of needless or unwarranted exams will allow more time for our medical staffs to spend on their primary mission – **training**. This document will be made available on our website at: https://wwwmil.afrc.af.mil/HQ/SG/sgp/sgpb.htm. Any questions concerning this letter may be addressed to Lt Col (Dr.) Brent Klein at DSN 497-0605 or Lt Col Richard McCoy at DSN 497-0600.

// Signed //
PATRICIA A. NELL, Col, USAF, MC, CFS
Chief, Aerospace Medicine Division

17 Atchs:
1. Asbestos
2. Benzene
3. Cadmium
4. Chromates
5. Hydrazine
6. Isocyanates
7. Lasers
8. Lead
9. Methylene Chloride
10. Methyl Isobutyl Ketone
11. Noise
12. Pesticides
13. Radiofrequency Radiation
14. Toluene
15. 1,1,1-Trichloroethane (Methyl Chloroform)
16. Xylenes
17. Fire Fighters NFPA Fit-For-Duty Exam Requirements

Asbestos

OSHA PEL: 0.2 fibers/cc ACGIH TLV: 0.1 fibers/cc
AF OEL: 0.1 fibers/cc AF Action Level: 0.1 fibers/cc (Note: The Action Level is the same as the OEL due to the unreliability of analysis methods to accurately measure airborne exposure concentrations below 0.1 fibers/cc.)

OSHA has two standards that apply to asbestos work. One is the Construction Standard that applies to personnel performing construction, renovation, abatement or demolition of asbestos containing material (ACM) or around ACM. Generally in AFRC, abatement of ACM and construction involving disturbance of ACM is performed by contract. The other OSHA standard is the General Industry Standard for asbestos. This standard would apply to maintenance activities involving materials containing asbestos. Examples of operations that fall under the General Industry Standard may include Vehicle Maintenance brake work, Aircraft Barrier Maintenance, and work involving asbestos gaskets. Brakes in general purpose vehicles have been replaced with non-asbestos brake material. In addition, exposure to asbestos from brake operations can be minimized by the use of wet methods.

Occupational Exam Requirements: If personnel 8-hour TWA exposures are greater than 0.1 fibers/cc for 25 days or more per year, OSHA and AFOSH Std 48-8 require the following exams:

The Physical Examinations and Standards Section (PES) will use DD Form 2493-1, Asbestos Exposure, Part I – Initial Medical Questionnaire and DD Form 2493-2, Asbestos Exposure, Part II – Periodic Medical Questionnaire, as appropriate, when accomplishing asbestos medical examinations. **Not**e: Medical surveillance of personnel conducting class I, II, or III work more than 30 days per year, regardless of whether their exposure exceeds the OEL, is required.

“Class I asbestos work” means activities involving the removal of Thermal System Insulation (TSI) and surfacing ACM and Presumed ACM (PACM).

“Class II asbestos work” means activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.

“Class III asbestos work” means repair and maintenance operations, where “ACM”, including TSI and surfacing ACM and PACM, is likely to be disturbed.

Employees Enrolled Under The Construction Standard:

Preplacement, Periodic and Termination of Exposure Exams: Employees enrolled under this standard will receive at a minimum a preplacement physical exam with emphasis on the respiratory, cardiovascular and digestive systems, in addition to medical review of the questionnaire referenced above. Employees will also receive a pulmonary function test which determines the FEV1 and Forced Vital Capacity. The performance of a Chest X-ray is discretionary (the only discretionary item in this section) and left to the opinion of the examining physician.

Employees Enrolled Under The General Industry Standard:
Preplacement, Periodic and Termination Exams: Employees covered under this standard will receive the same exams mentioned in the construction standard. The only difference between the two surveillance programs is that Chest X-rays are mandatory, and will be administered according to the following schedule:

Years Since First Exposure	**Age of Employee**		
	15-35	35-45	45+
0-10	Every 5 years	Every 5 years	Every 5 years
10+	Every 5 years	Every 2 years	Every 1 year

Physician's written opinion required by 29 CFR 1910.1001, paragraph (l)(7), or 29 CFR 1926.1101, paragraph (m)(4), will be documented on AF Form 422, *Physical Profile Serial Report*, and provided by the PES to all affected employees.
Chest X-rays may be interpreted by a certified B-reader, a board eligible/certified radiologist, or an experienced physician with known expertise in pneumoconiosis. All interpreters must have a complete set of ILO-U/C International Classification of Radiographs For Pneumoconiosis 1980 immediately available for reference.
Medical facilities should consult with their MAJCOM (or equivalent) Chief of Aerospace Medicine to establish local policy regarding whether ILO films should be purchased (and asbestos films read locally), or whether the asbestos films should be shipped to their supporting medical center for interpretation.

