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AIR FORCE OCCUPATIONAL SAFETY AND HEALTH STANDARD 48-20

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Aerospace Medicine

OCCUPATIONAL NOISE AND HEARING CONSERVATION PROGRAM

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This standard (std.) implements policy and updates responsibilities and procedures for administering the Air Force (AF) Hearing Conservation Program (HCP) to prevent occupational illness and injuries under Federal and Department of Defense (DoD) references. Major Commands (MAJCOM), Direct Reporting Units (DRU), and Field Operating Agencies (FOA) may supplement this standard when additional or more stringent safety and health criteria are required. (NOTE: Air Force Reserve (AFR) and Air National Guard (ANG) will collectively be referred to as the Air Reserve Component (ARC). They are also both considered MAJCOMS). Refer to Air Force Instruction (AFI) 91-301, *Air Force Occupational and Environmental Safety, Fire Protection and Health (AFOSH) Standards*, for instructions on processing supplements or variances. This publication requires the collection and or maintenance of information protected by the Privacy Act (PA) of 1974. The authorities to collect and or maintain the records prescribed in this publication are Title 37 *United States Code*, Section 301a and Executive Order 9397, *NUMBERING SYSTEM FOR FEDERAL ACCOUNTS RELATING TO INDIVIDUAL PERSONS,* November 22, 1943. Forms affected by the PA have an appropriate PA statement. System of records notice F044 AF SGE Medical Record System (December 9, 2003, 68 FR 68609) applies. This is authorized by 10 U.S.C., Chapter 55, Medical and Dental Care, 10 U.S.C., Sec 8013, Power and Duties of the Secretary of the Air Force, and Executive Order 9397. Report conflicts in guidance between this standard, Federal standards, or other Air Force directives through MAJCOM, DRU, or FOA channels to Headquarters (HQ) AFMOA/SGPP, 110 Luke Avenue, Suite 405, Bolling AFB DC 20032 on AF Form 673, *Recommendation for Changes of Publication.* Maintain and dispose of records created as a result of prescribed processes in accordance with the *Records Disposition Schedule* (will convert to AFMAN 33-322, Volume 4) found at **https://webrims.amc.af.mil**.

All AF Active Duty, Reserve, and National Guard military and civilian personnel are covered by this standard. This includes all appropriated fund, non-appropriated fund (NAF), seasonal, and temporary personnel. Foreign national employees are also included unless exempt by other agreements. Contractors must comply with state and Federal noise standards and are exempt from compliance with this standard. Contract personnel should not be enrolled in the AF Hearing Conservation Program (HCP) unless HCP services are included in the contract. HCP services will not normally be included in contracts. This standard

does not apply to community noise situations and provides a reference on how community noise (including base housing) is addressed by the Air Force.

This standard meets or exceeds requirements of Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.95, *Occupational Noise Exposure,* Code of Federal Regulations, Title 5, Volume 1, Part 339, *Medical Qualification Determinations*, and Department of Defense Instruction (DoDI) 6055.12, *Hearing Conservation Program*, except for military unique situations. It also includes material from International Standards Organization (ISO*) 1999.2, Acoustics-Determination of Occupational Noise Exposure and Estimation of Noise Induced Impairment.*

Trade names of commercial products are used in this standard for illustration purposes only. Mention of these products does not constitute endorsement or recommendation for use by the United States Air Force (USAF). Referenced American National Standards Institute's (ANSI) standards may be obtained for a fee from ANSI at **http://webstore.ansi.org**.

SUMMARY OF CHANGES

This document is substantially revised. AFOSH Std. 48-19, *The Hazardous Noise Program*, has been incorporated into this standard. Public Health (PH) conducts occupational audiometric evaluations. PH will refer abnormal audiograms to the appropriate Primary Care Manager (PCM) for evaluation and will manage the follow-up testing program through patient disposition. *(NOTE: Air Reserve Component medical care does not include the use of PCMs, and any references to the term PCM as used in this instruction will refer to physicians assigned to the ARC medical unit. Additionally, an HQ USAF/SGO memo, 25 April 2005, reversed a previous initiative where each Primary Care Management/Element team manages occupational health responsibilities of the enrollees. Instead the memo directs that Flight Medicine (FM) will again resume the responsibility for occupational health and occupational medical exams for most Air Force installations. Thus, references to PCM or PCE in this standard will apply mainly to FM.)* Standard Threshold Shift (STS) and Occupational Safety and Health Administration (OSHA) hearing loss recording/reporting criteria have been changed to comply with current OSHA guidance, 29 Code of Federal Regulations (CFR) 1904, Occupational Injury and Illness Recording and Reporting Requirements. AFOSH Std. 48-19 Chapter 3, Requirements, and Chapter 4, Hazardous Noise Surveillance, have been combined into one new Chapter 3, and relevant information from AFOSH Std. 48-19 Chapter 5, Hazardous Noise Control, has been included in Chapter 6 of this document. Other additions from the Hazardous Noise Program include consolidation of the Responsibilities and Hearing Protection Sections into their respective sections of this standard. The new changes in determining a STS (AF will no longer use the single frequency 15 decibel (dB) change in determining STS) in hearing for better (negative) or worse (positive) have been added. The implementation of an "Occupational Health Consultant" should assist Bioenvironmental Engineering (BE) and PH to educate PCM teams on all applicable aspects of occupational medicine, including review of problem audiograms. Changes in the test environment requirements are established. The availability for an evaluation of hearing protective devices (HPD) that are not managed by the Defense Supply Center Philadelphia and do not have a National Stock Number (NSN) is covered. Guidance on the proper use of the Fitness and Risk Evaluation is also included. The Hearing Conservation Data Registry (HCDR) no longer exists, however traditional HCDR functions have been assumed by the Air Force Institute of Operational Health, Safety and Health Division (AFIOH/RSH).

1. Overview

1.1. The USAF Hearing Conservation Program (HCP) is a component of the AFOSH Program designed to protect workers from the harmful effects of hazardous noise. This requires identifying all areas where workers are exposed to hazardous noise and reducing exposure through engineering or administrative controls, personal protective equipment (PPE), or worker placement. (Also refer to AFOSH Standard 91-501, *Air Force Consolidated Occupational Safety Standard)*.

1.2. The Aerospace Medicine Squadron/ Air Reserve Component (ARC) Medical Unit Commander is the manager for the occupational health program. Hearing conservation issues will be considered through the Occupational Health Working Group (OHWG) just as any other occupational exposure, except that an audiologist, if assigned, should participate in the OHWG. BE/PH personnel provide advice/consultation to the OHWG. The BE staff conducts workplace evaluations to identify workers potentially exposed to harmful noise levels. The PH staff conducts the audiometric testing program, fits Hearing Protection Devices (HPDs) at initial audiograms and provides counseling on audiometric results, monitors audiometric compliance, and tracks compliance of follow-up tests and ensures referrals are made to the appropriate PCM team and/or regional audiology/hearing conservation referral center. PH personnel evaluate HPD fit upon detection of a Standard Threshold Shift (STS), and notify workers with a STS, and their supervisors, within 21 days of determination. PH personnel will provide the base Safety Office information concerning OSHA reportable hearing loss as codified in 29 CFR 1904.10, *Occupational Injury and Illness Recording and Reporting*. ARC variations involve other hearing conservation certified medical Air Force Specialty Codes in accomplishing audiometric evaluations. The Occupational Health Consultant is a physician, usually a Flight Surgeon, that serves as consultant to PCM teams for operational health concerns, including review of problem audiograms, to determine if further testing is required before disposition, coordinates or conducts Fitness and Risk Evaluations and conduct PCM training on the HCP. An audiologist can serve as a consultant for audiology/hearing conservation review/disposition concerns.

2. RESPONSIBILITIES/PROCEDURES

2.1. **Surgeon General Aerospace Medicine Policy and Operations Division (HQ USAF/SGOP) will** :

2.1.1. Provide policy guidance and coordination on hearing conservation matters in the AF.

2.1.2. Serve as the principal AF point of contact with Federal and DoD regulatory agencies controlling occupational exposure to hazardous noise.

2.1.3. Identify USAF Hearing Conservation Diagnostic Centers (HCDC) and Hearing Conservation Centers (HCC) used for the evaluation of personnel with hearing loss in support of the HCP. See **Attachment 3** for a list of authorized HCDC/HCCs.

2.1.4. Ensure operations involving occupational exposure to hazardous noise establish and maintain HCPs in compliance with Federal and DoD requirements. Such programs shall encompass the minimum requirements in DODI 6055.12.

2.1.5. Designate an audiologist and a provider (preferably an Otologist, Otolaryngologist, Occupational Medicine Physician, Aerospace Medicine Specialist (AFSC 48AX or Flight Surgeon) to provide consultative services for MAJCOMs, DRUs, and FOAs on the HCP.

2.2. **Headquarters (HQ) Air Force Safety Center (AFSC) Operational Safety (SEGO) will:** establish policy for safety programs associated with hazardous noise exposure.

2.3. **Major Commands (MAJCOM), ARC, Direct Reporting Units (DRU), and Field Operating Agencies (FOA) will:**

2.3.1. Resource and provide policy guidance to assist installations with meeting the HCP requirements in DODI 6055.12 and this AFOSH Standard.

2.3.2. Designate a representative to oversee the command or equivalent HCP.

2.3.3. MAJCOMS will staff and equip the HCDC/HCCs to provide the following:

2.3.3.1. The HCDC and HCC audiologist will provide regional Hearing Conservation (HC) referral support (current HCDC/HCC listing maintained by the Safety and Health Division at the Air Force Institute of Operational Health (AFIOH/RSH). Testing capabilities will include, at a minimum, pure tone air and bone conduction threshold testing, the full range of speech audiometry, immittance audiometry, auditory evoked potentials, and otoacoustic emissions. HCDC minimum staffing will consist of an otolaryngologist, audiologist, and support personnel. HCC minimum staffing will consist of an audiologist and support personnel.

2.3.3.2. Ensure all audiologists assigned have attended a clinical orientation at the Audiology and Speech Pathology Clinic, Wilford Hall Medical Center; and the Hearing Conservation Technician Course.

2.4. **Air Force Materiel Command Office of the Command Surgeon, Aerospace Operations Division (HQ AFMC/SGP) will:**

2.4.1. Serve as the principal coordinator on occupational noise studies conducted during weapons systems development.

2.4.2. Review AFMC Programmatic Environmental, Safety and Health Evaluations (PESHE) and ensure hazardous noise is addressed and controlled to prevent hearing loss and adverse affects.

2.5. **Air Force Institute for Operational Health (AFIOH), Health and Safety Division (RSH) will:**

2.5.1. Provide consultative services to measure, evaluate, and recommend controls and solutions for occupational noise concerns within the AF. Operational noise concerns include, but are not limited to speech interference and communication limitations.

2.5.2. Have specialized noise-measuring equipment necessary to monitor and record various types of noise of biological significance or which might interfere with successful conduct of AF operations.

2.5.3. Interpret and provide MAJCOM and base-specific reports communicating interpretation of results, as requested.

2.5.4. Evaluate any unique or unusual noise problems at the request of the MAJCOM.

2.5.5. Maintain an information repository on noise characteristics of noise producing equipment typically found in AF industrial workplaces.

2.5.6. Provide HC consultation and HC reports to Air Staff/MAJCOM/installations upon request. Appoint an audiologist as the AF Hearing Conservation Program Manager (AF HCPM).

2.5.7. Report annually through HQ AFMC/SGP to HQ USAF/SGOP, and the Air Force Safety Center (AFSC/SEG) on the incidence of permanent threshold shift (PTS) per DoDI 6055.1, E3.11.3.4.

2.5.8. Evaluates AF HCP effectiveness, annually, based on the prevalence of STSs during the annual audiograms, and on the percent of identified personnel receiving annual audiograms.

2.5.9. Evaluate and report recommendations for corrective action to installation level HCP managers and to the MAJCOMs (SGP) when Department of Defense Occupational and Environmental Health Readiness System (DOEHRS) Data Registry (DR) program indicators exceed acceptable parameters.

2.6. **United States Air Force School of Aerospace Medicine (USAFSAM) will:**

2.6.1. Conduct formal Council for Accreditation in Occupational Hearing Conservation (CAOHC)-approved training, for DoD personnel (military and civilian) who perform audiograms.

2.6.2. Provide and track AF certification numbers to students within 10 days of completion of CAOHC training.

2.6.3. Conduct training for PH Officers and skill-level appropriate 4E0X1 course material that addresses components of HCP administration/management. Provide CAOHC hands-on and didactic DOEHRS-HC training for 4E0X1 personnel for the HCP.

2.6.4. Conduct training for providers on audiogram review, audiogram consultation, referrals, and Fitness and Risk Evaluations.

2.6.5. Conduct training for BE that addresses collection and interpretation of hazardous noise data and personal noise exposure data as outlined by Federal, DoD and AF standards.

2.6.6. Provide and track AF HC certification numbers of personnel who are trained IAW the CAOHC. NOTE: AF personnel who receive CAOHC approved training at civilian agencies must register certification information with the AF HCPM and receive an AF certification number prior to conducting audiometric testing.

2.6.7. Provides HC orientation training for newly assigned AF audiologists.

2.7. **Wing Commanders will:**

2.7.1. Run an integrated installation hazardous noise protection program, which includes noise control by operational means, building design, and land use planning.

2.7.2. Assure the MTF or ARC Medical Unit Commander is informed of each new operation, job, or process before the start of regular operations.

2.7.3. Ensure work areas identified as hazardous noise areas are clearly marked.

2.7.4. Ensure proper corrective action is taken for noise related Risk Assessment Codes (RACs).

2.7.5. Ensure the use of HPDs and other noise control methods; encourages the use of HPDs for installation recreation facilities with hazardous noise sources (auto hobby, skeet, etc.).

2.7.6. Ensure HCP is an annual standing agenda item for the ESOH Council. Program effectiveness will be evaluated; information to be briefed may include the number of shops and personnel on the program, number of STS and PTS, percent requiring follow-up, etc.

2.8. **Squadron Commanders and Workplace Supervisors will:**

2.8.1. Protect the hearing of assigned personnel by ensuring protective engineering controls, administrative controls, and personal protective equipment are used correctly by all workers; ensure workplace complies with all OSHA, DoD and AF HCP requirements.

2.8.2. Identify potentially hazardous noise areas (as identified by BE) with signs located at their entrances or boundaries.

2.8.3. In consultation with BE, ensure each tool or piece of equipment producing noise levels greater than or equal to 85 dBA, including vehicles, shall be conspicuously marked, where feasible, to alert personnel of the potential hazard. The exception shall be when an entire space is designated a "hazardous noise area," and the equipment is stationary. Exteriors of military combatant equipment are excluded from this requirement. Professional judgment and discretion shall be exercised when labeling tools and equipment.

2.8.4. Use signs and decals describing (words or with other visual symbols) the potential hazard and the protective measures taken shall be used to designate "hazardous noise areas" and "equipment"; e.g., "Danger," "Hazardous Noise," "Hearing Protection Required When in Operation." All symbols and decals shall, as a minimum, comply with 29 CFR 1910.145.

2.8.5. Inform the BE Flight/ Element, or BE/PH Staff at ARC bases, if workplace equipment, or practices and procedures involving potentially hazardous noise exposure changes so they may evaluate noise exposure levels.

2.8.6. Use engineering controls as the primary means of eliminating personnel exposure to potentially hazardous noise. All practical design approaches to reduce noise levels to below hazardous levels by engineering principles shall be explored. Priorities for noise control resources shall be assigned based on the applicable risk assessment code (RAC). Where engineering controls are undertaken, the design objective shall be to reduce steady-state levels to below 85 dBA, regardless of personnel exposure time, and to reduce impulse noise levels to below 140 dB peak sound pressure level (SPL). Engineering controls shall be applied to "military-unique workplaces," within the constraints of maintaining combat readiness.

2.8.7. Ensure new equipment being considered for purchase has the lowest sound emission levels that are technologically and economically possible and compatible with performance and environmental requirements. 42 U.S.C. 4914, *Public Health and Welfare, Noise Control, Development of Low-Noise Emission Products,* applies.

2.8.8. Include appropriate acoustics in specifications for all new facilities, equipment, and substantial modification projects. The objective shall be to ensure, if possible, a steady-state level less than 85 dBA at all personnel locations during normal operations.

2.8.9. Ensure compliance and availability of HPDs for workers exposed to hazardous noise. Instruct personnel on HCP and care/hygiene of their HPDs (see paragraph **5.15.1.** for more details)

2.8.10. Ensure workers with an occupational exposure to hazardous noise complete an initial/reference audiogram and receive HCP training within 30 days from the date of the workers' initial exposure to hazardous noise.

2.8.11. Conduct initial and annual workplace-specific hearing conservation training on shop or unit hazardous noise exposures and equipment. Document all training on the worker's AF Form 55, **Record of Training,** or equivalent. Training must cover:

2.8.11.1. The effects of noise on hearing and the purpose of hearing protection.

2.8.11.2. The advantages, disadvantages, and attenuation of various hearing protectors.

2.8.11.3. Mandatory requirement of assigned protective equipment, and administrative actions that may follow for failure to wear.

2.8.11.4. The purpose of audiometric testing and an explanation of test procedures.

2.8.11.5. Hearing loss may lead to disqualification from current duties, if hearing is critical to job performance.

2.8.11.6. Notify each employee of their BE noise exposure monitoring results.

2.8.12. Ensure personnel on the HCP are made available for examination and attend scheduled medical appointments. Personnel scheduled for a noise-free audiogram (NFA) will remain noise free from occupational hazardous noise sources for at least 14 hours prior to testing.

2.8.13. Encourage the use of hearing protection off duty when exposed to hazardous noise.

2.8.14. Post a copy of 29 CFR 1910.95, *Occupational Noise Exposure*, in the workplace so that it is available to employees.

2.8.15. Assist with filling out AF Form 1754, **Job Capability and Safety Analysis**.

2.8.16. In accordance with OSHA regulation 29 CFR 1910.95 (e), notify each employee exposed at or above an 8-hour Time Weighted Average (TWA) of 85 dBA of the results of the noise monitoring performed by BE.

2.8.17. Notify each worker of hazardous noise sources in the workplace, provide information to BE about work practices and procedures involving potential exposure to hazardous noise to allow proper surveys and evaluations of the workplace.

2.8.18. Maintain accurate rosters of personnel occupationally exposed to hazardous noise. Provide updates to medics at least semi-annually or upon request. Ensure that all newly assigned and departing personnel are scheduled for and receive required audiograms.

2.9. **Directors of Base Personnel (Military and Civilian) will:**

2.9.1. Evaluate and reassign personnel, based on medical supervisory and Ground Safety recommendations to a suitable workplace. Include those awaiting reasonable accommodations in, denied placement in, or removed from, hazardous noise-related jobs.

2.9.2. Ensure workers receive a pre-placement hearing test/medical clearance, before being hired or transferred into a position that includes hazardous noise duties.

2.9.3. Upon request from HCPM or PCM, prepare an AF Form 1754 with minimum, essential tasks that a worker must perform to qualify for or be retained in a position to allow the PCM to conduct a worker's Fitness and Risk Evaluation.

2.9.4. Review and evaluate, with local HCPM, civilian hearing loss claims submitted to the Department of Labor Office of Workers' Compensation Program (OWCP) for the purpose of determining if a claim should be controverted.

2.9.5. Report annually to the HCPM and the Environment Safety and Occupational Health (ESOH) Council, the number of civilian claims filed for noise-induced hearing loss and the cost of the award.

2.9.6. Civilian Personnel office will forward a copy of any hearing loss claims to Hearing Conservation Program Manager (HCPM).

2.10. **Wing and/or Base Ground Safety will:**

2.10.1. Report OSHA Reportable hearing losses on the OSHA Form 300, *Reportable Injury/Illness Log,* or electronic equivalent.

2.10.2. Perform Fitness and Risk Evaluations by conducting the Job Safety Analysis, AF Form 1754 Part 4.

2.10.3. Report noncompliance with HCP to the supervisor. Identify newly added noise hazard work tasks or areas noted during periodic safety inspections to BE.

2.11. **MTF and ARC Medical Unit Commander will:**

2.11.1. Ensure a comprehensive HCP is available.

2.11.2. Appoint the Chief, Aerospace Medicine to be the Hearing Conservation Program Manager (HCPM). Many of the functions may be designated to an audiologist, occupational medicine physician, or senior flight surgeon.

2.11.3. Ensure that personnel (civilian and military) performing audiograms have CAOHC certification and an AF certification number issued by the AF or other DoD component.

2.12. **Hearing Conservation Program Manager (HCPM) will:**

2.12.1. Ensure procedures are established to identify, schedule, and monitor all personnel on the HCP.

2.12.2. Ensure only audiometers meeting the standards of the ANSI S3.6-1996, *Specification for Audiometers,* are used in the HCP.

2.12.3. Review HCP for adequacy/appropriateness to protect workers from hazardous noise. Include adequacy of education, audiogram completion rates, and adverse hearing loss trends in relationship to workplaces/Air Force Specialty Codes/HPD usage, etc. Note: the OHWG is the proper forum to evaluate program and address concerns.

2.12.4. Trend and analyze hearing loss compensation data and DOEHRS-HC reports; attend and provide consultation on the HCP for the OHWG.

2.12.5. Conduct hearing related Fitness and Risk evaluations IAW para **7.6.2.** and send copies of Fitness and Risk evaluations performed to MAJCOM, DRU, or FOA SG for review by the designated hearing conservation consultant.

2.12.6. Analyze claims submitted for hearing loss under the Department of Labor's OWCP. Assess the claim and advise the injury compensation specialist if the claim should be disputed.

2.12.7. Ensure the most current version of DOEHRS-HC (or current HC software application) is used, and technicians are adequately trained on the program.

2.13. **Occupational Health Consultant will:**

2.13.1. Review "problem audiograms" (reference para **2.15.7.4.1.**) and determine if further evaluation is needed per OSHA requirements (29 CFR 1910.95). If follow up care is needed, request HCDC/HCC consultations or medical referrals for personnel who fall into the referral criteria at Table 2.1.

2.13.2. Ensure medical recommendations restricting hazardous noise exposure are based upon:

2.13.2.1. Failure of the worker to meet medical standards as defined in AFI 48-123, *Medical Examination and Standards,* Air Force Manual (AFMAN) 36-2108, *Enlisted Classification,* AFMAN 36-2105, *Officer Classification,* and 5 CFR 339 for job placement.

2.13.2.2. Inability of the worker to perform the essential functions of the job.

2.13.2.3. Probability of the worker endangering themselves or others if allowed to work in a noise hazard environment. Consider the Operational Risk Management (ORM), AFI 90-901, *Operational Risk Management*, matrix for assistance in the decision making process.

2.13.3. Ensure recommendations are made for reasonable accommodations that allow a hearing impaired worker to perform duties in a noise hazard environment without undue risk to personal safety and health or the safety of others (See chapter 7 on Fitness and Risk Evaluations).

2.13.4. Ensure workers who are qualified for duty in hazardous noise areas, or processes, are able to capably perform essential job tasks and do not pose a safety risk to themselves or others.

2.13.5. Attend and provide consultation to the OHWG on HCP matters.

2.14. **Bioenvironmental Engineering (BE) will:**

2.14.1. Perform noise surveys and dosimetry to quantify noise hazards as described in Chapter 3. Work with PMEL personnel to ensure calibrations and certifications are performed according to ANSI S14-1983, *Specification for Sound Level Meters.*

2.14.2. Complete the *Occupational and Environmental Health Exposure Data (OEHED)* or the equivalent workplace exposure data summary for the OHWG, including the 8-hour TWA and required HPDs.

2.14.3. Provide shop supervisors the results of their area's noise surveys. This information should include hazard and required controls (Engineering, administrative, and/or HPD.) This can be in the form of the certified PPE list.

2.14.4. Assess the adequacy of all controls used to reduce noise exposures including hearing protectors per Chapter 5, and evaluate industrial work areas where adverse hearing loss trends are noted.

2.14.5. Assist with the Fitness and Risk Evaluations upon request of provider.

2.14.6. Review facility and operations plans for new or modified facilities to ensure noise exposure control is appropriately considered.

2.14.7. In conjunction with the shop supervisor, assess the feasibility of engineering controls for hazardous noise equipment/areas.

2.14.8. BE will collect accurate rosters of personnel exposed to hazardous noise during shop visits IAW AFMAN 48-146, *Occupational and Environmental Health Program and Information Management*. BE will share rosters with PH.

2.14.9. Conduct work place assessments to support occupational illness/injury investigations and claims for hearing loss.

2.15. **Public Health (PH) will:**

2.15.1. PCM/E and PH will track and monitor occupational exam compliance of workers on the HCP.

2.15.2. Track personnel on the HCP in conjunction with shop supervisors with the current occupational health computer software.

2.15.3. Perform audiometric testing using the DOEHRS-HC Software.

2.15.4. Enroll personnel identified by supervisors as occupationally exposed to hazardous noise, (by BE survey and recommended by OHWG), into a testing program that includes pre-placement, periodic (at least annually), and termination audiograms.

2.15.5. Conduct audiometric testing in accordance with the following:

2.15.5.1. Be performed by a licensed or certified audiologist, otolaryngologist, physician; or by a technician certified by the Council for Accreditation in Occupational Hearing Conservation (CAOHC) or who has completed equivalent training. Standard instructions shall be given to individuals before testing (see **Attachment 9**).

2.15.5.2. Be conducted in a BEE certified testing environment with background octave band sound pressure levels (SPLs) not greater than the following:

- For 500 Hertz (Hz), 27 dB.
- For 1000 Hz, 29 dB.
- For 2000 Hz, 34 dB.
- For 4000 Hz, 39 dB.
- For 8000 Hz, 41 dB.

The test environment shall be resurveyed annually using equipment conforming at least to the Type 1 requirements of the latest approved ANSI Standards S1.4A to S1.4-1983 and the order 3 extended range requirements of the latest approved ANSI Standard S1.11-1993.

2.15.5.3. Include pure tone, air conduction, and hearing threshold examinations of each ear at the test frequencies of 500, 1000, 2000, 3000, 4000, and 6000 Hertz (Hz).

2.15.5.4. Be performed on audiometers calibrated to the specifications of the latest approved ANSI Standard S3.6-1996. Audiometers must receive annual electro-acoustic calibration.

2.15.5.5. Be conducted on audiometers that have received a functional and biological operation check before each day's use. For specifications see 29 CFR 1910.95 (h)(5)(i).

2.15.6. Conduct audiometric monitoring for reference and/or pre-placement audiograms (DD Form 2215, **Reference Audiogram**) according to the following:

2.15.6.1. Military personnel, during training or prior to initial assignment to duty where audiograms are required, shall receive a reference audiogram. Use every effort to conduct a reference audiogram on civilian workers before assignment to duties involving hazardous noise. A reference audiogram shall not be conducted more than 30 days from the date of the worker's initial exposure to hazardous noise. The first valid hearing test administered is the reference audiogram and the worker shall be informed to avoid high levels of occupational or non-occupational noise exposure during a 15-hour period preceding the examination. Hearing protectors shall not be used to meet the noise-free requirement.

2.15.6.2. An Audiometric Case History (AF Form 1753, **Hearing Conservation Examination** - Section I) shall be completed on all reference audiograms. If worse than H-1 hearing levels are noted, or if personnel answer "yes" to asterisked questions, then a clinical examination is required, and the remainder of AF Form 1753 must be completed.

2.15.6.3. Workers terminated from the HCP who subsequently return to hazardous noise duties should have a current audiogram compared to their original reference audiogram. If the current results do not indicate a STS, the original DD Form 2215 will serve as the reference audiogram. If an STS is present, use the new audiogram to establish a reference.

2.15.7. Complete annual audiograms and document them on DD Form 2216, **Hearing Conservation Data,** in accordance with the following:

2.15.7.1. Personnel exposed to hazardous noise levels exceeding the standard in para **3.1.**, shall receive annual audiograms. Examine the fit and condition of pre-formed and custom earplugs at the time of the annual audiogram.

2.15.7.2. A Standard Threshold Shift (STS) shall include a change in hearing threshold relative to the current baseline audiogram of an **average** of 10 decibels (dB) or more at 2000, 3000, and 4000 Hz, in either ear. Age corrections will not be applied.

2.15.7.3. When an individual's audiogram shows an STS relative to the reference audiogram in either ear the following must be accomplished:

2.15.7.3.1. If a negative STS, improved hearing threshold from reference audiogram, is noted, one 14-hour NFA is required. That may be administered the same day as the periodic test. The results may be used to create a re-established reference audiogram, to reflect the improvement in pure tone acuity.

2.15.7.3.2. If a positive STS, decrease in hearing threshold from reference audiogram, is noted, a 14-hour NFA must be administered. Follow-up testing must be done within 30 days of the annual audiogram. If the follow-up tests are performed more than 30 days after the annual audiogram, then the annual audiogram must be considered a PTS, regardless of the results of the follow-up tests.

2.15.7.3.2.1. If the results of the first follow-up NFA do not indicate a STS, a second follow-up test is not required, and the shift is considered a temporary threshold shift (TTS). If there is a STS on the 14-hour NFA, a second 14-hour NFA will be performed. The second 14-hour NFA may be performed immediately.

2.15.7.3.2.2. If a STS is noted on the second NFA, then the STS should be considered a permanent threshold shift (PTS).

2.15.7.3.2.3. Ensure provider performs an ear inspection, prior to the NFA, to determine if cerumen removal or other treatment is necessary to obtain an accurate audiogram. AF Hearing Conservationists are sufficiently trained to perform otoscopic examination.

2.15.7.4. All patients with a PTS or problem audiogram will be referred back to a provider or to an audiologist. They determine what further follow-up is required. Table 2.1 provides referral criteria to determine the need for an AF HCDC/HCC evaluation. A physician shall make any determination that the noise-induced STS is not work-related or has not been aggravated by occupational noise exposure.

2.15.7.4.1. Problem audiograms are audiograms that show large differences in hearing thresholds between the two ears, audiograms that show unusual hearing loss configurations that are atypical of noise induced hearing loss, and audiograms with thresholds that are not repeatable.

2.15.7.4.2. The worker is required to complete Section I of the AF Form 1753, prior to medical referral for PTS.

2.15.7.4.3. The audiologist, otolaryngologist, or physician shall review problem audiograms and shall determine whether there is a need for further evaluation. At a minimum they shall have access to:

2.15.7.4.3.1. A copy of the requirements for hearing conservation.

2.15.7.4.3.2. The baseline audiogram and most recent audiogram of the employee evaluated.

2.15.7.4.3.3. Measurements of background sound pressure levels in the audiometric test room.

2.15.7.4.3.4. Records of audiometer calibrations as required.

2.15.7.5. When an audiologist or physician confirms the PTS, the individual shall be notified in writing within 21 days of such determination, and the condition entered in the individual's medical record. The individual shall be refitted with hearing protection, instructed in its care and use, and encouraged to wear the hearing protection. Supervisors shall be notified, in writing, that the worker has experienced a decrease in hearing. The notification letter shall not contain additional 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.

2.15.7.6. A new reference audiogram shall replace the original reference audiogram when the medical evaluation confirms the STS noted during the annual and follow-up audiograms is permanent. The original reference audiogram shall be retained in the patient's medical record on a DD Form 2215. A revised reference audiogram should also be established when the hearing threshold demonstrated on the annual and follow-up audiograms indicate significant improvement over the existing reference audiogram. For a positive STS, the reviewing audiologist or physician shall choose one of the following options for reestablishing the reference audiogram:

2.15.7.6.1. Use the results of the most recent follow-up test.

2.15.7.6.2. Use the results of the audiology referral (if all pertinent examiner and audiometer information are available for the DD Form 2215).

2.15.7.6.3. Conduct a separate hearing test and DD Form 2215 and use it as a reference.

2.15.8. Complete a termination audiogram when a worker enrolled in the HCP is about to stop working in designated hazardous noise areas. Personnel moving to other DoD jobs involving hazardous noise exposure need not be given a termination audiogram unless they change the DoD Component. An audiogram conducted within 12 months can be considered a termination audiogram.