Atch 1

Benzene

OSHA PEL: 1.0 ppm; ACGIH TLV: 0.5 ppm
Air Force OEL: 0.5 ppm Air Force Action Level: 0.25 ppm

Medical surveillance is required for all employees exposed to benzene at or above the action level 25 days or more per year, all employees exposed to benzene at or above the PEL for 10 or more days per year; and for workers exposed to more than 10 ppm for 30 or more days a year prior to 1987 while in Federal service.

Initial Examination:

1. Detailed history – past work exposure to benzene or any other hematological toxins; family history of blood dyscrasias including hematological neoplasm's; history of blood dyscrasias including genetic hemoglobin abnormalities, bleeding abnormalities, abnormal function of formed blood elements; history of renal or liver dysfunction; history of meds routinely taken; history of previous exposure to ionizing radiation; and exposure to marrow toxins outside current work situation.
2. Complete physical exam
3. CBC – including WBC with differential, platelets, hematocrit, hemoglobin, erythrocyte count and erythrocyte indices (MCV,MCH, MCHC)
4. If wear respirators for at least 30 days, required to have PFT and pay special attention to cardiopulmonary system on physical exam

Periodic Examinations:

1. Brief history regarding any new exposure to potential marrow toxins, changes in meds, and appearance of physical signs relating to blood disorders
2. CBC as described above
3. If respirator required PFTs every 3 years along with specific evaluation of cardiopulmonary system.

Emergency Examinations:

1. Urine sample at end of shift, tested for urinary phenol within 72 hrs. Urine specific gravity corrected to 1.024
2. If urinary phenol < 75 mg phenol/L of urine no further testing
3. If > 75 mg phenol/L of urine then CBC including erythrocyte count, leukocyte count with diff and platelet count monthly times 3 months.

If CBC for initial and periodic indicate any of following must repeat within 2 weeks:

1. Hgb falls below normal and/or indices show persistent downward trend form individual's pre-exposure norms; provided these findings cannot be explained by other medical reasons.
2. Platelet count varies more than 20% below most recent values or falls outside normal limit
3. WBC is below 4,000 per mm^3 or there is an abnormal diff count.
4. If abnormality persists patient referred to hematologist or internist for further eval unless the physician has good reason to believe such referral is unnecessary.

5. If patient referred then shall be removed from areas of exposure that may exceed the AL until opinion rendered

Notification of Medical Surveillance – For each examination, the employer shall obtain and provide the employee with a copy of the physician's written opinion within 15 days of the examination. Written opinion shall include the occupationally pertinent results of the medical examination and tests, if employee's health is at increase risk of material impairment from benzene, recommended limitations or use of protective equipment, and a statement that the employee has been informed of the results of the medical examination.

Training – the employer shall provide employees with information and training at the time of their initial assignment to a work area where benzene is present. If exposures are above the AL, employees shall be provided with information and training at least annually thereafter. (This is HAZCOM plus explaining contents of OSHA standard (including appendix A & B) and explaining the medical surveillance program.)

Atch 2

Cadmium

OSHA PEL: 5 μg/m^3 OSHA Action Level: 2.5 μg/m^3 ACGIH TLV: 10 μg/m^3
Air Force OEL: 5 μg/m^3 Air Force Action Level: 2.5 μg/m^3

Required Medical Surveillance: Personnel are recommended for placement into medical surveillance when they are exposed over the action level for more than 25 days per year, or 10 days in a quarter. Pre-placement, Periodic and Termination.

Medical History
Occupational History
Physical Examination:
Nasal cavity (mucosal irritation and/or ulceration)
Lungs (fibrosis of lungs)
Laboratory
CBC, Urinalysis, spirometry and Chest X-Ray (PA view only)
For males over 40 years old, prostate palpation, or other at least as effective diagnostic test(s)

Medical monitoring is to include the periodic analysis of cadmium in blood (CDB), cadmium in urine (CDU) and beta-2-microglobulin in urine (B(2)MU). As CDU and B(2)MU are to be normalized to the concentration of creatinine in urine (CRTU), then CRTU must be analyzed in conjunction with CDU and B(2)MU analyses.

Actions triggered by initial biological monitoring:

If the results of a medical examination indicate any laboratory or clinical finding consistent with cadmium toxicity, the employer, within 30 days, shall reassess the employee's occupational exposure to cadmium and take the following corrective action until the physician determines they are no longer necessary:

Periodically reassess: the employee's work practices and personal hygiene; the employee's respirator use, if any; the employee's smoking history and status; the respiratory protection program; the hygiene facilities; and the maintenance and effectiveness of the relevant engineering controls;

Within 30 days after the reassessment, take all reasonable steps to correct the deficiencies found in the reassessment that may be responsible for the employee's excess exposure to cadmium;

Provide semiannual medical reexaminations to evaluate the abnormal clinical sign(s) of cadmium toxicity until the results are normal or the employee is medically removed; and

Where the results of tests for total proteins in urine are abnormal, provide a more detailed medical evaluation of the toxic effects of cadmium on the employee's renal system.