2.15.9. Report permanent STS results of workers with hearing threshold shifts meeting or exceeding 25 dB average at the same frequencies to Base Ground Safety office for inclusion on the OSHA 300 log or electronic equivalent. NOTE: When an OSHA-recordable hearing loss occurs from an instantaneous event (e.g., acoustic trauma from a one-time blast over pressure) the hearing loss shall be recorded as an "injury according to OSHA-recommended guidelines." National Institute for Occupational Safety and Health (NIOSH) age corrections shall NOT be used for calculating an OSHA recordable hearing loss. That loss shall only be reported once unless an additional OSHA-recordable loss of hearing is incurred.

2.15.10. Track patients referred to HCDC/HCCs in conjunction with provider to ensure findings and recommendations are reviewed and appropriate action taken.

2.15.11. Ensure that appropriate audiometric DOEHRS-HC data is forwarded to the DOEHRS-DR, at least once a month.

2.15.12. Perform trend analysis for HCP outcome measures (i.e. test compliance, temporary threshold shift (TTS) and PTS rates). Use data to determine management actions to improve the HCP.

2.15.13. Ensure appropriate hearing protection is properly fitted to personnel exposed to hazardous noise. Document the date, type of HPD fitted, brand and noise attenuation provided, ensuring that the resultant noise level is below 85 dBA. (See para **5.13.** for method to determine HPD attenuation). If resultant noise level is greater than 85 dBA, recommend that the worker wear double hearing protection, and record the member's signature on an SF 600 or other suitable document and place the original form in the member's medical record; provide a copy to the member so the supervisor can document training on the AF Form 55 or its electronic equivalent in the workplace.

2.15.14. Annually brief the Occupational Health Working Group (OHWG) and ESOH Council on the HCP to include unit compliance rates and unit STS/TTS/PTS rates.

2.15.15. Conduct illness investigations related to reportable occupational hearing loss.

2.15.16. Semi-annually or when changes in operational requirements dictate, provide update to AFIOH/RSH with current contact information to include HCP Point-of-Contact (POC), mailing address, phone number and e-mail address.

2.15.17. Forward all completed HCP medical forms to the appropriate medical record authority for inclusion in the member's permanent outpatient medical record.

2.15.18. PH will conduct and document HCP training on a suitable document such as an SF 600 to notify supervisor at every initial and reference audiogram. Additionally, PH should provide

informal training at each audiogram re-emphasizing the importance of hearing protection. This is a “teachable moment”.

2.16. **Primary Care Manager (Flight Medicine for most bases) or ARC physician will:**

2.16.1. Consult with the Occupational Health Consultant on all problem audiograms and occupational hearing related referrals.

2.16.2. Develop knowledge of related OSHA/DoD/AFOSH guidance to ensure appropriate audiometric follow-up and disposition occurs (as detailed in this standard).

2.16.3. Perform worker medical evaluations and make clinical recommendations.

2.16.4. PCM/E and PH will track and monitor occupational exam compliance of workers on the HCP.

2.16.5. Determine if workers possess the minimum physical abilities needed to perform essential duties and responsibilities without undue risk to themselves or others.

2.16.6. Establish reference and periodic (annual and close scrutiny) evaluations to detect signs and symptoms of noise induced hearing loss at an early stage to prevent progression. HCPM is the point of contact.

2.16.7. Initiate Fitness and Risk Evaluations for personnel who exceed the H-1 profile and work in a hazardous noise area, and make a medical recommendation. Determine the extent of Fitness and Risk Evaluation.

2.16.8. Determine whether shift is related to Ear, Nose and Throat (ENT) condition. Advise worker of the condition and either treat or refer for treatment. If a physician determines the shift is not occupationally related (i.e. middle ear infection) the Medical Treatment Facility (MTF) is not responsible for the referral or treatment costs for civilian employees.

2.16.9. When indicated review, complete, and sign AF Form l753, *Hearing Conservation Examination.*

2.16.10. A provider will complete Section II of the AF Form 1753, before a baseline audiogram is re-established. An examination of the ears will be performed on patients with a PTS, those undergoing a Fitness and Risk Evaluation for hearing, and those getting a reference audiogram with worse than H-1 hearing levels or asymmetric hearing as defined in AFI 48-123, *Medical Examinations and Standards*, (greater than or equal to 25 dB difference between ears at any two consecutive frequencies). The results will be recorded on Section II. The provider should note:

- Condition of the external auditory canals and tympanic membranes.
- Presence of middle ear disease and Eustachian tube function.
- Any condition that may interfere with the wear of HPD (permanently or temporarily).
- Any abnormality that might adversely affect the audiogram results.

2.16.11. Determine appropriate additional referral criteria as needed.

2.16.12. Comply with Department of Labor Office of Workers' Compensation Programs (OWCP) Hearing Loss Medical Requirements (see **Attachment 10**) when completing physician and audiologist reports. Reports shall be supplemented by any recommendation for hearing aids, hearing

protection, further referral, or an interpretation of test results with site-of-lesion and a noise exposure history.

2.16.13. Use the American Conference on Governmental Industrial Hygienists (ACGIH) Threshold Limit Value® Committee's recommendation and restrict pregnant women after 20 weeks gestation from discharging firearms with larger than a .22 caliber round or noise exposure greater than 115 dBC TWA and peak 155 dBC to protect fetus' hearing.

2.16.14. Track patients referred to HCDC/HCCs in conjunction with PH to ensure findings and recommendations are reviewed and appropriate action taken.

2.17. **Hearing Conservation Diagnostic Centers (HCDC) and Hearing Conservation Centers (HCC).**

2.17.1. HCC will provide diagnostic care in support of the HCP. HCDC offer complete audiologic services and provide direct clinical support for referrals. Evaluations by certified military or state licensed civilian audiologists are permitted. An AF HCDC provides consultation and overview of referrals. An AF audiologist provides guidance so management and disposition of patients meet current AF standards. Guidance can be via "standing order" or record review. Record reviews can be accomplished by fax. Authorized HCDC/HCC are listed in **Attachment 3**.

2.17.2. Referral Criteria:

2.17.2.1. Medical providers may validate a PTS, but the Occupational Health Consultant or audiologist may be consulted to review problem audiograms to determine if further evaluation is required before re-establishing a reference audiogram.

2.17.2.2. Medical providers use Table 2.1 to determine HCDC, HCC, or licensed civilian audiology consultation as part of the Fitness and Risk Evaluation.

2.17.2.3. Aircrew members who fail to meet the requirements for continued flight duty should be evaluated as specified in AFI 48-123, *Medical Examinations and Standards*.

2.17.3. Processing Patient Referrals:

2.17.3.1. Providers complete the DOEHRS-HC generated SF 600e, *DOEHRS-HC Hearing Loss Referral* indicating reason for referral and request for care, and send patient to the appropriate administrative MTF function to schedule referral appointment.

2.17.3.2. MTF scheduler arranges appointment, travel orders, and notifies the patient, the patient's supervisor, PH, and the referring provider of the date, time, and location of the appointment.

2.17.3.3. The patient's medical record and referral information must be available to the HCDC/ HCC, or consultant at the time of the examination.

2.17.3.4. Civilian employees referred to a HCDC/HCC will be reimbursed IAW Joint Travel Regulation, Volume II, paragraph **4.** regarding travel and per diem allowances. In cases where a civilian worker requests an audiologic evaluation for other than an occupationally related condition, i.e. hearing aid assessment, the employee will pay for the evaluation and any associated travel costs.

2.17.3.5. Efforts should be made to refer patients to AF HCDC/HCC for evaluation. In cases where travel restrictions or finances prohibit referral to an AF HCDC/HCC, refer patient to a

licensed and/or certified civilian audiologist. Providers may consult with AF/SG Consultant for Audiology and Speech Pathology on military or civilian audiology service selections and results interpretation. An AF audiologist should review/consult on all audiometric evaluations performed by non-AF audiologists. A letter (See **Attachment 4**) may be attached to the DOEHRS-HC SF Form 600e, or the AF Form 1672, **Hearing Conservation Diagnostic/Center Referral**, when patients are sent to non-AF audiologists.

2.17.4. Reporting Results of the Referral Examination:

2.17.4.1. The HCDC/HCC audiologist or licensed/ certified civilian audiology consultant will provide to the referring provider a completed DOEHRS-HC generated SF 600e, *DOEHRS-HC Hearing Loss Referral* or AF Form 1672, a completed AF Form 1489, **Audiological Evaluation Results**, or equivalent, and patient disposition including reference audiogram re-establishment, return to duty or restrictions, and follow up required.

Table 1. Referral Criteria

CONDITION	RECOMMENDED ACTION
On pre-placement, have a hearing profile exceeding H-1 (see AFI 48-123)	Fitness and Risk Evaluation*
May not, for medical reasons, be able to perform the job capably or safely in a noise hazard environment.	Fitness and Risk Evaluation*
Have a PTS following 2nd Noise Free evaluation. (Audiologists and physicians are permitted by OSHA regulations to reestablish reference audiograms without HCDC/HCC referrals)	Referral to HCDC/HCC
Are unable to wear standard hearing protective devices.	Referral to HCDC/HCC
Complain of inability to correctly hear or understand routine spoken communications, auditory cues, and signals.	Referral to HCDC/HCC
Need special hearing skills and complain of hearing problems. (For example: Morse or voice intercept operators, air traffic controllers, etc.)	Referral to HCDC/HCC
Are unable to test using standard procedures or equipment.	Referral to HCDC/HCC
Have a 40 dB or greater difference between ears at any frequency. (Requires masked audiogram).	Referral to HCDC/HCC
Have asymmetric hearing loss greater than or equal to 25 dB difference between ears at any two consecutive frequencies.	Referral to HCDC/HCC (Once referral is completed annual f/u is not required if asymmetry is stable)
Exhibits behavior resulting in invalid or unreliable test results suggesting an exaggerated hearing loss or a problem unrelated to a known physical illness or disease	Referral to HCDC/HCC
Meet other referral criteria as determined by the consulting audiologist or program manager.	Referral to HCDC/HCC

*Fitness and Risk Evaluation may include referral to HCDC/HCC

2.18. **Occupational Health Working Group (OHWG) will:**

2.18.1. Ensure personnel that have occupational hazardous noise exposure that exceed levels as identified in Chapter 3 are monitored in the HCP.

2.18.2. Review the incidence of STS, TTS, PTS, and audiometric exam compliance rate to identify high-risk occupations and areas to determine if further interventions are necessary.

2.18.3. Review approved civilian hearing loss claims filed at the installation and determine appropriate actions (e.g. focused education, increased audiometric monitoring, coordination) with Safety for increased compliance monitoring, or other actions deemed necessary.

2.18.4. Document HCP decisions and recommendations in the OHWG minutes.

2.19. **Employees with Hazardous Noise Exposure will:**

2.19.1. Comply with all hazardous noise control measures including the proper use of hearing protection devices (HPD) and advise others in the workplace to wear HPD when exposed to hazardous noise. Personnel working in or entering designated "hazardous noise areas" shall always carry HPD. When noise sources are operating, personnel shall wear their HPD regardless of exposure time.

2.19.2. Wear HPDs off duty when operating hazardous noise producing equipment or tools, especially if exposure includes firearms.

2.19.3. Report for appointments to receive occupational health medical exams, and take the HPDs they use to their appointment.

2.19.4. Wear HPD when exposed to gunfire or artillery fire in test or training situations, during any duties involving direct flight line noise exposures, and any other activities in hazardous noise areas.

2.19.5. Report new or changes in operating procedures that affect workplace hazardous noise exposure to the supervisor and participate in noise exposure surveys and evaluations by wearing monitoring equipment as requested by BE.

2.19.6. Report to supervisor or medical personnel conditions that place themselves or others at risk for accident because of communication difficulty or the inability to hear warning signals.

2.19.7. As directed by the HCPM, receive an annual audiometric evaluation for inclusion in the HCP.

2.20. **Air Force Research Laboratory- Human Effectiveness Directorate (AFRL/HE)** will:

2.20.1. Maintain an AF research and development capability to address science and technology needs and requirements in physical acoustics.

2.20.2. Provide expert consultation to AF/SG on effects of physical acoustics, bioacoustics, hearing protection, and speech communication on AF operations.

2.20.3. Recommend to AF/SG exposure criteria and language for AF instructions and guidelines.

3. HAZARDOUS NOISE SURVEILLANCE REQUIREMENTS: Health protection criteria are summarized in table 3.1. Specific details are outlined in separate paragraphs.

3.1. **Noise Exposure Limits-Hearing:**

3.1.1. Limits. The permissible exposure limit (PEL) for noise are intended to prevent damage to the hearing of exposed personnel. These noise exposure limits are sound levels and durations to which nearly all workers may be exposed without permanent adverse effect on their ability to hear and understand normal speech.

3.1.2. Continuous or Intermittent Exposures. The duration of unprotected noise exposure per day shall not exceed the values specified in Table 3.2 for the levels indicated for continuous exposure. **The Air Force Reserve Command (AFRC) may publish supplemental policy establishing separate audiogram requirements for AFRC members.**

Table 2. Health Protection Criteria

Hearing Protection*	85 dBA, 8-hours or equivalent exposure times (See Table 3.2)
Criterion level	85 dBA
Exchange rate	3dB
Threshold level	80 dBA
Maximum level	115 dBA
Impulse Noise	No unprotected exposure above 140 dB (See **Attachment 2**)
Whole Body Effects*	No octave or one-third octave band level above 145 dB for frequencies from 1 Hz to 40 kHz
Ultrasound*	See Para. **3.2.3.**
Exposure to Music	
Patrons**	Leq.2h < 94 dBA
Employees*	Same as occupational standard
Air Force Musicians*	Same as occupational standard

* Based on recommendations from The Threshold Limit Values for Chemical Substance and Physical Agents & Biological Exposure Indices published by the American Conference of Governmental Industrial Hygienists; the current edition of this annual publication will be applied.

**Per AFIOH/RSH, exposure level is based on an assumption of 2 hours per week exposure using an 84 dBA criterion level.

Table 3. Limiting Values for Unprotected Noise Exposures*

Sound Level (dBA)	Time (minutes)	Sound Level (dBA)	Time (minutes)	Sound level (dBA}	Time (minutes)
Over 115	Forbidden				
115	0.5	102	9.5	89	190
114	0.6	101	12	88	240
113	0.7	100	15	87	302
112	0.9	99	19	86	381
111	1.2	98	24	85	480
110	1.5	97	30	84	605
109	1.9	96	38	83**	762
108	2.4	95	48	82**	960
107	3.0	94	60	81**	1210
106	3.8	93	76	80**	24 Hours
105	4.7	92	95	Below 80	No limit
104	6.0	91	120		
103	7.5	90	151		

* The A-weighted sound level is used to assess hearing damage risk due to noise exposure; for engineering noise control, other measures are required. The limiting duration of exposure at any noise level equal to or less than 115 dBA can also be determined from the equation:

$$\textit{Time, T (minutes)} = 480 \times 2^{(85 - L_A)/3}$$

where, L_A = A-weighted sound level

** Exposures of more than 12 hours should be followed by periods of equal length in quiet (less than 72dBA)

If exposures to two or more levels occur in one day, their combined effect should not exceed an 8-hour equivalent continuous level, Leq, 480min, of 85 dB, given by the equation:

$$L_{eq,T} = 10 \log \left[\frac{1}{T} \sum_{i=1}^{n} t_i \, 10^{0.1 L_i} \right]$$

where:

$L_{eq,T}$ = equivalent sound level for the time period T (T = 480 for 8 hr)

L_i = sound level of each noise source above 80 dB(A)

t_i = exposure period (minutes) for each noise source

T = total time period (minutes; 480 for 8 hr equivalent)

n = number of sources

This is equivalent to summing the fractions of the actual time of exposure to the allowable time of exposure. If this value exceeds one (1), the combined exposure should then be considered to exceed the standard. This may also be expressed mathematically as:

$$\frac{C1}{T1} + \frac{C2}{T2} + \frac{C3}{T3} + \ldots + \frac{Cn}{Tn} > 1$$

The C values are the actual exposure times to a given level; the T values are the times allowed at those levels by Table 3.2. All occupational noise exposures above the threshold level of 80 dBA shall be used in the above equations. (OSHA 29 CFR 1910.95)

For work shifts other than 8-hour periods, the measured average noise exposure should be adjusted to an 8-hour equivalent exposure level using:

$$L_{eq,8hr} = L_{eq,T} + 10 \log (T/8)$$

where:

$L_{eq,8hr}$ = equivalent sound level for an 8-hour period

$L_{eq,T}$ = measured sound level for the period T

T = length of the work shift in hours

3.1.3. Impulse or Impact Exposures. Unprotected personnel shall not be exposed to impulse or impact noise exceeding 140 dB peak sound pressure level. **Attachment 2** contains detailed information applicable to this limit, as well as levels produced by certain weapons.

3.1.4. Hazardous Noise Areas. A hazardous noise area with any exposure at or above 85 dBA shall be clearly identified by signs located at entrances to, or the borders of, the area. Signs should be designed according to the guidelines in DoDI 6055.12, section 6.4, and will have the following message:

CAUTION

HAZARDOUS NOISE AREA

HEARING PROTECTION REQUIRED

AF Visual Aid (AFVA) 48-101 may be used for this purpose. Such wording as "When machines are operating" or "Within 25 feet of operating band saw" may be added at the bottom of the caution sign to accurately identify the noise hazard area. Whenever such modifications are required, BE will specify the exact wording to be used. All personnel shall wear hearing protection in a hazardous noise area when hazardous noise sources are operating, regardless of exposure duration.

3.2. **Noise Exposure Limits-Whole Body Effects.**

3.2.1. At certain high sound pressure levels, exposed persons may suffer adverse effects which do not involve the hearing organs. Whole body limits are designed to prevent these effects.

3.2.2. No octave or one-third octave band level may exceed 145 dB for frequencies in the range of 1 Hz through 40 kHz, and the overall sound pressure level must be below 150 dB (unweighted). There are no time limits for exposures below these levels. However, protecting hearing requires adherence to the hearing protection limits in paragraph **3.1.** and the ultrasonic evaluation requirements in **3.2.3.** to protect against non-auditory effects of noise; this applies regardless of any hearing protection used.

3.2.3. The impact of workplace equipment or other workplace conditions causing ultrasonic noise exposures shall be evaluated. The limits specified in DoDI 6055.12 and the latest version of American Conference of Governmental Industrial Hygienist (ACGIH) Threshold Limit Values (TLV) for Chemical Substances and Physical Agents should be used. Note these limits are designed to protect hearing. They apply at the ear, and hearing protective devices can be used to meet these limits. Consultation with AFIOH/RSH may be required in measuring or evaluating ultrasonic noise.

3.2.4. Pregnant Workers. Fetal noise is a controversial topic with fairly limited research on which to base exposure guidelines for pregnant women. A few studies suggest noise is a potential hazard; however, these studies provide insufficient evidence to establish firm fetal noise protection guidelines. There is evidence to suggest that noise exposure in excess of a C-weighted, 8-hour $L_{eq,T}$ of 115 dBC or a peak exposure of 155 dBC to the abdomen of pregnant workers, beyond the fifth month of pregnancy, may cause hearing loss in the fetus. The worker's attending physician should work with BE to appropriately characterize the work environment and to recommend the sound

levels that should be avoided. BE should quantify specific exposures, as requested by the attending physician, if not previously quantified during routine or special surveillance.

3.2.4.1. Job rotation should be considered for pregnant workers who are exposed to hazardous noise after 20 weeks. Using job rotation for 20+ week pregnancies is highly recommended for workers having an ECL at or above 100 dB(A) unprotected exposure.

3.2.4.2. Working in impulse or impact noise environments requiring hearing protection (e.g. firing ranges, EOD detonations, etc.) should be avoided by pregnant workers.

3.3. **Music Exposure Criteria.** Exposure to recreational music may lead to hearing damage; two groups are typically affected: customers (recreational exposure) and the employees (occupational exposure).

3.3.1. Employees. For employees who have occupational exposure to music, the noise exposure limits and other provisions in this standard apply as for any other group of occupationally exposed employees.

3.3.2. Customers. Entertainment planners and customers need some understanding of the hazards associated with recreational exposure to loud music. Air Force occupational noise exposure standards cannot be directly applied to recreational exposures. Assuming customer exposure to loud music is generally limited to 2-hours, once per week, the music level should not exceed an equivalent continuous level, L_{eq}, of 94 dBA for any continuous 2-hour period at any customer location.

3.3.2.1. The manager of each facility or activity where recreational exposure to loud music may occur should post or issue precautionary warnings. BE personnel may provide technical assistance in initial monitoring, interpreting results, and recommending controls.

3.3.2.2. 94 dBA is a guideline and does not constitute a never to be exceeded sound level. The intent is to allow music to be entertaining within reasonable and safe limits.

3.4. **Noise Exposure Limits--Job Performance.** Noise exposure limits in this section are provided to maintain effective job performance. These limits should be used as design recommendations in the construction of new facilities or to address concerns and correct problems arising from present conditions that interfere with accomplishing current tasks or operations.

3.4.1. Quality of Person-to-Person Communication. The data shown at Table 3.3 provide ranges of sound levels and the corresponding routine communication capability for several situations. When evaluating speech interference near small arms areas, or other areas where hearing protection is worn, the attenuation of the hearing protection will be taken into account.

3.4.2. Office and Work Space. Noise measurements made for comparing noise in an office with these criteria should be done with the office in normal operation, but with no one talking at the location where speech communication is being evaluated. Background noise with the office unoccupied should be lower by 5 to 10 dBA. Acceptable levels are at Tables 3.4 and 3.5.

3.4.3. Group Meeting, Study, and Rest and Relaxation Areas. Noise measurements made to compare the noise environment in an area with these criteria should include internal and external background noise. Acceptable levels are at Table 3.6. *NOTE:* Expected voice represents the increase of voice level a speaker in a noisy field usually adopts. The communicating voice level is the voice level a speaker can produce over the range of sound levels shown when forced to communicate (achieve a 95 percent word score, with positive, instantaneous feedback).

Table 4. Quality of Person-to-Person Voice Communication*

Voice Levels				
Noise Level (dBA)	Normal Voice	Raised Voice	Shouting	Telephone Use
40 to 50	Satisfactory to 30 feet			Satisfactory
50 to 60	Satisfactory to 6 feet	Satisfactory		Satisfactory
60 to 70	Satisfactory to 3 feet	Satisfactory to 6 feet		Satisfactory to slightly difficult
70 to 80*	Satisfactory to 1 foot	Satisfactory to 3 feet		Slightly difficult
80* to 90		Satisfactory to 1 foot,	Slightly difficult	Difficult
90 to 95		Slightly difficult to 2 feet	Slightly difficult to 3 feet	Very Difficult
Above 95			Slightly difficult to 1 foot	Unsatisfactory

*Noise exposure limits may be exceeded by a combination of noise plus voice.

Table 5. Noise Levels for Offices*

Range of Levels (dBA)	Communication Environment
30 to 40	Very quiet office, telephone use satisfactory, suitable for large conferences.
40 to 45	Quiet office, satisfactory for conferences at a 15 foot table; telephone use satisfactory; normal voice 10 to 30 feet.
45 to 50	Satisfactory for conferences at a 6 to 8 foot table; telephone use satisfactory; normal voice 6 to 12 feet
50 to 60	Satisfactory for conference at 4 to 5 foot table; telephone use occasionally slightly difficult; normal voice 3 to 6 feet; raised voice 6 to 12 feet.
60 to 65	Unsatisfactory for conference of more than two or three people; telephone use slightly difficult; normal voice 1 to 2 feet; raised voice 3 to 6 feet.
Above 65	Very noisy; office environment unsatisfactory; telephone use difficult.

Table 6. Noise Levels for Work Spaces*

Range of Levels (dBA)	Communication Environment
70 to 80	Person-to-person communication with raised voice satisfactory 1 to 2 feet; slightly difficult 3 to 6 feet. Telephone use difficult.
80 to 90	Person-to-person communication slightly difficult with raised voice 1 to 2 feet; slightly difficult with shouting 3 to 6 feet. Telephone use very difficult.
Above 90	Person-to-person communication extremely difficult. Telephone use unsatisfactory.

Table 7. Noise Levels for Group Meetings, Study, Rest and Relaxation*

Range of Levels (dBA)	Type of Space and Activities
34 to 45	Group gatherings to listen to speech and music; low background noise and good hearing conditions required; sleeping.
45 to 55	Areas where some concentration and relaxed communication may be desirable; reading rooms, sedentary relaxation; radio and television listening.
55 to 65	Good communication conditions not essential; some distraction due to external noise can be permitted; internal noise generation due to other activities may be present.

* Based on recommendations outlined in ANSI S3.14-1977 (R1997), American National Standard for Rating Noise with Respect to Speech Interference.

3.5. **Frequency of Surveys.** Potential noise hazards shall be identified, evaluated, and controlled as an integral part of the surveys specified in AFPD 48-1, *Aerospace Medicine,* AFI 48-101, *Aerospace Medical Program,* and AFI 48-145*, Occupational Health Program.* Specifically, the health effects of noise shall be evaluated as part of routine and special surveillance, and when operations change or new operations start. Additionally, surveys are performed when specific requests address the potential for hazardous noise exposure or evaluation of other types of requests show there to be potential noise hazards (OSHA 29 CFR 1910.95).

3.5.1. An initial survey shall be conducted in all potentially hazardous noise areas. Work area/ shop supervisors will notify BE within 3 days of any change in operations that results in increased noise levels and BE will conduct a new noise evaluation within 30 days of this change IAW requirements of DoDI 6055.12.

3.5.2. Initial, representative $L_{eq,T}$ noise level data shall be collected for similar exposure groups (SEG) established IAW AFI 48-145, *Occupational Health Program* and AFMAN(I) 48-146, *Occupational Health Information Management,* for all AF employees (military and civilian) routinely working in hazardous noise areas; additional assessment will be accomplished within 30 days of any change in operations affecting noise levels. When the noise exposures for a particular SEG are highly variable or not clearly well above/below the PEL, $L_{eq,T}$ evaluations will be accomplished IAW AFI 48-145, *Air Force Occupational Health Program,* and AFMAN 48-146, *Occupational Health Information Management*, to adequately characterize the noise hazard.

3.6. **Noise Hazard Survey.** A generalized process sequence, coupled with specified evaluation procedures, will be instituted to ensure a uniform approach to noise hazard surveillance. The objective is to determine whether or not noise exposures pose a significant risk to the workers' hearing. There are four phases to the surveillance process: anticipation, recognition, evaluation, and control.

3.6.1. Anticipation**.** BE shall assume all potential high noise sources represent a potential occupational exposure to hazardous noise.

3.6.2. Recognition. The BEE shall become familiar with the processes being performed in the workplace through firsthand observation, interviews with shop personnel, review of existing surveillance data, epidemiological summaries completed by PH, and health record review notes. Potentially hazardous noise sources should be noted during this phase to identify the need for further consideration in the evaluation phase.

3.6.3. Evaluation**.** Three types of noise surveys are conducted to evaluate the noise environment: the noise source survey, the worker exposure survey, and the hazardous noise area survey. Data collection shall be conducted when new processes are identified or existing data is no longer current. Measurements shall be made using equipment conforming to the appropriate ANSI standard in the references. All noise data used to characterize occupational exposures shall be entered into the current AF approved OEH-MIS. Only qualified personnel who are approved by a fully qualified BEE shall conduct noise surveys. Qualification will be determined either by an assessment of formal education/training or by application of professional judgment.

3.6.3.1. Noise Source Survey. This survey is used to classify whether a particular noise source output exceeds the criterion level of 85 dBA and could present a potential exposure hazard to workers. Sound level measurements shall be made using A-weighting with slow response. If the source is determined to be potentially hazardous and engineering controls are to be considered, an octave band analysis may be necessary; BE will determine the appropriateness of accomplishing octave band analysis. Historical data should be applied to sources of hazardous noise that have previously been well characterized, e.g., a generator for which the sound pressure levels have been adequately assessed. Hazardous noise sources will be labeled where possible with an AFVA 48-101, 48-103, 48-104, and/or 48-105 to warn operators of the need to wear hearing protection.

3.6.3.2. Worker Exposure Survey. Where the potential to exceed the limits in paragraph **3.1.** exists, worker exposures shall be evaluated by direct measurements with noise dosimeters, or indirectly with noise exposure calculations (**3.1.2.**).

3.6.3.2.1. TWA noise levels shall be determined for all AF workers routinely working in hazardous noise areas at least once and within 30 days of any change in operations affecting noise levels IAW DoDI 6055.12.

3.6.3.2.2. In circumstances such as high worker mobility, significant variations in noise levels, or a significant component of impulse noise, representative personnel sampling shall be conducted. AFIOH/RSH can be contacted for impulse noise monitoring.

3.6.3.2.3. When multiple worker days are used to determine the average daily equivalent continuous level (ECL) for an individual or group of individuals, the ECL can be used when formulating surveillance plans and shall be calculated according to the formula:

$$ECL = 10 \log \left[\frac{1}{n} \sum_{i=1}^{n} 10^{0.1 L_{eq.Di}} \right]$$

where:

ECL = average daily equivalent continuous sound level

$L_{eq,Di}$ = daily equivalent continuous sound level

n = number of work days monitored.

3.6.3.2.4. Dosimeter Readings as a Dose. The following equation can be used to convert a dosimeter reading as a percent of the daily dose to the daily equivalent sound level.

$$ECL = 10 \log \left[\frac{8}{T} * \frac{D}{100} \right] + 85$$

where:

ECL = average daily equivalent continuous sound level

T = time dosimeter was operated (hours)

D = dosimeter reading (dose percent)

3.6.3.2.5. Worker noise exposure shall be computed and reported regardless of any attenuation provided by hearing protectors. However, workers should understand how hearing protection devices affect their exposure levels.

3.6.3.2.6. The decision to place an individual on the HCP will be based on the likelihood of routine exposure exceeding 85 dBA as an 8-hour TWA. The following conditions should be considered when estimating exposure for an individual or group of individuals assigned to a Similar Exposure Group. These conditions are based on assumption of no routine exposure to hazardous noise in these environments:

- Number of days spent in classroom training
- Number of days spent in administrative tasks, medical appointments other duties, etc.
- Number of days detailed to wing support not related to primary duty
- Number of days at formal training or temporary duty

3.6.3.3. Hazardous Noise Area Survey. These surveys are used to define work areas where noise exposures are assumed hazardous based on routine operations. Hearing protection requirements for these areas should be made clear to all personnel that might enter these areas. These surveys can be used to define a work area enclosed by clear borders as a hazardous noise area or to identify a hazardous noise zone around a certain piece of equipment. When marking a hazardous noise zone around a piece of equipment, careful consideration must be given to noise production variables and the equipment's mobility.

3.6.3.4. Instrumentation used for these surveys must meet or exceed requirements for type 2 sound level meter as identified in ANSI Standard S1.4-1983 and its most recent revision. Instruments must have been subjected to a complete electro-acoustic calibration no more than 1 year before the survey. Acoustical calibration must be performed on the instruments before and after each day's measurements. The acoustical calibrator must be accurate to within plus or minus one dB, and must have been subjected to a complete electro-acoustic calibration no more than 1 year before the survey.

3.6.3.5. When personal noise dosimeters are used for worker exposure measurements, they must integrate all sound levels from 80 dB to 130 dB. Dosimeters must meet or exceed specifications in the latest approved ANSI Standard S1.25, *Specification for Personal Noise Dosimeters*. AF components shall use a time-intensity exchange rate of 3 dB.

3.6.4. A risk assessment code (RAC) shall be assigned to all potentially hazardous noise areas and operations, in accordance with DoD Instruction 6055.1.

3.6.5. A current inventory of all potentially hazardous noise areas and operations shall be maintained to include, minimally, noise levels, RACs, and the types of control measures used.

3.6.6. Secure/Classified Area. Noise dosimeters are authorized for use in Sensitive Compartmented Information Facilities (SCIFs), but local clearance will be obtained in advance through the facility Sensitive Compartmented Information Security Officer.