Chromates

Chromates are found in primers used in aircraft and vehicle corrosion control. The most common forms of chromates in aircraft primers are barium chromate, zinc chromate, and strontium chromate. For aircraft priming operations, the AF is converting to almost exclusive use of strontium chromate. However, during sanding of existing paint and primer, all three chromates may be present. Vehicle primers may contain lead chromate in addition to the other three forms of chromate.

	OSHA PEL (as Cr, mg/m^3)	OSHA AL (as Cr, mg/m^3)	ACGIH TLV (as Cr, mg/m^3)	AF OEL (as Cr, mg/m^3)	AF AL (as Cr, mg/m^3)
Barium Chromate	0.05	0.025	0.01	0.01	0.005
Lead Chromate	0.05	0.025	0.012	0.012	0.006
Strontium Chromate	0.05	0.025	0.0005	0.0005	0.00025
Zinc Chromate	0.05	0.025	0.01	0.01	0.005

Medical Surveillance: Personnel exposed to levels of chromates above the action level for more than 25 days per year shall receive an initial, periodic, and termination occupational exam.

Physical Exam:
Nasal cavity (mucosal irritation and/or ulceration)
Skin (rash, erosion, ulcer, eczema)

Additional Medical History:
Nose (bleeding or mucosal irritation)
Perforation of nasal septum
Lung or respiratory disease (COPD, bronchitis)
Smoking history (duration, amount and currently smoking)
Shortness of breath
Cough (dry or productive)
Cancer
Skin diseases

Hydrazine

OSHA PEL: 1.0 ppm ACGIH TLV: 0.01 ppm
AF OEL: 0.01 ppm AF Action Level: 0.005 ppm

Workers exposed to levels above the action level for 25 days or more per year will be included in the medical surveillance program. Workers who may infrequently enter an area where the hydrazine exposure is at or above the action level, such as fire fighters, will not normally be included in the medical surveillance program for hydrazine.

If an unusual or emergency situation subjects a worker to probable exposure to hydrazine, the individual should be given a special purpose examination. The AMC will evaluate the potential for exposures for situations other than in controlled areas and emergency situations to determine the appropriate medical surveillance.

Types of Medical Evaluations :
Preplacement Evaluations: Preplacement evaluations will be completed before the worker enters a controlled area. The scope and content of this evaluation will be be determined by the Occupational Health Working Group (OHWG) and evaluating physician at the time this evaluation is needed. A competent health care provider will evaluate each worker; if the health provider is a non-physician, a physician will review the findings.
Periodic Evaluations : Periodic evaluations will be performed at least annually for employees enrolled in a medical surveillance program for hydrazine. Similar to the pre-placement evaluation, the scope and content of the periodic evaluation will be determined by the Occupational Health Working Group and the evaluating physician at the time this evaluation is needed.
Termination of Exposure Evaluations : The medical record of an employee removed from exposure to hydrazine will be reviewed by a physician. The scope and content of any additional evaluation will be made by the physician reviewing the medical record.

An abnormal finding indicates further evaluation and is not in itself disqualifying. Verification of abnormal laboratory results should disqualify a worker from duties that risk exposure to hydrazine until a physician can determine the significance of the finding.

Isocyanates

For Hexamethylene diisocyanate (HMDI), Methylene bisphenyl isocyanate (MDI) and Toluene-2,4-diisocyanate (TDI):

OSHA PEL: 0.005 ppm ACGIH TLV: 0.005 ppm
AF OEL: 0.005 ppm AF Action Level: 0.0025 ppm

Recommended Medical Surveillance:
Personnel exposed to isocyanate levels above the action level for 25 days or more should receive a preplacement exam to rule out a history of prior sensitization, and an annual and termination medical exam.
Physical Exam:
Mucous membranes
Respiratory (wheezes, rales)
Skin
Preplacement and periodic spirometry (FEV_1 and FVC)
Preplacement CXR at the discretion of the provider

Lasers

The only lasers that require medical surveillance are **Class 3b and 4 lasers** and laser systems.

Although ANSI 136.1-2000 leaves decision of termination exams to the employer, the Air Force via AFOSHSTD 48-139 (10 Dec 99) requires termination exams.

Frequency of Medical Examinations. Pre- and post-employment medical examinations will be performed only before an individual's initial assignment to laser duties and as soon as practical subsequent to actual termination of duties involving lasers (i.e., Permanent Change of Station or Permanent Change of Assignment, retirement, or separation). Periodic examinations are not required. Following any suspected laser injury, the pertinent examinations, as determined by an appropriately qualified physician (i.e., ophthalmologist) will be performed.
Medical Examination Requirements. Minimum exam requirements are provided in the following paragraphs. Complete details on the listed exams are provided in ANSI Z136.1. Appendix E. The Air Force post-employment exam will follow the same requirements as the pre-employment exam.