4. PERSONNEL AND EQUIPMENT STANDARDS

Certification of Hearing Conservationists:

4.1. Personnel performing audiograms as part of the USAF HCP will be trained as Hearing Conservationists as established by the CAOHC. AF trained individuals may apply to CAOHC to receive Certification. CAOHC trained Hearing Conservationists, are not permitted to conduct audiometric testing outside of HCP requirements. It is recommended that AF personnel obtain CAOHC approved HC training at either USAFSAM or DoD component, as it includes training on the DOEHRS-HC software. Personnel who are CAOHC certified or receive training from a CAOHC approved civilian agency must contact the USAFSAM to receive an AF Certification number BEFORE performing audiometric testing. Personnel who are CAOHC trained by a DoD component will use the certification number issued by that Service.

4.2. AF Hearing Conservationists can perform the following activities:

- Audiometric testing.
- Visual exam/otoscope of the ear to rule out conditions that interfere with audiogram.
- Taking a medical history.

- Screening audiograms for review by the Occupational Health Consultant.
- Care of the audiometer and ensuring daily and annual calibration.
- Educating, training, and counseling noise exposed personnel.
- Selecting and fitting appropriate hearing protective devices.

4.3. CAOHC approved re-certification is required at 5-year intervals for individuals active in hearing conservation testing.

4.4. AF Hearing Conservationists who perform audiograms must be responsible to an audiologist, otolaryngologist, or other physician, IAW OSHA 29 CFR 1910.95, (g)(3).

4.5. AF Certified Hearing Conservationists are not trained to provide audiograms for diagnostic evaluations, school screenings, or hearing tests outside the scope of the AF HCP.

4.6. Audiometric Equipment Standards. Audiometric testing done in support of the HCP will be conducted with audiometers meeting the standards of ANSI S3.6-1996, *Specification for Audiometers* (or current ANSI standard). Audiometers must be DOEHRS HC compatible.

4.7. Standardized HCP Audiometers. Routine pure tone air conduction testing is to be accomplished with standardized HCP audiometers. DOEHRS-HC is the authorized system for use in the HCP, and provides input into the DOD-wide Occupational Health databases. Data from diagnostic clinical audiometers used by HCDC/HCC can be input manually. Questions concerning the DOEHRS-HC system should be directed to the Chief, Health and Safety Division, AFIOH.

4.8. Computer generated forms must be suitable for securing in the patient's health record.

4.9. Calibration and Testing**.** Hearing Conservationist will ensure all audiometers and sound rooms have been tested and calibrated before use in the HCP. The Biomedical Equipment Technician or equivalent will ensure all calibrations and certifications are performed according to ANSI S4.1-1983, *Specification for Sound Level Meters,* and ANSI S3.1-1999, *Criteria for Permissible Ambient Noise During Audiometric Testing for Ear Covered Test Conditions* (or current ANSI standard).

4.10. Daily Functional Check. A daily functional check is required before each day's use (see AFPAM 48-133*, Physical Examination Techniques*). The examiner should listen to all frequencies at various intensity levels. This general check of the machine and its function will include listening for:

- Crackling sounds or changes in loudness while moving the cord.
- The presence of tones at all frequency settings.
- Presence of tones only in the appropriate headphone.
- Periods of silence while listening to the frequency and attenuation changes.

4.11. Daily Calibration Check: Shall be performed every day that hearing tests are administered. An examiner who operates the audiometer must perform the calibration. The calibration test subject can be an electroacoustic ear or someone with known stable hearing levels, free of ENT problems, and not routinely exposed to hazardous noise. Record the daily calibration results on the DD Form 2217**, Biological Audiometer Calibration Check**.

4.12. If a change in threshold of more than plus or minus 5 dB at any frequency (except 6000 Hz), or more than plus or minus 10 dB at 6000 Hz occurs, repeat the calibration procedure. If the calibration standard is an electroacoustic ear, reset the headphones and repeat the procedure.

4.12.1. If the calibration test fails a second time, test a person with known stable hearing thresholds.

4.12.2. Out-of-calibration audiometers must not be used. They must be checked by Biomedical Medical Technicians and repaired or re-calibrated before being placed back in service.

4.13. Document all activities on the DD Form 2217. A new DD 2217 must be established when the audiometer is re-calibrated.

4.14. Annual Acoustic Calibration: Audiometers used in the HCP will be acoustically calibrated by Biomedical Equipment Technicians or appropriate provider of these services, annually, per 29 CFR 1910.95, Chapter XVII, Attachment E, *Acoustic Calibration of Audiometers*. The calibration date, taken from the hearing conservation forms, will be stored at the DOEHRS-DR for 30 years.

4.15. Exhaustive Calibration: Performed by Biomedical Equipment Technician every 2 years according to sections 4.1 through 4.5 of ANSI S3.6-1996, *Specification for Audiometers* (or current ANSI standard). Test frequencies below 500 Hz and above 6000 Hz may be omitted from this calibration for those audiometers used in the HCP.

4.16. Earphones. Only earphones meeting the requirements of ANSI Standard S3.6-1996, or current ANSI standard, will be used in the AF HCP. Earphones must ONLY be used with the audiometer they were calibrated. Insert earphones should not be used for HCDC/HCC evaluations as thresholds obtained are often different from those obtained with circumaural earphones. The audiologist should consider that since the annual testing is usually done with circumaural earphones the STS would likely be present again next year if insert earphones were used. If the STS is due to collapsing canals, it is recommended to prevent the collapse of the canal with circumaural earphones. If the STS has improved simply due to a better signal to noise ratio, the audiologist should verify the STS and recommend a re-established reference based on results that are realistically obtained in a normal HCP environment (e.g., consider using F/U #2 or a diagnostic audiogram done with circumaural earphones).

5. HEARING PROTECTION

5.1. The use of personal hearing protectors to limit noise exposure is an interim protective measure while engineering control measures are being explored. Such devices shall constitute a permanent measure only if the BE determines, in coordination with the workplace supervisor and the unit commander, that engineering controls are not technologically, economically, or operationally feasible.

5.2. Personal hearing protectors are provided at no cost to all AF personnel who work in designated hazardous noise areas or operate noise-hazardous equipment. The worker's organization shall pay for the personal hearing protectors (including custom molded hearing protection).

5.3. The hearing protectors provided must be capable of attenuating worker noise exposure below a TWA of 85 dBA. If hearing protectors do not provide sufficient attenuation, further control of exposure shall be necessary.

5.4. BE must approve HPDs for local use including local purchase items and HPDs for special applications. BE will verify the special need and ensure the device provides appropriate attenuation (see para. **5.13.**). Installation BE will notify MAJCOM BE and AFIOH/RSH if they have a special need. AFIOH/RSH will consolidate special needs and determine if an evaluation of a particular device is needed. If so, it will make a recommendation to the Air Staff to fund a project to conduct additional testing.

5.5. Noise muffs with built-in radios designed for recreational listening will not be used with or as protectors. Hearing aids are not hearing protectors. Certain hearing aids may be used with over-the-ear hearing protectors after evaluation and approval by an audiologist or otolaryngologist. If approved, the worker should be placed on a close scrutiny evaluation to determine STS after occupational noise exposure.

5.6. An earplug carrying case should be available, at no cost, for each set of pre-formed earplugs. This case can also be used for hand-formed earplugs.

5.7. At-the-ear exposure is calculated by BE. BE will provide PH with a copy of the Certified Protective Equipment List which includes HPDs approved for SEG use, attenuation and for each workplace process, as described in this standard. Ear level exposure is recommended to be between 76 to 84 dBA/ 8 hour exposure. NOTE: Care must be taken to avoid over protection. Excessive attenuation may cause the worker distress resulting in non-compliance with wear of the HPDs.

5.8. At the time of the annual audiogram Public Health should ensure personnel are fit with earplugs certified for use by BE. If a worker cannot be adequately fit with the earplugs recommended by the BE, PH or an audiologist will determine an action plan that ensures the worker is adequately protected from occupational hazardous noise.

5.9. PH shall maintain a variety of earplugs and carrying cases. Individual units must purchase earmuffs, disposable plugs, and other hearing protection variations approved by BE, necessary to fully protect workers against hazardous noise.

5.10. Active Noise Reduction (ANR) hearing protection is not appropriate for all industrial/military environments. Before employing ANR hearing protection, contact AFIOH/RSH, to assist in determining the appropriateness and feasibility of ANR applications.

5.11. Communication headsets are appropriate in some environments. Contact the Health and Safety Division of AFIOH to assist in determining the appropriateness and feasibility of these applications.

5.12. Types of Hearing Protective Devices (HPD):

5.12.1. Insert Type Ear Plug. An insert earplug is designed to provide a seal with the ear canal. There are three types of insert ear plugs: premolded, formable, and custom ear plugs.

5.12.1.1. Premolded Ear Plugs. Premolded earplugs are pliable devices of fixed proportions. Personnel fitting and dispensing earplugs will train users on proper insertion, wear, and hygiene. They are reusable, but may deteriorate and need replacement. (**Attachment 6**)

5.12.1.2. Formable Ear Plugs. Formable earplugs come in one size. Some are made of material that after compression and insertion, expands to form a seal in the ear canal. When properly inserted, they provide noise attenuation values that are similar to those from correctly fitted premolded earplugs. Formable earplugs are usually considered disposable, and therefore are more expensive for long-term routine use. Individual units may procure approved formable earplugs. Each earplug must be held in place while it expands enough to remain firmly seated. These earplugs may be washed and reused, but should be replaced after 5 uses or when they no longer form an airtight seal when properly inserted. (See **Attachment 7**)

5.12.1.3. Custom Molded Ear Plugs. A small percentage of the AF population cannot be fitted with standard premolded or formable earplugs. Custom earplugs are made to fit the exact size and shape of the individual's ear canal. Individuals needing custom earplugs will be referred to

Public Health or the HCPM. AF Band members are the only personnel authorized to obtain custom made musician's earplugs (consult an audiologist).

5.12.2. Earmuffs. Earmuffs are devices worn around the ear (circumaural) to reduce the noise reaching the ear. Their effectiveness depends on a tight seal between the cushion and head. (See **Attachment 8**)

5.12.3. Communication Earmuffs (Electroacoustic Devices). Personnel who must communicate in the presence of intense noise use these devices. They are fitted with earphones and, if needed, a noise-shielding microphone so voice communications can be achieved during various operations. Noise exposure limits may be exceeded by the combination of external noise plus voice.

5.12.4. Combination Communications Earmuff and Earplug. When extremely high noise levels are present, and attenuation of communication earmuffs does not allow enough exposure time to complete the mission, earplugs can be worn in addition to the earmuffs. Custom molded earplugs can be made under the supervision of an audiologist. This combination of protection should provide a longer exposure time for mission completion. Information on modifications of earmuffs and fabrication of custom molded ear plugs can be obtained from AFIOH/RSH.

5.12.5. Flight Helmets. Flight helmets used during ground or airborne operations provide varying degrees of protection from noise. The ear enclosures in these devices determine the degree of protection achieved. Generally, the amount of protection provided, primarily at frequencies below 1000 Hz, varies with the condition of the ear enclosures and the acoustic seal. Headset ear enclosures and ear cushions must be maintained in good repair.

5.13. Limits of Hearing Protection Performance:

5.13.1. The maximum possible sound attenuation provided by HPDs is limited by human body and bone conduction mechanisms. Even though a particular device may provide outstanding values of noise attenuation, the actual noise reduction may be less because the noise surrounding the head and body bypasses the hearing protector and is transmitted through tissue and bone pathways to the inner ear.

5.13.2. The term "double hearing protection" for earplug and earmuff combinations is misleading. The attenuation provided from earplug and earmuff combination wear will be less than the sum of their individual attenuation values. Never add individual HPD attenuation values to derive a combination value. Add 3 dB to the highest NRR of the plug or muff to estimate combined protective rating if actual attenuation data for the combination is not available.

5.13.3. Estimating Noise Attenuation for HPD.

5.13.3.1. The noise attenuation provided by HPDs varies between wearers, even when the wearers are highly skilled at fitting the HPDs to their ears. Noise attenuation data reported by manufacturers are given as a mean and standard deviation attenuation for a highly trained human test panel. Attenuation values for HPDs use the reported mean minus two standard deviations. Testing method ANSI S12.6-1997 is referenced. Consult with the device manufacturer for specific attenuation data. Also the National Institute of Occupational Safety and Health (NIOSH) maintains a database and website with HPD attenuation values and procedures on how to calculate at-the-ear sound levels.

5.13.3.2. Octave Band Calculations. The preferred method to calculate HPD noise attenuation when the 8 hour TWA exceeds 94 dBA involves calculating attenuated sound levels at each

octave band. Subtract two standard deviations from the manufacturer's mean attenuation values for at-the-ear noise level calculation. The estimated at-the-ear sound levels at each octave band are then compared to the A-weighting scale, and added logarithmically for the total A-weighted sound pressure level.

5.13.3.3. Noise Reduction Rating (NRR). The preferred method of estimating HPD noise attenuation when the 8 hour TWA is less than 94 dBA is by using the NRR. The NRR assumes equal noise levels in each octave band. Subtract 7dB from the NRR and subtract the adjusted NRR from the A-weighted sound pressure level for the noise source to determine the at-the-ear A-weighted sound pressure level.

5.14. Fitting and Dispensing Earplugs:

5.14.1. PH will accomplish initial earplug fitting. PH will fit and dispense pre-formed earplugs and/or foam plugs at the time of the audiometric evaluation.

5.14.2. Each ear will be individually fit with earplugs (approximately 20 percent of the population requires a different sized earplug for each ear).

5.14.3. Workers unable to be properly fit with pre-molded or foam HPD should be referred to the HCDC/HCC or a certified civilian audiologist for custom made earplugs at AF expense.

5.14.4. Custom made devices may be appropriate for special circumstances. Service band members should be provided with pre-molded or custom molded musician's earplugs. Only audiologists, otolaryngologists or trained technicians may make impressions of the ear canals required for fabrication of specialized earplugs.

5.14.5. Workers may be fitted with pre-formed earplugs at the expense of the AF, but if workers request custom made devices as a personal preference, the unit is not obligated to pay for any additional examinations and the fabrication of specialized plugs.

5.14.6. PH will examine the fit and condition of all HPD during annual audiograms, and whenever an effectiveness question exists (DoDI 6055.12 (6)(1)). The worker should demonstrate proper fitting technique at the time of the audiogram.

5.14.7. PH trains personnel on the proper use and care of HPD at the time of audiometric testing. Personnel requiring earmuffs (in addition to earplugs) will be informed of this requirement and educated on the importance of using adequate protection

5.14.8. Supervisors instruct users on proper use and care of HPDs in the workplace as part of the annual training program.

5.15. Cleaning and Maintenance

5.15.1. Reusable earplugs or formable devices should be washed in lukewarm water with hand soap, rinsed in clean water, and dried thoroughly. Wet or damp earplugs should not be worn or placed in their containers. Cleaning should be done as needed.

5.15.2. Earmuff seals should be kept clean. The plastic or foam cushions may be cleaned in the same way as earplugs, but the inside of the muff should not get wet. When not in use, earmuffs should be placed in open air to allow moisture that may have been absorbed into the cups to evaporate. Earmuff seals should be replaced as needed.

5.15.3. Anyone experiencing difficulty in wearing hearing protection (i.e. irritation of the ear canal(s) or pain) should immediately report this to their supervisor. The supervisor should remove the worker from exposure to hazardous noise and contact their Primary Care Manager (PCM) or PH.

6. NOISE CONTROL

6.1. **Hierarchy of Controls.** Engineering controls are the first choice to reduce hazardous noise exposures. Due to cost and design limitations associated with some engineering control solutions, administrative controls and/or the use of personal protective equipment may be necessary.

6.2. **Engineering Procedures.** Noise limit recommendations should be included as part of the acquisition process. If the required equipment is not available within specified noise output limits, alternate methods of noise control may be necessary. This may also be the case when noise levels associated with existing equipment cannot be controlled cost effectively through engineering solutions. Examples of engineering controls are provided below:

6.2.1. Sound Absorbent Materials. Equipment with moving parts such as gears and cams can generate significant noise levels, especially in confined areas where noise can reflect and build-up. Sound absorbent materials can help reduce noise levels in the immediate area and in adjoining areas. Specific applications involving the type, amount, configuration, and placement of sound absorbent materials need to be determined based on an engineering evaluation.

6.2.2. Noise Barriers/Enclosures. The use of barriers and enclosures may be effective to reduce noise levels depending on the characteristics of the noise source, the configuration and materials used for the noise barrier/enclosure, and the acoustics on both sides of the barrier/enclosure. Noise reduction from barriers/enclosures may vary considerably based on the construction layers and surface areas. Higher values of control may be expected from multi-layer barriers with greater surface areas. Well-designed partial barriers may provide more noise reduction than a single wall barrier.

7. FITNESS AND RISK EVALUATIONS:

7.1. Personnel who cannot perform essential job functions, and/or pose a safety risk to themselves or others, because of a medical condition, will be evaluated for fitness and risk. The fitness and risk evaluation may be requested by the medical provider or by line management. Personnel should be considered for a fitness and risk evaluation when they:

- Show a second PTS in the same ear
- Exceed the H-1 profile on pre-placement audiogram and enter a noise hazardous area
- Complain of not hearing/understanding spoken communications, auditory cues or signals
- Exhibit behavior resulting in invalid or unreliable audiograms (Failure to obtain accurate audiometric test data should result in a worker being removed from all hazardous noise environments due to an inability to accurately monitor hearing)
- Exhibit behaviors that call into direct question the ability to work in the assigned job
- Cannot be fit with standard HPDs.

7.2. Flying personnel who meet the criteria above or exceed hearing standards for their flying class will be evaluated as directed in AFI 48-123*, Medical Examinations and Standards*.

7.3. For non-flying personnel, provider initiates the Fitness and Risk Evaluation in coordination with the HCPM. The provider must address in the Reason(s) For Request: clinical status and job safety. The practitioner may include a job capability assessment in the informed medical recommendation.

7.4. Provider will perform a clinical examination. As a minimum, the routine clinical exam (AF Form 1753-Section II) will be performed. If other medical conditions impact the person's ability to perform the job capably or safely, they will be addressed in the clinical examination.

7.5. Clinical evaluation by either HCDC/HCC, or a licensed or certified civilian audiologist is required as a part of the fitness and risk evaluation when a worker has:

- A second PTS in the same ear;
- Suspected conductive pathology; or
- Invalid or unreliable audiometric test results.

7.6. The Job Capability and Fitness Survey:

7.6.1. Base Personnel Flight must prepare a list, using the AF Form 1754, Part 2, of the minimum essential tasks and auditory requirements a worker must have for job qualification.

7.6.2. HCPM completes the Job Capability Survey, using the AF Form 1754, Part 3. HCPM interviews the worker, visits the workplace, and for each task identified by the appointing official makes a judgment if the worker will be able to capably perform the task.

7.6.3. When requested by the medical provider, safety officials and the shop supervisor will analyze job safety, complete AF Form 1754, Part 4, and return the form to the medical provider. The Job Capability Survey (Part 3 - Medical) and the Job Safety Analysis (Part 4 – Safety) should be performed at the same time.

7.6.3.1. The safety representative, with assistance from the shop supervisor, performs the safety analysis using the AF Form 1754, Part 4. Safety officials interview the worker, visit the workplace, and, for each task identified by the appointing official, make a judgment as to whether the worker will be able to perform the task without endangering themselves or others.

7.6.3.2. The safety analysis should address, but is not limited to, the following conditions:

- Does the worker perform tasks alone or in-groups?
- If group tasks are required, are visual cues available?
- Does the worker need to communicate to perform tasks?
- Do potential hazard signals exist that the worker needs to hear (forklifts, special machinery, announcements, etc.)?
- Do the job tasks include confined space entry?

7.7. Medical Determinations and Recommendations**:**

7.7.1. The medical provider will only make a recommendation whether the worker will be able to capably perform the task. The appointing official/commander makes the final decision.

7.7.2. To assist managers in making employment and placement decisions, medical recommendations will be one of the following:

7.7.2.1. Worker meets medical requirements of the position.

7.7.2.2. Worker meets medical requirements with an accommodation or restriction. (List recommended accommodations or restrictions and the expected therapeutic or risk avoiding benefit considering operational risk management decision-making process).

7.7.2.3. Worker is not fit to perform essential tasks, will pose an undue risk to themselves or others, or fails to meet medical requirements for the job. The medical provider must include reasonable justification for recommendations.

7.7.3. A determination of hearing profile might also be necessary (per AFI 48-123). AF Form 422, **Physical Profile Serial Report,** and H-1 profile designation are not appropriate for civilian employees. Hearing profiles are not appropriate for decisions concerning disposition and/or disqualification. Individual worker determinations are made on a case-by-case basis as outlined by the Fitness for Duty Evaluation.

7.7.4. The provider may assume a worker meets the minimum medical qualifications to perform a job in a hazardous noise environment if one of the following conditions is true:

7.7.4.1. Worker has an H-1 profile, can wear standard HPDs, and does not report difficulty hearing and understanding routine spoken communications, auditory cues, or signals.

7.7.4.2. Worker has undergone a previous fitness and risk evaluation, hearing thresholds have not changed significantly (no STS compared to most current reference), medical condition that might impact job performance in a hazardous noise job has remained stable; and the worker's supervisor has not expressed any new concerns.

7.7.5. The medical recommendation for placement or continuation in a noise-hazardous job will include the following statement on the AF Form 422 or locally derived return to duty memo, "This worker meets medical standards to work as a [*insert job title and occupation code*] in [*insert shop name and number*]". If restrictions or accommodations are recommended, they should be listed on AF Form 422, or locally derived return to duty memo, along with the expected risk-reducing or therapeutic benefit.

7.7.6. A disqualifying medical determination is warranted if:

7.7.6.1. A medical condition prevents the worker from performing the essential functions of the job and no reasonable accommodation would enable the worker to perform the job.

7.7.6.2. Allowing the worker to perform the job would endanger their safety, the safety of other workers, or the public.

7.7.6.3. The worker fails to meet a valid medical standard or physical requirement for placement in the position.

7.7.6.4. The worker determined to be medically disqualified because of reasons above must be individually evaluated.

7.7.7. A summary of the Fitness and Risk Evaluation will be prepared, using an AF Form 422, or locally derived return to duty memo, by the provider and will contain the following minimum information:

7.7.7.1. Reason for the Fitness and Risk Evaluation.

7.7.7.2. Clinical status (determination of whether a medical condition is temporary or permanent, and has reached maximum medical benefit).

7.7.7.3. Safety assessment results.

7.7.7.4. Recommendations for accommodations and (or) restrictions in the particular job.

7.7.8. The completed AF Form 1754, will be forwarded to PH for filing in the medical record.

7.7.9. Referral to an HCDC/HCC audiologist or licensed civilian audiology consultant is optional. However, if there is a need for audiologic consultation, a referral is appropriate.

8. FORMS PRESCRIBED: This AFOSH standard prescribes the use of the following forms:

AF Form 1489, **Audiological Evaluation Results**

AF Form 1672, **Hearing Conservation Diagnostic/Center Referral**

AF Form 1753, **Hearing Conservation Examination**

AF Form 1754, **Job Capability and Safety Analysis**

9. FORMS ADOPTED: This AFOSH standard adopts the use of the following forms.

AF Form 55, **Employee Safety and Health Record**

AF Form 422, **Physical Profile Serial Report**

GEORGE PEACH TAYLOR, JR. ,
Lieutenant General, USAF, MC, CFS
Surgeon General

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

Air Force Instruction (AFI) 41-115, *Authorized Health Care and Health Care Benefits in the Military Health Services Systems (MHSS).*

AFI 48-101, *Aerospace Medical Operations.*

AFI 48-123, *Medical Examination and Standards.*

AFI 48-145*, Occupational Health Program*

AFI 91-202, *The USAF Mishap Prevention Program.*

AFI 91-215*, Operational Risk Management*

AFI 91-301*, Air Force Occupational Safety, Fire Prevention, and Health (AFOSH) Program*

AFI 91-302, *Air Force Occupational Safety and Health Standards*

AFOSH 91-501*, Air Force Consolidated Occupational Safety Standard*

Air Force Policy Directive (AFPD) 48-1*, The Aerospace Medicine Program*

Air Force Manual (AFMAN) 36-2105, *Officer Classification*

AFMAN 36-2108, *Enlisted Classification.*

AFMAN 36-2622 V1, *Personnel Data End User's Manual.*

Air Force Pamphlet (AFPAM) 48-133, *Physical Examination Techniques.*

American Conference of Governmental Industrial Hygienists (ACGIH*) TLVs and BEIs, Based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices, Latest Edition.*

ANSI Standard S1.4A. *Specification for Sound Level Meters.*

ANSI Standard S1.11-1993, *Specifications for Octave-Band and Fractional Octave-Band Analog and Digital Filters,* current edition

ANSI Standard S1.25, *Specifications for Personal Noise Dosimeters*

ANSI Standard S3.19-1974, *American National Standard Method for the Measurement of Real-Ear Protection of Hearing Protectors and Physical Attenuation of Ear Muffs*.

ANSI Standard S3.1-1999, *Criteria for Permissible Ambient Noise During Audiometric Testing.*

ANSI Standard S3.6-1996, *Specification for Audiometers.*

ANSI Standard S4.1-1983, *Specification for Sound Level Meters.*

ANSI S3.14-1977 (R1997), *American National Standard for Rating Noise with Respect to Speech Interference*

ANSI Standard S12.6-1997, *Methods for Measuring the Real-Ear Attenuation of Hearing Protection.*

ANSI Standard S4.1-1983, *Specification for Sound Level Meters*.

ANSI Standard Z24.22-1957*, Standard Method for the Measurement of the Real-Ear Attenuation of Ear Protectors at Threshold.*

Department of Defense Instruction (DODI) 6055.12, *DoD Hearing Conservation Program*

DoD Instruction 6055.1, *DoD Occupational Safety and Health (SOH) Program*

Environmental Protection Agency (EPA) *Report 550/9-74-004, Information on Levels of Environmental Noise Requisite to protect Public Health and welfare with an Adequate Margin of Safety.*

International Standards Organization (ISO) 1999.2, *Acoustics- Determination of Occupational Noise Exposure and Estimation of Noise Induced Impairment.*

Military Standard (MIL-STD)-1474B(MI), *Noise Limits for Army Materiel*

Military Standard (MIL-STD)-1474D, *DoD Design Criteria Standard-Noise Limits,* 12 February 1997.

Military Standard (MIL-STD)-1789(USAF), *Sound Pressure Levels in Aircraft.*

Military Standard- 882C-2*, System Safety Program Requirements*

Title 29, Code of Federal Regulations, Section 1904.10, Recording Criteria for Cases Involving Occupational Hearing Loss, current edition.

Title 29, Code of Federal Regulations, Section 1910.95, Occupational Noise Exposure*,* current edition

Title 29, Code of Federal Regulations, Subpart 1910.145, Specifications for Accident Prevention Signs and Tags, current edition

Title 10, United States Code*,* Section 8013

Title 5, Code of Federal Regulations, Part 339, Medical Qualification Determinations, current edition.

Title 42, United States Code, Section 4914, Development of Low-Noise-Emission Products, current edition.

DoD Instruction 6055.5, *Industrial Hygiene and Occupational Health*, May 6, 1969

DoD Directive 8910.1, Management and Control of Information Requirements, June 11, 1993

Abbreviations and Acronyms

ACGIH—American Conference of Governmental Industrial Hygienists

AETC—Air Education and Training Command

AFI—Air Force instruction

AFIOH—Air Force Institute for Operational Health

AFMAN—Air Force manual

AFMC—Air Force Materiel Command

AFMOA—Air Force Medical Operations Agency

AFOSH—Air Force Occupational Safety, Fire Prevention, and Health

AFPAM—Air Force pamphlet

AFPD—Air Force policy directive

AFPC—Air Force Personnel Center

AFRC—Air Force Reserve Command

AFRL—Air Force Research Laboratory

AFSC—Air Force Safety Center

AFVA—Air Force Visual Aid

AIHA—American Industrial Hygiene Association

ANG—Air National Guard

ANR—active noise reduction

ANSI—American National Standards Institute

ARC—Air Reserve Component

BE—Bioenvironmental engineering

BEE—Bioenvironmental Engineer

BEI®—biological exposure indices from ACGIH

CAOHC—Council for Accreditation of Occupational Hearing Conservation

CFR—code of federal regulations

dB—decibel

dBA—decibels A-weighted (also written as dBA)

dBP—decibels peak

DLA—Defense Logistics Agency

DoD—Department of Defense

DoDI—Department of Defense instruction

DOEHRS-DR—Defense Occupational Environmental Health Readiness System–Data Repository

DOEHRS-HC—Defense Occupational Environmental Health Readiness System–Hearing Conservation

DR—data registry

DRU—direct reporting unit

ECL—equivalent continuous exposure level

EPA—Environmental Protection Agency

ENT—ear, nose, and throat, usually refers to an otolaryngologist

ESOH—environment, safety and occupational health

ESOH-MIS—Environment, Safety and Occupational Health Management Information System

FM—flight medicine

FOA—field operating agency

HC—Hearing Conservation

HCC—hearing conservation center

HCDC—hearing conservation diagnostic center

HCDR—Hearing Conservation Data Registry

HPD—hearing protection device

HCP—Hearing Conservation Program

HCPM—Hearing Conservation Program Manager

HTL—hearing threshold level

HQ—headquarters

Hz—hertz

ISO—International Standards Organization

MAJCOM—major command

MEPS—Military Entrance and Processing Station

MERC—medical equipment repair center

MIL-STD—military standard

MHSS—Military Health Services Systems

MTF—medical treatment facilities

NAF—non-appropriated funds

NFA—noise-free audiogram

NIOSH—National Institute for Occupational Safety and Health

NSN—national stock number

NRR—noise reduction rating

OEHED—Occupational and Environmental Health Exposure Data

OHC—occupational hearing conservationist

OHWG—Occupational Health Working Group

ORM—Operational Risk Management

OSHA—Occupational Safety and Health Administration

OWCP—Department of Labor Office of Workers' Compensation Program

PCA—permanent change of assignment

PCM—primary care manager

PCS—permanent change of station

PDO—publishing distribution office

PEL—permissible exposure limits

PESHE—Programmatic Environmental Safety and Health Evaluations

PH—public health

POC—point of contact

PPE—personal protective equipment

PPIP—Put Prevention Into Practice Program

PTA—pure tone average

PTS—permanent threshold shift

RAC—risk assessment code

RDT&E—research, development, test, and evaluation

RMU—reserve medical unit

SCIF—sensitive compartmented information facilities

SEG—similar exposure groups

SEGO—Operational Safety

SG—Surgeon General

SGOP—Chief, Aerospace Operations

SGP—Aerospace Operations Division

SIL—speech interference level

SLM—sound level meters

SPL—sound pressure level

SRT—speech reception threshold

STS—standard threshold shift (As defined by OSHA) or significant threshold shift

TLV®—threshold limit values from ACGIH

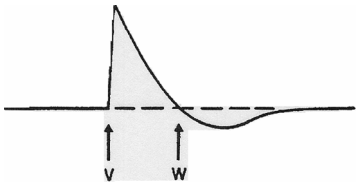
TTS—temporary threshold shift

TWA—time-weighted average

USAFSAM—United States Air Force School of Aerospace Medicine

Terms

A-Duration (Pressure Wave Duration)—The time required for the pressure to rise to its principle peak and return momentarily to ambient pressure. In the below sound pressure diagram, the A-duration is the duration from point V to point W.



Air Force Certified Hearing Conservationists—Personnel that are trained IAW the Council for Accreditation in Occupational Hearing Conservation and perform audiometric testing in support of the Air Force's Hearing Conservation Program.