- Ocular History: Review past ocular history and family history for any conditions related to the eyes.
- Visual Acuity: Best corrected, distant and near vision should be measured.
- Macular Function: Test macular function with an Amsler grid using appropriate optical correction to determine if distortion or scotomas exist.
- Color Vision: Use a pseudo-isochromatic plate test (red/green and/or blue/yellow) or similar color vision test to document color vision discrimination.
- If any nonocular abnormalities are found, a more extensive examination will be con-ducted to determine underlying pathology.

Suspected Overexposure Investigations: If there is a suspected laser exposure, then Attachment 2 of AFOSHSTD 48-139 outlines the exams and steps that must be taken. Summary of Attachment 2 is below:

- Individual should immediately report to the Medical Treatment Facility whenever eye exposure to laser light is suspected.
- An examination should be done and will include at minimum the following:
    - Medical history
    - External examination including skin
    - Best corrected visual acuity (near and far)
    - Amsler grid
    - Stereopsis
    - Color vision
    - Nondilated funduscopy (dilated examination is recommended)
- If the results of the examination are normal and the individual does not have any persistent visual complaints, the individual can be returned to duty. Normal is defined as normal for the individual.
- If the results of the initial examination performed are abnormal or questionable, additional examination will be conducted to include:
    - Pupil examination

    - Slit lamp bimicroscopy
    - Dilated funduscopy
    - Retinal photography
- If the results of the additional examination do not provide any questionable abnormalities, contact the Tri-Service hotline at (800) 473-3549.
- If the results of the additional examination are abnormal or questionable, individual will be referred for a full and thorough ocular examination which may include retinal photographs, visual fields, color vision testing, fluorescent angiography, and other tests as appropriate. Contact the USAF School of Aerospace Medicine for further action. [DSN 240-3241]

Atch 7

Lead

OSHA PEL: 50 μg/m^3 OSHA Action Level: 30 μg/m^3 ACGIH TLV: 40 μg/m^3
Air Force OEL: 50 μg/m^3 Air Force Action Level 30 μg/m^3

Medical Surveillance is required for all workers, except in construction, who are or may be exposed over the action level for 25 days or more per year. Pre-assignment, Annual and Termination. Biological monitoring in the form of Blood Lead Level and Zinc Protoporphyrin testing is required every 6 months. Periodic medical evaluations are performed based on results of biological monitoring. Medical surveillance examinations are required at least annually if an employee's blood lead has been greater than 40 μg/100 g in the preceding 12 months, and biological monitoring is increased to every 2 months.

(**Construction Work:** Construction, alteration, repair, or renovation activities that disturb in-place lead-containing materials. For the purposes of lead exposure, this definition does not include routine cleaning and repainting (such as minor surface preparation and repainting of housing units between occupants or at scheduled intervals) where there is insignificant damage, wear, or corrosion of existing lead-containing paint, coatings or substrates.

Medical Examination:
Detailed work history and medical history
Physical examination with particular attention to teeth, gums, hematologic, gastrointenstinal, renal cardiovascular, and neurologic systems.
Complete Blood Count (Hgb, Hct, red cell indices, peripheral smear for morphology exam)
BUN and creatinine
Blood Lead and ZPP
Urinalysis with microscopic
Fertility status: sperm count or pregnancy testing if requested by the worker or deemed appropriate by the physician.

The following information will be made available to the employee at the conclusion of each examination required:
Written copies of biological monitoring results within five days of receipt of results. Written medical opinions must be prepared after each examination pursuant to the standard. If the examining physician includes a medical finding, determination or opinion that the employee has a medical condition which places the employee at increased risk of material health impairment from exposure to lead, then the employee must be removed from exposure to lead at or above the action level. Alternatively, if the examining physician recommends special protective measures for an employee (e.g., use of a powered air purifying respirator) or recommends limitations on an employee's exposure to lead, then the employer must implement these recommendations. Recommendations may be more stringent than the specific provisions of the standard. The examining physician, therefore, is given broad flexibility to tailor special protective procedures to the needs of individual employees. This flexibility extends to the evaluation and management of pregnant workers and male and female workers who are planning to raise children. Based on the history, physical examination, and laboratory studies, the physician might recommend special protective measures or medical removal for an employee who is pregnant or who is planning to

conceive a child when, in the physician's judgment, continued exposure to lead at the current job would pose a significant risk. The return of the employee to his or her former job status, or the removal of special protections or limitations, depends upon the examining physician determining that the employee is no longer at increased risk of material impairment or that special measures are no longer needed.

Atch 8

Methylene Chloride

OSHA PEL: 25 ppm ACGIH TLV: 50 ppm
AF OEL: 25 ppm AF Action Level: 12.5 ppm

Medical Surveillance: Personnel exposed to levels of methylene chloride above the action level for more than 25 days per year or more than 10 days in a quarter shall receive an occupational exam.