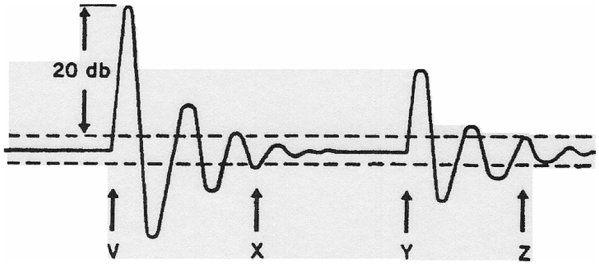
Annual Audiogram—An audiogram performed at least annually (also called periodic audiogram).

Appointing Official—Personnel officer or official authority to make management decisions concerning hiring, placement, accommodation, and termination of employees.

Audiogram—The measurement of a worker's hearing sensitivity expressed in decibels as a function of frequency. Data are reported in graphic or numeric form.

Audiologist—A clinician, researcher, or consultant, specializing in the preservation, evaluation, and rehabilitation of hearing.

B-Duration (Pressure Envelope Duration)—The duration of the primary portion of an impulse noise, plus the duration of significant subsequent fluctuations. These durations are considered to be the time interval during which the envelope of pressure fluctuations (positive and negative) is within 20 dB of the principal peak pressure level. Significant subsequent fluctuations are those whose summed duration is greater than 10 percent of the primary portion. The primary portion is the period of time which is followed by a level which remains 20 dB below the peak pressure level for a. significant duration. In the sound pressure diagram below, the B-duration would be from point V to point X plus point Y to point Z.



Close Scrutiny Audiogram—Frequently administered audiograms used to closely monitor a worker or group. When, on whom, and how often to perform close scrutiny exams is determined by the examining practitioner, or as directed by the OHWG.

Criterion Level—The sound level allowed for an 8 hour exposure, used as the basis for measurement of a noise standard. For the Air Force the criterion level is 85 dBA.

Defense Occupational Environmental Health Readiness System-HC—An automated audiometric system used by the military services for hearing conservation purposes.

Environment, Safety and Occupational Health Management Information System— The AF's overarching management system that incorporates environmental, safety, and occupational health information systems including but not limited to: Command Core System, DOEHRS-Industrial Hygiene, and the Automated Civil Engineering System-Environmental Management (ACES-EM).

Defense Occupational and Environmental Health Readiness System-DR—DOEHRS-HC data collection, retrieval and reporting site; used to submit, retrieve, and report DOEHRS-HC data; location for downloading updated DOEHRS-HC lookup tables.

Examining Practitioner—A credentialed health care provider (physician, nurse practitioner, physician assistant or audiologist) who performs occupational health examinations.

Exchange Rate (or doubling rate)—The time-intensity exchange rate for determining length-intensity of equivalent exposure levels. The AF uses a 3-dB exchange rate. See Chapter 3, Hazardous Noise Surveillance Requirements.

Fitness and Risk Evaluation—Evaluations performed by medical and safety professionals for the purpose of determining a worker's ability to perform specific job tasks (fitness) and the likelihood of harm, either to the worker or others (risk), in relation to anticipated workplace exposures and job demands. In the USAF HCP, fitness and risk evaluations are the processes used to evaluate workers who, if placed at work in hazardous noise, may not be able to adequately perform essential duties or may pose a health or safety risk to themselves or others.

H-1 Profile—Hearing Profile threshold criteria (H-1 through H-4) are defined in AFI 48-123, *Medical Examination and Standards*. This criterion is used to identify workers for further evaluation to determine if they are able to capably and safely perform their job in a hazardous noise environment.

Hearing Conservation Center (HCC)—A center located at an Air Force Material Command (AFMC) base that provides support for referrals under the USAF HCP. HCCs do not dispense hearing aids. Authorized HCCs are listed in **Attachment 3**.

Hearing Conservation Diagnostic Center (HCDC)—An AF medical treatment facility staffed by an audiologist, otolaryngologist (ENT physician), and support staff. An HCDC gives direct clinical support to referrals under this standard and provides services to all other persons authorized medical care by AFI 41-115. Authorized HCDCs are listed in **Attachment 3**

Hearing Conservation Program Manager (HCPM)—Appointed by the MTF Commander or ARC Unit Commander, the HCPM, usually a credentialed provider, is responsible to manage all aspects of the HCP while ensuring OSHA/DoD/AFOSH compliance.

Hearing Conservationist—military or civilian member that is trained IAW Chapter 4.

Hearing Threshold Level (HTL)—The weakest sound intensity an individual can hear half the time. A level corresponding to the decibel level reading on the audiometer when the individual responds to at least 50 percent of the presentations.

Impulse or Impact Noise—A short burst of acoustic energy consisting of either a single burst or a series of bursts. The pressure-time history of a single burst includes a rapid rise to a peak pressure followed by a somewhat lower decay of the pressure envelope to ambient pressure, both occurring within 1 second. A series of impulses may last longer than 1 second. (See **Attachment 2**).

Military Unique Workplaces—DoD military and civilian operations and workplaces that are unique to the national defense mission. This includes combat and operation, testing, and maintenance of

military-unique equipment and systems such as military weapons, military-unique aircraft, military-unique ships, submarines, missiles, early warning systems, military space systems, ordnance, and tactical vehicles. It also includes operations such as peacekeeping missions; field maneuvers; combat training; naval operations; military flight and missile operations; military-unique Research, Development, Test, and Evaluation activities; and actions required under national defense contingency conditions.

Negative Threshold Shift (Improved Threshold Shift)—Same criteria as STS calculations except negative shift represent improved hearing levels. When this occurs, at least one follow-up test is required, and may be administered (immediately) the same day as the annual test. The result of the follow-up test may be used to establish a new reference audiogram, if required.

Noise-Free Audiogram (NFA—)-An audiogram performed after a worker has not been exposed to noise greater than 72 dBA or impulse noise greater than 120 dBP for a minimum specified amount of time. (e.g., 14-hour NFA, requires a minimum of 14 hours noise-free prior to the test). HPDs cannot be used to reach this noise-free status. All noise-free follow-up audiograms must be completed within 30 days of the annual audiogram.

Occupational Health Consultant—A physician, usually a Flight Surgeon that serves as consultant to PCM teams for operational health concerns, including review of problem audiograms, to determine if further testing is required before disposition. An audiologist can serve as a consultant for audiology/ hearing conservation review/disposition concerns.

OSHA Reportable Hearing Loss—Work related positive threshold shifts, for the worse, relative to the current reference audiogram of an average of 10 dB at 2000, 3000, and 4000 Hz, if the average level of hearing is at least 25 dB above audiometric zero, in either ear. PH will provide OSHA reportable hearing loss information to base safety for inclusion on the OSHA 300 Log or electronic equivalent. (Audiometric test results reflect the worker's overall hearing ability in comparison to audiometric zero. Therefore, using the worker's current audiogram, you must use the average hearing level at 2000, 3000, and 4000 Hz to determine whether or not the worker's total hearing level is 25 dB or more)

If at any step a "no" is encountered, the process ends and the hearing change is not recordable.

- **Step 1:** Compared to the original baseline audiogram or last audiogram showing a recordable shift in hearing, is there an STS in either ear (age adjustments allowed)? If yes, continue to step 2.
- **Step 2:** Is the average hearing level on the current hearing test at 2000, 3000, and 4000 Hz in the same ear greater than or equal to 25 dB HL (no age adjustments allowed[1])? If yes, continue to step 3.
- **Step 3:** Is the STS confirmed upon 30-day retest (or was a retest not conducted)? If yes, continue to step 4.
- **Step 4:**Has a qualified health care professional determined that the shift in hearing is more likely than not work-related? If yes, continue to step 5.
- **Step 5:** Record the case on Form 300 within 7 days of retest (or within 37 days of test if retest not conducted).

From: Megerson, Susan. 2002. "**OSHA's Final Rule for Recording Occupational Hearing Loss, "** CAOHC Update, available at **http://www.caohc.org/updatearticles/fall2002/osha.html**.

Otoscopic Examination—The act of viewing into the external auditory canal to the tympanic membrane. This exam is accomplished with the use of an otoscope.

Peak Pressure Level—The maximum absolute level, in dB, achieved for any specified time interval. (Peak pressure is the maximum absolute pressure, in Pascals, achieved.)

Permanent Threshold Shift (PTS)—Any STS found on monitoring audiometry which is still present after a second 14-hour NFA is considered a PTS. A STS on an annual audiogram must be considered a PTS if follow-up testing is not conducted in the specified time period.

Permissible Exposure Limit (PEL)—An 8-hour equivalent continuous A-weighted sound level of 85 dBA as a daily average.

Positive Threshold Shift (Poorer hearing from the reference)—Same criteria as STS calculations. Positive shift represent poorer hearing levels. When this occurs, two noise-free follow-up tests are required. The two noise-free tests may be completed on the same day but cannot completed on the same day as the annual audiogram. The result of the second follow-up test may be used to re-establish the reference audiogram or make appropriate audiologic referral for additional testing, if required.

Potential Hazardous Noise—Exposure to steady-state noise having an 8-hour TWA noise level $\geq$ (greater than or equal to) 85 dBA, or exposure to impulse/impact noise levels greater than 140dB peak SPL, regardless of duration.

Potentially Hazardous Noise Area—Any area where workers are likely to receive a daily total noise dose in excess of that calculated using enclosure 3, paragraph E3.1.2, or where impulse noise levels exceed 140 dB peak SPL.

Pre-placement Audiogram—All persons entering employment in hazardous noise (greater than or equal to an 8 hr. TWA of 85dBA, the OSHA limit) shall receive an audiogram prior to beginning work. The results of the pre-employment audiogram, if meeting the requirements of a reference audiogram, may be used as the reference audiogram.

Reference Audiogram—An audiogram used as a baseline to compare subsequent audiograms against to determine if hearing loss has occurred. All persons entering employment in hazardous noise (greater than or equal to an 8 hr. TWA of 85dBA, the OSHA limit) should receive a pre-placement audiogram that should be used as the reference audiogram. Also called baseline audiogram by OSHA.

Routine Noise Exposure—TWA noise levels determined by similar exposure group (SEG) for all AF employees (military and civilian) working in hazardous noise areas at least once and within 30 days of any change in operations affecting noise levels.

Sound Level (Noise Level)—The weighted sound pressure level measured by the use of a meter with characteristics and weighting A. B. or C. as specified in ANSI *Specification for Sound Level Meters* S1.4. The weighting must be indicated; otherwise the A-weighting is understood.

Sound Pressure Level—The sound pressure level of a sound, in dB, which is 20 times the logarithm to the base ten of the ratio of the pressure of this sound to the reference pressure of 20 microPascals (uPa) (20 microNewton/m2) (2 X 10^{-4} microbar).

Speech Interference Level (SIL)—The arithmetic average of the sound pressure levels, in dB, of a noise in the four octave bands of center frequency 500, 1000, 2000, and 4000 Hertz.

Standard or Significant Threshold Shift (STS)—A change in hearing thresholds relative to the reference audiogram of an average of 10 dB at 2000, 3000, and 4000 Hz, either ear, according to CFR 1910.95. That is, if the sum of the shifts at 2000, 3000, and 4000 Hz equals or exceeds 30 dB in either ear, a STS has occurred. Use of age corrections will NOT be applied when determining STS.

Temporary Threshold Shift (TTS)—A temporary loss of hearing due to noise exposure. Any positive STS that is not confirmed by the noise free follow-up test is considered to be a TTS, unless there is a resolved medical condition.

Termination Audiogram—A hearing test administered when a worker discontinues employment involving hazardous noise exposure. A Termination Audiogram should be accomplished when a hazardous noise exposed worker, who has been included on the HCP, separates or retires from military/ civil service. Individuals who are PCSing, PCAing, or will be in an inactive flying position shall not receive a Termination Audiogram.

Threshold Level—A sound level below which exposures are not included in dose calculations or measurements. For this standard, the threshold is 80 dBA.

Attachment 2

IMPULSE NOISE

A2.1. Impulse noise measurements shall be made using calibrated sound level meters (SLMs) that are as follows:

A2.1.1. Have a peak hold circuit.

A2.1.2. Have a rise time not exceeding 35 microseconds.

A2.1.3. Are capable of measuring peak SPLs in excess of 140 dB peak SPL.

A2.2. If SLMs meeting the requirements of subparagraph **A2.1.** above, are not available, a combination of calibrated instruments capable of indicating peak pressure level with a rise time not exceeding 35 microseconds and capable of measuring peak SPLs in excess of 140 dB may be used for impulse noise measurements.

A2.3. Impulse or Impact Exposure Limits. Unprotected exposures shall not exceed 140 dB peak sound pressure level. Above 140 dB peak sound pressure level, the applicable impulse noise limits are determined based on the expected number of exposures per day and the type of hearing protection used. **Table A2.1.** identifies the required hearing protection curve, shown in Figure A2.1, based on the type of protection and number of daily exposures. The limit for a given protection requirement becomes more restrictive (a lower curve limits exposures) as the number of impulses per day increases. Figure A2.1, shows the peak level versus B-duration curves, which limit the allowable exposure based on the type of protection worn. **Table A2.2.** lists the peak impulse levels produced at the ear by various weapons under non-reverberant conditions (outdoors) for a single shot. These levels should not be used for reverberant conditions (such as indoor firing ranges), and do not include the noise produced by other weapons firing near the shooter. These conditions must be measured to determine the peak SPL and B-duration

A2.4. Impulse Noise Evaluations**.** There are two types of measurements to be used in evaluating impulse or impact noise exposures screening measurements and detailed evaluations.

A2.4.1. Screening Measurements**.** To determine if levels exceed 140 dB peak sound pressure level, a sound level meter having the capability to measure impu1se or impact noise may be used to determine the peak of the impulse. This measurement shall be documented on the DD Form 2214, **Noise Survey,** or loaded into the environment, safety and occupational health-management information system (ESOH-MIS). If measurement shows the levels exceed 140 dB, the detailed evaluation shall be performed. Levels less than or equal to 140 dB may be evaluated to determine controls, however, no unprotected exposure is allowed for continuous noise levels above 115 dBA.

A2.4.2. Detailed requirements.

A2.4.2.1. Noise limits.

A2.4.2.1.1. Criteria. Applicable impulse noise limits are identified by the expected number of daily exposures and the type of hearing protection required. **Table A2.1.** identifies the required hearing protection for the respective impulse noise limits and expected number of daily exposures; the corresponding peak levels and B-duration values are shown in **Figure A2.1.**

A2.4.2.1.2. Maximum. The initial requirement is that impulse noise shall not exceed the limits specified for limit W in order to meet the hearing conservation criterion for unprotected ears. Limits X, Y, or Z, for which hearing protection is mandatory, shall be selected only if it can be clearly documented that meeting limit W is beyond the state-of-the-art, the cost of reducing the noise level to that specified for limit W is prohibitive, or that system effectiveness will be seriously degraded by reducing the noise level to that specified for limit W. Limits X, Y, or Z shall be selected only with the approval of the procuring activity subject to reduction of the level to the lowest value consistent with the state-of-the-art and the cost and effectiveness factors noted above. Impulse noise levels above limit W (i.e., anything greater than 140 dB) require the use of hearing protectors for any number of exposures per day. AFIOH/RSH Consultants should be contacted to perform determination of peak SPL and B- duration values.