Physical Exam:
Conjunctival injection
Erythema of mucous membranes or skin
Dryness or irritation of exposed areas of skin
Neuromuscular incoordination and/or ataxia
Periodic post-shift carboxyhemoglobin blood test – recommended, but not required

Methyl Isobutyl Ketone (MIBK)

OSHA PEL: 100 ppm ACGIH TLV: 50 ppm
AF OEL: 50 ppm AF Action Level: 25 ppm

Entry into Medical Surveillance: Personnel shall be entered into medical surveillance when they are exposed over the action level for more than 25 days per year or 10 days in a quarter.

Personnel should receive a pre-placement, annual and termination exam.
Physical Exam:
Medical History
Occupational History
Skin at points of contact (dermatitis, redness, desquamation)
Liver (enlarged)
Nervous System (atoxia, weakness)
Liver function test (if liver enlargement is present)

Noise

AFOSH Std 161-20, para 1.2.h defines hazardous noise as an 8-hour equivalent continuous sound level of 85 decibels A-weighted (dBA) or greater. In para 2-11, the DBMS must ensure that all AF personnel exposed to hazardous noise receive initial education on harmful effects of noise, are properly monitored, and that recommendations for protection will reduce, at the ear, the exposure to less than 85 dBA as an 8-hour time weighted average.

In August 1997, AFMOA/CC clarified the policy for recommending audiometric monitoring Periodic audiometric monitoring **for traditional Reserve personnel** should only be recommended when both the following conditions are met:

a. Audiometric monitoring is indicated by survey results or medical and engineering judgment according to paragraph 1.6.2.1.10 of AFOSH Std 48-19, Hazardous Noise Program.

b. Workers are routinely (greater than 25 days per year) exposed to hazardous noise.

AFOSH Std 161-20 is currently under revision and will become AFOSH Std 48-20.

HEARING CONSERVATION PROGRAM FUNCTIONAL AREA RESPONSIBILITIES

The Hearing Conservation Program (HCP) is a Wing program and requires full cooperation from several functional areas within the wing. This includes Reserve Medical Unit (RMU), full-time Bioenvironmental Health (BE) and Public Health (PH) offices, commanders and supervisors. Listed below are responsibilities for each of these functional areas. These apply to AFRC units with full-time BE/PH personnel. For collocated units, the active duty host will be responsible for program oversight.

Reserve Medical Unit

Aerospace Medicine Council Chairman

- Responsible for oversight of all medical aspects of AFRC HCP.
- Assign duties of HCP to members of Team Aerospace.
- Reserve bases (non-collocated) with full-time BE/PH will be designated as program manager.
- Assign credentialed health care providers as HCP examining practitioners (Audiologists, physicians, nurse practitioners, and physician's assistants can be examining practitioners).
- Ensure all personnel (civilian and military) performing audiograms are certified as hearing conservationists according to the requirements established by CAOHC. External parties conducting audiometric monitoring on Air Force personnel, under referrals to the civilian community, must be CAOHC certified.
- Ensure all audiometric testing done in the HCP is conducted with audiometers meeting standards of the American National Standard Specification for Audiometers, ANSI S3.6-1989 (or current ANSI standard).

- Ensure procedures are established to schedule and monitor all personnel on HCP (required follow-ups included).
- Ensure workers who are engaged in hazardous noise areas or processes are:
    - Able to perform their essential job tasks from a hearing standpoint.
    - Not a safety hazard to themselves or others.
    - Properly educated, protected and monitored to prevent and detect auditory damage from hazardous noise.
- Ensure all recommendations to restrict a worker's exposure to hazardous noise are appropriate.

Physical Exams Section

- Conduct all three types of hearing conservation examinations: reference, annual, and termination.
- Schedule hearing conservation examinations for all personnel in the HCP (civilians, ARTs, traditional reservists, and aircrew members) as part of the occupational health medical examination (OHME).
- Report no-shows to commanders/supervisor.
- Ensure all audiometers are properly calibrated (biological calibration) daily prior to using. Document calibration on functional checklist.
- Ensure all audiometers, headsets, and sound rooms have been tested and calibrated before using.
- Inform patients of their audiogram results.
- Ensure individuals with Standard Threshold Shift (STS) have all follow-up completed within 30 days and are referred to BE/PH or Hearing Conservation Diagnostic Center (HCDC)/Hearing Conservation Center (HCC), as necessary.
- After completion of hearing conservation exams ensure all patients requiring earplugs or initial education are referred to BE/PH.
- Provide PH with information on patients requiring referral to HCCs or HCDCs.
- Report OSHA reportable hearing loss cases to BE/PH.
    - **IAW AFI 48-20, Interim Guidance dated 07 Apr 00, OSHA Reportable Hearing Loss.** A shift in hearing thresholds for the worse relative to the original reference audiogram of an average of 25 decibel (dB) at 2000, 3000, and 4000 Hertz (Hz), either ear. That is, if the sum of the shifts at 2000, 3000, and 4000 Hz equals to or exceeds 75 dB in either ear, an OSHA Reportable Hearing Loss has occurred and must be reported on an OSHA Form 200 *Reportable Injury/Illness Log.*
- Ensure USAF HCDR receives appropriate Defense Occupational & Environmental Health Readiness System (DOEHRS) data input.

Full-time Bioenvironmental Engineering/Public Health Office

Bioenvironmental Engineering (Full-time BE/PH Personnel)

- Perform noise surveys and dosimeters to quantify noise hazards as described in AFOSH 48-19. The BE and Medical Maintenance or the Medical Equipment Repair Center (MERC) will ensure all calibrations and certifications are performed according to the American National Standard Specification for Sound Level Meters, ANSI S14-1983 and American

National Standard Criteria for Permissible Ambient Noise During Audiometric Testing, ANSI S3.1-1977 (Rl986).

- Advise AMC at least annually on exposure characterization for each group exposed to hazardous noise.
- Complete AF Form 2755, *Master Workplace Exposure Data Summary*, including the eight-hour time weighted average (TWA) expressed in (dB)(A) with a 3 dB exchange rate and the list of specific Hearing Protection Device (HPD) (plugs, muffs, or combinations) which will protect workers to an at-the-ear sound level of less than 85 dB. Work shifts greater than 8 hours must be evaluated per length of exposure. If administrative controls are needed (in addition to the use of personal protection devices) the length of time the workers may be exposed to the hazardous noise source will also be provided. Ensure AF Form 2755 is forwarded to PH.
- In a written report inform shop supervisors and commanders of the results in noise surveys. Reports may include information about both existing and required:
    - Engineering controls
    - Administrative controls
    - Hearing protection
- Assess the adequacy of hearing protectors per AFOSH Std. 48-19.
- Provide advice and consultation to Aerospace Medicine Council (AMC) on the HCP.

Public Health (BE/PH Personnel)

- Manage HCP in the absence of an audiologist.
- Identify personnel requiring medical monitoring in HCP.
- Ensure Director of Base Personnel Flights is kept informed of Civilian Classifications that require pre-employment audiometric evaluation.
- Ensure proper coding of individuals in the personnel system.
- Ensure all personnel requiring audiometric monitoring (civilians, ARTs, traditional reservists, and aircrew members) is tracked and a roster is updated at least semi-annually IAW DoDI 6055.12. This roster will be provided to the Physical Exam Section (PES).
- Track patients referred to HCCs or HCDC, ensure findings and recommendations are provided to the examining practitioner for review and action.
- Track number of hazardous noise exposed workers for annual audiometer completion rates (this is measure of HCP effectiveness IAW DoDI 6055.12).
- Perform trend analysis for HCP outcome measures and determine management actions.
- Provide job capability assessments to examining providers for fitness and risk evaluations.
- Establish a method to ensure initial education and training on hearing conservation for all personnel who are exposed to noise at or above an 8 hour TWA of 85 dBA, within 30 days of assignment to hazardous noise, in coordination with units/shops.
- Record on AF Form 2766, *Clinical Occupational Health Examination Requirements,* the TWA exposure in dBA and the specific earplugs, muffs, and administrative controls recommended by the BE on AF 2755.
- Ensure adequate and appropriate hearing protection is provided to all personnel exposed to hazardous noise. Ensure workers with an STS; have hearing protectors attenuate to worker's exposure for an 8-hour TWA of 85 dB or below.
- Provide annual education and training on hearing conservation for supervisors.

- Conduct periodic worksite visits (shop visits) in noise hazard areas to assess annual training is effective and hearing protection is appropriate and properly used.
- Notify personnel with a Permanent Threshold Shift (PTS) in writing, within 21 days of identifying an STS. Supervisors will be notified in writing by Public Health. The notification letter shall not contain additional medical details without prior written permission by the worker. The supervisor shall also be advised that any discussion of a worker's hearing abilities with non-authorized personnel is strictly prohibited. The AF Form 422 or equivalent may be used for this purpose.
- Provide advice and consultation to the AMC/OHWG on the HCP.
- Brief the Base Safety Council at least annually on the HCP.
- Provide commanders at least an annual update on the HCP and on how to prevent the adverse effects of hazardous noise.
- Report OSHA Reportable hearing loss cases to the Safety Office for inclusion on the OSHA Form 200, *Log and Summary of Occupational Injuries and Illnesses*.

Program Manager (BE/PH Personnel)

- Establish procedures to monitor, perform fitness and risk evaluations.
- Work with the personnel office to review claims submitted for hearing loss under the Department of Labor's OWCP.

Pesticides

Organophosphates and Carbamates: These pesticides are grouped together due to their common toxic action – inhibition of cholinesterase. Nearly all of these pesticides are readily absorbed through dermal contact, inhalation, and ingestion making it essential for medical personnel to evaluate the exposure conditions and work practices of the applicators to assess the inhalation hazard as well as the likelihood of dermal exposure and ingestion.

Organophosphates	OSHA PEL (mg/m^3)	ACGIH TLV (mg/m^3)	Air Force OEL (mg/m^3)	Air Force AL (mg/m^3)
Dichlorvos	1.0	0.9	0.9	0.45
Diazinon		0.1	0.1	0.1
Chlorpyrifos		0.2	0.2	0.1
EPN	0.5	0.1	0.1	0.05
Ethion		0.4	0.4	0.2
Fenthion		0.2	0.2	0.1
Malathion	15	10	10	5
Nalad		3	3	1.5
Carbamates				
Carbaryl (Sevin)	5	5	5	2.5
Thiram	5	1	1	0.5
Propoxur		0.5	0.5	0.25

Criteria for Entry into Medical Surveillance: Personnel should be entered into a medical surveillance program if they are exposed to airborne concentrations above the action level for 25 days or more per year.

The personnel should receive a preplacement, annual (post-shift, during pesticide application season) and termination exam.
Medical Exam:
Medical History
Occupational History
Physical Exam
If acute toxicity is suspected, the worker should have a complete neurologic exam (including evaluation of papillary size and reactivity and observation for muscle fasiculations and tremor), auscultation of the chest for wheezing, and inspection for cyanosis. Physical examinations for signs of mild exposures are not recommended.
Serum and RBC cholinesterase levels

Radiofrequency Radiation

In accordance with para. 3.6. of AFOSH Std 48-9, *Radiofrequency Radiation (RFR) Safety Program*, routine pre-placement, baseline, periodic, and termination occupational medical examinations **are not required**. There is no known scientific or epidemiological basis to support such requirements. Bioeffects research and epidemiological studies indicate that ocular effects, such as the formation of cataracts, are a threshold phenomenon occurring during localized exposures to levels more than 10 to 100 times the permissible exposure limits. These effects are not distinguishable from those caused by aging and other physiological events; and have not been demonstrated conclusively in humans exposed at levels below the current PEL. Although routine medical occupational examinations are not required by this standard, each shop with an exposure potential should be reviewed annually by the Aerospace Medicine Council. Documentation should be provided to the council to keep them appraised of current medical exam requirements, and changes to the requirements of the AFOSH Standard.

Medical Evaluations as Part of an Alleged RFR Overexposure Investigation: Individuals who are allegedly exposed to levels above the PEL will receive extensive medical testing/examination or eye examinations as indicated only under the following conditions:

Condition 1: The symptoms displayed at the time of the initial, cursory examination (within 72 hours following exposure) indicate the need for further testing and/or examination, as determined by the attending physician. All symptoms noted should be treated and followed-up within 72 hours following exposure.
Condition 2: The BE determines that the patient was overexposed to at least 5 times the PEL Eye examinations should be accomplished within 72 hours following the incident if the exposure involved the patient's eyes.
Condition 3: The patient was exposed to an undetermined amount of RF energy, but was definitely exposed above the existing time-weighted average PEL, and the exposure was localized to the head and may have involved the eyes.
Condition 4: The patient allegedly exposed insists that he/she experienced some physical phenomenon that was not detectable during initial, cursory examination and the BE finds that the individual was exposed to levels exceeding the PEL. ***NOTE:*** Any suspected exposure to RFR will be investigated by the BE. If the investigation finds that the individual's exposure was below the PEL, then the patient must be clearly advised and the findings of the investigation must be documented in his/her medical records and the industrial facility case file which is maintained by BE.

Examination Checklist. The following checklist should be used to ensure that nothing is overlooked during initial medical response to the concerns of a patient who is alleging personal overexposure to RF radiation:

I. HISTORY:
a. Present Illness. Include the following information:
1. Type of Equipment, Model Number, and Frequency.
2. Distance from the source to the person.
3. Exposure Duration.

4. If intermittent give longest individual time exposed and overall time period.
5. Were any noises heard in the ears?
6. Was a sensation of heat experienced - where?
7. What body part(s) believed to be involved.
8. Does a previous history of RFR overexposure exist?
9. Does a previous history of other overexposure (chemical or physical agents) exist?

b. Past Medical History
1. List all types of occupations not just Air Force.
2. Obtain standard past medical history.
c. Complete Review of Systems

II. Physical Examination: Eyes and skin are primary interest. The signs to look for are cataracts and burns.
a. Eyes. Describe the condition of the skin around the eyes as well as the eye itself. Slit Lamp examination should be done as soon as practicable. If any question is raised due to the slit lamp exam, refer patient to an ophthalmologist for dilated slit lamp examination.
b. Skin. Observe for signs of heat-induced change and electrical burn. Note findings, even negative ones.

III. Laboratory Studies: These should be as indicated. No single test has any particular value. Routine Tests, if done should be limited to CBC and UA. Any others should be done for clinical reasons.

IV. Referral: As clinically indicated through the normal channels.

V. Special Cautions:
a. Patient anxiety due to assault by an invisible agent. They are usually unfamiliar with the possible results of an overexposure and often have filled in the blanks with generalized fears of cancer, birth defects, and sterility. Unless there is an obvious connection between a finding and the exposure, other than a temporal one, the exposure and the finding are probably not connected. If you don't know, say so, but try to find out to put the patient's fears to rest.
b. Epidemiological studies to date have not demonstrated any long term consequences beyond those present at the time of the exposure.

Upon completion of the medical and field investigations, the patient alleging exposure must be advised of the findings and provided a copy of the written report. The patient should receive a complete explanation of the findings and given a chance to ask questions regarding his/her alleged exposure. Bioenvironmental Engineering and the attending AF physician should be available to answer any technical or medical questions during the final briefing of the patient.

Toluene

OSHA PEL: 200 ppm ACGIH TLV: 50 ppm
AF OEL: 50 ppm AF Action Level: 25 ppm

Entry into Medical Surveillance: Personnel shall be entered into medical surveillance when they are exposed over the action level for more than 25 days per year or 10 days in a quarter. Personnel shall receive a pre-placement, annual and termination exam.

Physical Exam:
Medical History
Occupational History
Neurologic Exam (including gait, coordination, mental status)
Pupils (dilation)
Skin (dermatitis)
Liver (enlarged)
Complete Blood Count (WBC, HGB, HCT, MCV, MCH, MCHC)
Electrolytes
Liver Function Tests

1,1,1-Trichloroethane (Methyl Chloroform)

OSHA PEL: 350 ppm ACGIH TLV: 350 ppm
AF OEL: 350 ppm AF Action Level: 175 ppm

Entry into Medical Surveillance: Personnel shall be entered into medical surveillance when they are exposed over the action level for more than 25 days per year or 10 days in a quarter. Personnel shall receive a pre-placement, annual and termination exam.

Physical Exam:
Medical History
Occupational History
Dermatitis
Neurologic Exam (equilibrium, coordination)
Conjunctival injection

Xylenes (o-, m-, and p- Isomers)

OSHA PEL: 100 ppm ACGIH PEL: 100 ppm
AF OEL: 100 ppm AF Action Level: 50 ppm

Entry into Medical Surveillance: Personnel shall be entered into medical surveillance when they are exposed over the action level for more than 25 days per year or 10 days in a quarter. Personnel shall receive a pre-placement, annual and termination exam.

Physical Exam:
Medical History
Occupational History
Conjunctivae for irritation
Slit-lamp exam of corneas if indicated by symptoms
Dermatitis
Gait (Ataxia)
CBC (WBC, Hgb, Hct, MCV, MCH, MCHC)
Liver Function Tests
Renal Function (BUN, creatinine)

Fire Fighters
(Reference: NFPA 1582, 2000 Edition)
(Note: This exam is a Fit-For-Duty Exam, and not an Occupational Exam)

EXAMINATION	PRE	PERIODIC	TERM	Rationale and Notes
Audiogram	X	Annually	X	NFPA 1582, [1] [3]
Health History	X	Annually	X	NFPA 1582, [4]
Hep B Vaccine	X		X	NFPA 1582, [7]
Ht, Wt, BP, Heart rate & rhthy	X	Annually	X	NFPA 1582
IPPD	X	Annually	X	NFPA 1582
Lipids (Chol, Trig, HDL, LDL)	X	Annually	X	DoD 6055.5-M, [1]
Occupational History	X	Annually	X	NFPA 1582, [4]
Physical Examination	X	Annually	X	NFPA 1582, [1] [2] [5]
Pulmonary Function Test	X	Annually	X	NFPA 1582, [1]
Tetanus vaccine	X	Annually		NFPA 1582, [6]
Visual Acuity & Periph vision	X	Annually	X	NFPA 1582, [1]
Workplace Exposure Summary	X	Annually	X	

[1] Examined according to the following schedule:
Ages 29 and under - every 3 years
Ages 30 to 39 - every 2 years
Ages 40 and above - every year

[2] Physical Exam to include the following systems: dermatological, ears, eyes, nose, mouth, throat, cardiovascular, respiratory, gastrointestinal, genitourinary, endocrine and metabolic, musculoskeletal, neurological

[3] If noise dosimetry shows exposure >84dBA for 8 hour work day then audiogram required annually in accordance with the Hearing Conservation Program
[4] Medical history and occupational history- an interval history will be obtained annually; occupational history will include significant exposures

[5] Military and civilians have different placement and retention standards. Military see AFMAN 36-2108, civilians see NFPA standard 1582, chapter 3.

[6] Tetanus vaccine given every 10 years
[7] If hepatitis B vaccine declined by civilians must sign written declination.
[8] Respirator questionnaire required for all personnel who wear respirators

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