Table A2.1. Impulse Noise Daily Exposure Limits Maximum Permissible Number (N) of Exposures/Day[1]

Impulse Noise Limit	No Protection	Either Plugs or Muffs	Both Plugs and Muffs	No Exposure Allowed
W	----------Unlimited Exposure----------			
X	0	1-2000	2001-40000	> 40000
Y	0	1-100	101-2000	> 2000
Z	0	1-5	6-100	> 100

[1] A single exposure consists of either (a) a single impulse for non-repetitive systems (systems producing not more than one impulse per second, e.g., rocket launchers fired from the shoulder), or (b) a burst for repetitive systems (systems normally producing more than one impulse per second). (MIL-STD-1474D)

The equation for calculating the allowable number of exposures per day is: (MIL-STD-1474D)

$$N_1 = 10^x \text{ where } x = \frac{1}{5}\left[177 - L + 6.64 \log_{10} \frac{200}{T}\right],$$
$$N_2 = 20 \text{ X } N_1, \text{ and}$$

N_1 = allowable number of impulses/day (single protection)

N_2 = allowable number of impulses/day (double protection)

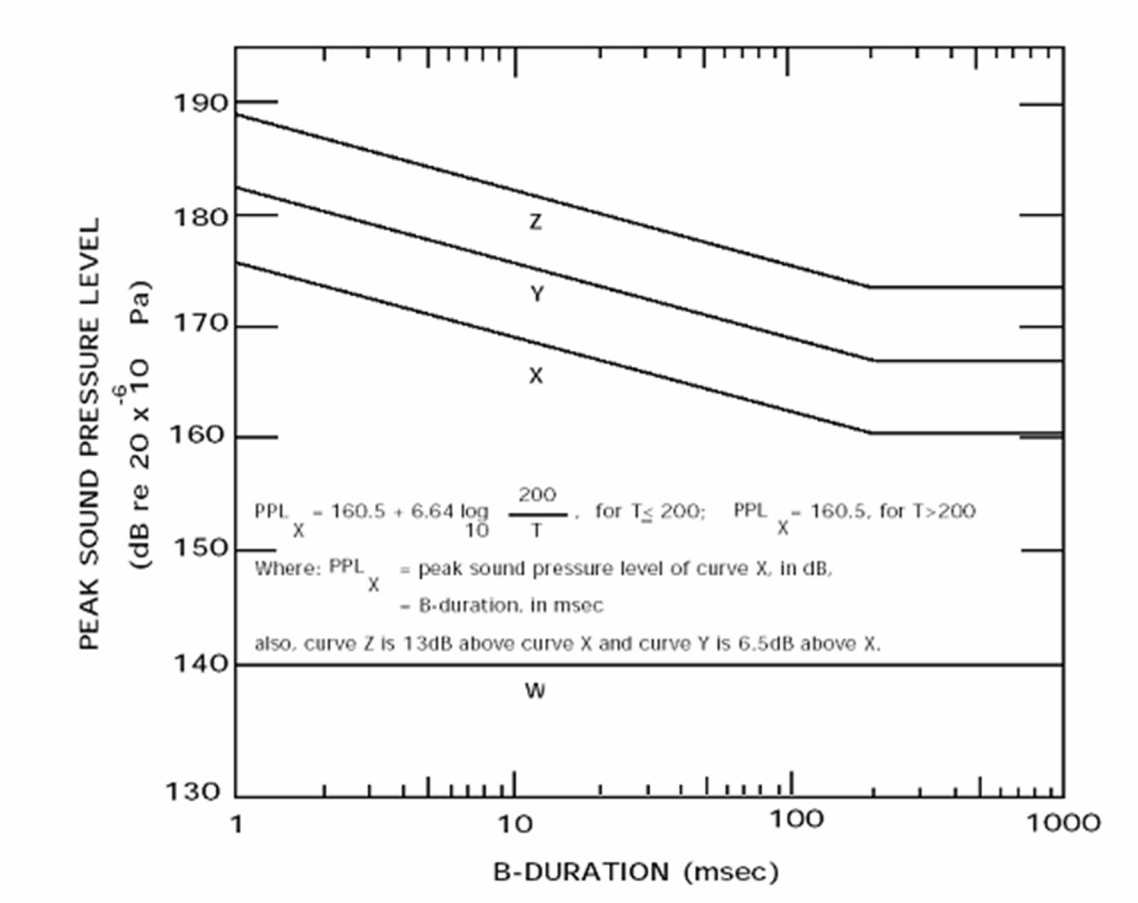
L = measured peak sound pressure level, in dB

T = measured B-duration in milliseconds

Table A2.2. Impulse Levels for Weapons.

Weapon (Ammunition Type)	Single Fire Peak Level (dB)
M1 Rifle, Cal.(.30)	161
M2 Machine Gun. Cal.(.50)	160
M4	158
M9 Pistol (9 mm)	155
M15 Pistol, Cal. (.38)	155
M16 Rifle (.22 cal)	153
M16 Rifle (5.65 mm)	156
M-29 Mortar (81 mm)	161
M67 Recoilless Rifle (90 mm)	188
M60 Machine Gun (7.62 mm)	155
M-203 Grenade Launcher (40 mm)	150
M240	158
M249	160
M870 Shotgun (12 Gauge)	155
M1911A1 Pistol (.45 cal)	158
MK-19 Grenade Launcher (40 mm)	142
XM148 Grenade Launcher (40 mm)	142
NOTE: Levels measured outdoors at shooter's ear with no other weapons firing. The B-duration is dependent on reflections produced in operating environment and is determined for each situation.	

Figure A2.1. Impulse Noise Limit Curves (MIL-STD-1474D)



NOTES:

(MIL-STD-1474D)

1. See **Table A2.1.** to select curve for use.
2. For peak sound pressure levels falling between (but not outside) the labeled curves, the permitted number of exposures should be estimated conservatively based on the higher curve.
3. Use of levels in excess of limit W requires hearing protection.

Example 1: Five students fire 25 rounds each in an M1 rifle class. The range is semi-enclosed. The average B-duration is found to be 500 milliseconds, and the peak pressure level is 161 dB, as shown in **Table A2.2.** This is the only class the instructors are teaching for the day. What hearing protection is required?

1. Plot the peak pressure level versus the B-duration on **Figure A2.1.** In this case, the point plotted is above the X curve but below the Y curve. Therefore, the Y curve is the impulse noise limit.

2. To determine the number of exposures for the day, multiply 25 rounds per student by 5 students to get a maximum of 125 exposures.

3. In the left column of **Table A2.1.**, titled "Impulse Noise Limit," find the Y row. Note that no exposures are allowed without hearing protection, and only 100 exposures are allowed with single protection, but up to 2000 exposures are allowed with both plugs and muffs. Therefore, dual hearing protection is required.

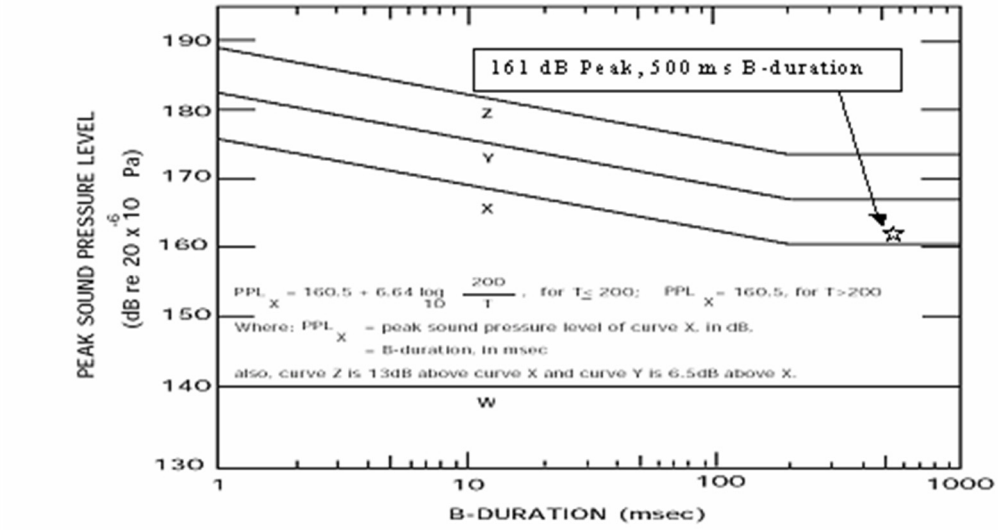


Figure A2.1

Table A2.1 Impulse Noise Daily Exposure Limits

Impulse Noise Limit	Maximum Permissible Number (N) of Exposures/Day[1]		
	No Protection	Either Plugs or Muffs	Both Plugs and Muffs
W	----------	Unlimited Exposure	----------
X	0	2000	40000
Y	0	100	2000
Z	0	5	100

Example 2: Eight students fire 800 rounds each in an M60 class, in bursts of 4 rounds each (automatic mode). The average B-duration is found to be 14 milliseconds. The peak pressure level from **Table A2.2.** is 155 dB. What hearing protection must instructors wear if this is their only class of the day?

1. Plot the peak pressure level versus B-duration on **Figure A2.1.** The point is above the W curve but below the X curve, so the X curve is the noise limit.

2. To determine the number of exposures for the day, multiply 800 rounds per student by 8 students and then divide by 4 rounds per burst (4 rounds per exposure). 1600 exposures are expected.

3. In the left column of **Table A2.1.**, find the X row. No exposures are allowed without hearing protection, but up to 2000 exposures are allowed with either plugs or muffs. Therefore, single hearing protection is required.

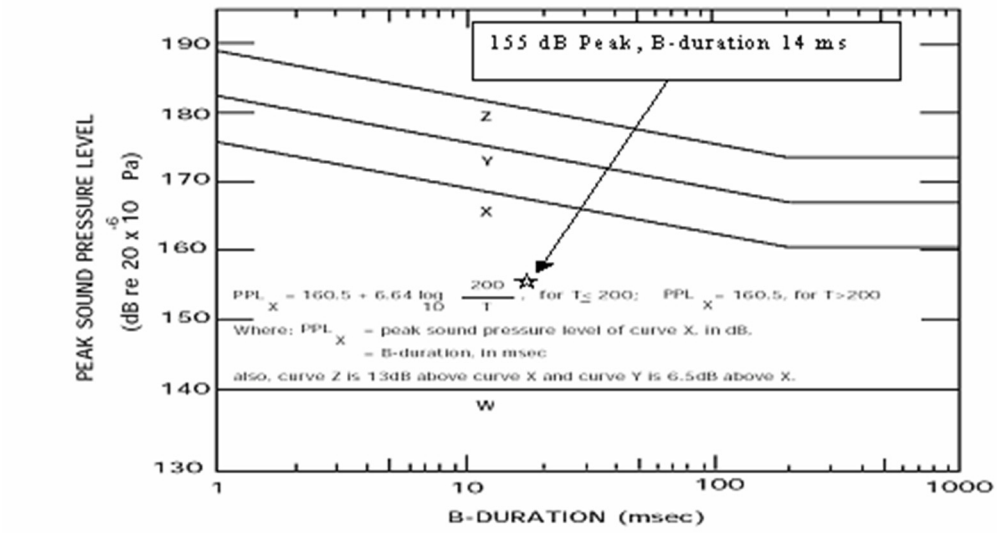


Figure A2.1

Table A2.1 Impulse Noise Daily Exposure Limits

Impulse Noise Limit	Maximum Permissible Number (N) of Exposures/Day[1]		
	No Protection	Either Plugs or Muffs	Both Plugs and Muffs
W	----------	Unlimited Exposure	----------
X	0	2000	40000
Y	0	100	2000
Z	0	5	100

Example 3: There are three students in an M60 class. For operational reasons, the students cannot wear earmuffs, but they can wear earplugs. The average B-duration is found to be 14 milliseconds. The peak pressure level from **Table A2.2.** is 155 dB. If students fire four-round bursts, how many rounds can they fire in a class with only earplugs?

1. Plot the peak pressure level versus B-duration on **Figure A2.1.** The point is above the W curve but below the X curve, so the X curve is the noise limit.

2. Using **Table A2.1.** below, find the intersection of the X row and the column marked "Either Plugs or Muffs." See that the number of exposures is not to exceed 2000.

3. Since the students are firing an average of 4 rounds per burst, the total number of rounds they can fire is 4 times 2000, or 8000 rounds. Therefore, each student can safely fire 8000 divided by 3, or 2666 rounds.

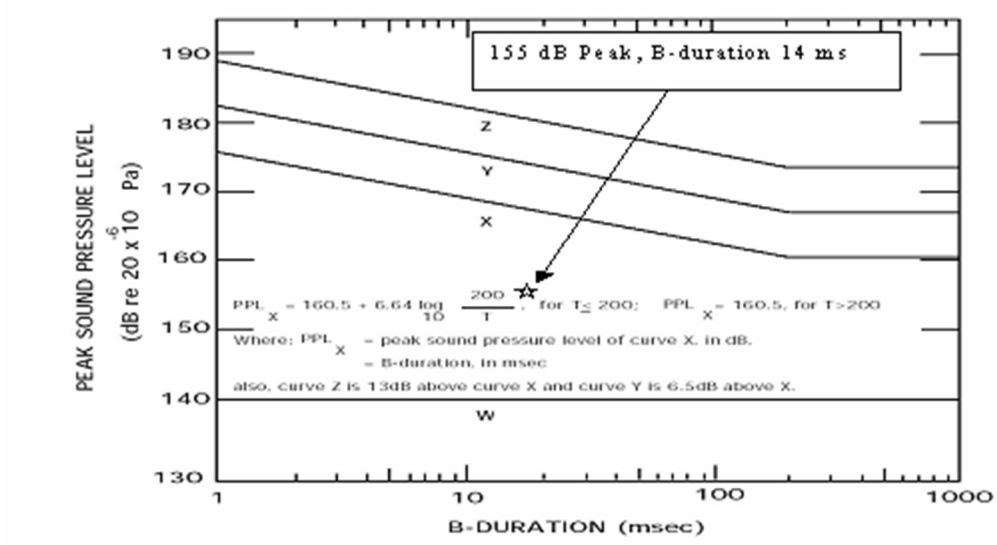


Figure A2.1

Table A2.1 Impulse Noise Daily Exposure Limits

Impulse Noise Limit	Maximum Permissible Number (N) of Exposures/Day[1]		
	No Protection	Either Plugs or Muffs	Both Plugs and Muffs
W	----------	Unlimited Exposure	----------
X	0	2000	40000
Y	0	100	2000
Z	0	5	100

Attachment 3

AUTHORIZED HEARING CONSERVATION DIAGNOSTIC CENTERS (HCDC)

- 1st MDG/SGPSA, 45 Pine Street, Langley AFB, VA 23665-2080
- 3 MDG/SGOSLA, 24800 Hospital Dr. Elmendorf AFB, AK 99506-3700
- 6 MDG/SGOSL, 8415 Bayshore Blvd, MacDill AFB, FL 33621-1607
- 10 MDG/SGOSL, 4102 Pinion Drive, USAF Academy, CO 80840-4000
- 31 MDG/SGOR, Unit 6180 Box 245, Aviano AB, APO AE 09604
- 48 MDG/SGOSL, Unit 5210 Box 230, RAF Lakenheath, APO AE 09464-0230
- 52 MDG/SGOR, Unit 3690, Spangdahlem AB, APO AE 09123-3690
- 55 MDG/SGOSL, 2501 Capehart Rd. Suite 1K47, Offutt AFB, NE 68133-2160
- 59 MEDW/MMKRA, 2200 Bergquist Dr. Ste.1, Lackland AFB, TX 78236-5300
- 60 MDG/SGCXA, 101 Bodin Circle, Travis AFB, CA 94535-1880
- 81 MSGS/SGCQLA, 301 Fisher St., Room 1A132, Keesler AFB, MS 39534
- 82 MDG/SGOSLA, 149 Hart Street, Ste.5, Sheppard AFB, TX 76311-3482
- 86 MDS (LRMC), Attn: Audiology Clinic, CMR 402, APO AE 09180
- 88 MDG/SGPOD, 4881 Sugar Maple Dr., Wright-Patterson AFB, OH 45433-5529
- 89 MDG/SGPFA, 1050 West Perimeter Rd., Andrews AFB, MD 20762-6600
- 96 MSGS/SGCXL, 307 Boatner Rd., Eglin AFB, FL 32542-1282
- 374th MDOS/SGOSL, Unit 5227 Bldg 4408, Yokota AB, APO, AP 96328-5227
- 375 MDG/SGCQSL, 310 W. Losey Street Bldg 1530, Scott AFB, IL 62225-5252

AUTHORIZED HEARING CONSERVATION CENTERS (HCC)

- 72 AMDS/SGPMA, 3001 Staff Dr. Room D, Tinker AFB, OK 73145-5300
- 74 AMDS/SGPOD, 2325 Fifth Street, Wright-Patterson AFB, OH 45433-7021
- 75 AMDS/SGPMA, 7238 6th Street, Hill AFB, UT 84056-5012
- 78 AMDS/SGPFA, 655 7th Street Bldg. 207, Robins AFB, GA, 31098-2227

Attachment 4

SAMPLE REFERRAL LETTER

Hearing Conservation Program Manager

USAF Hearing Conservation Audiological Evaluation

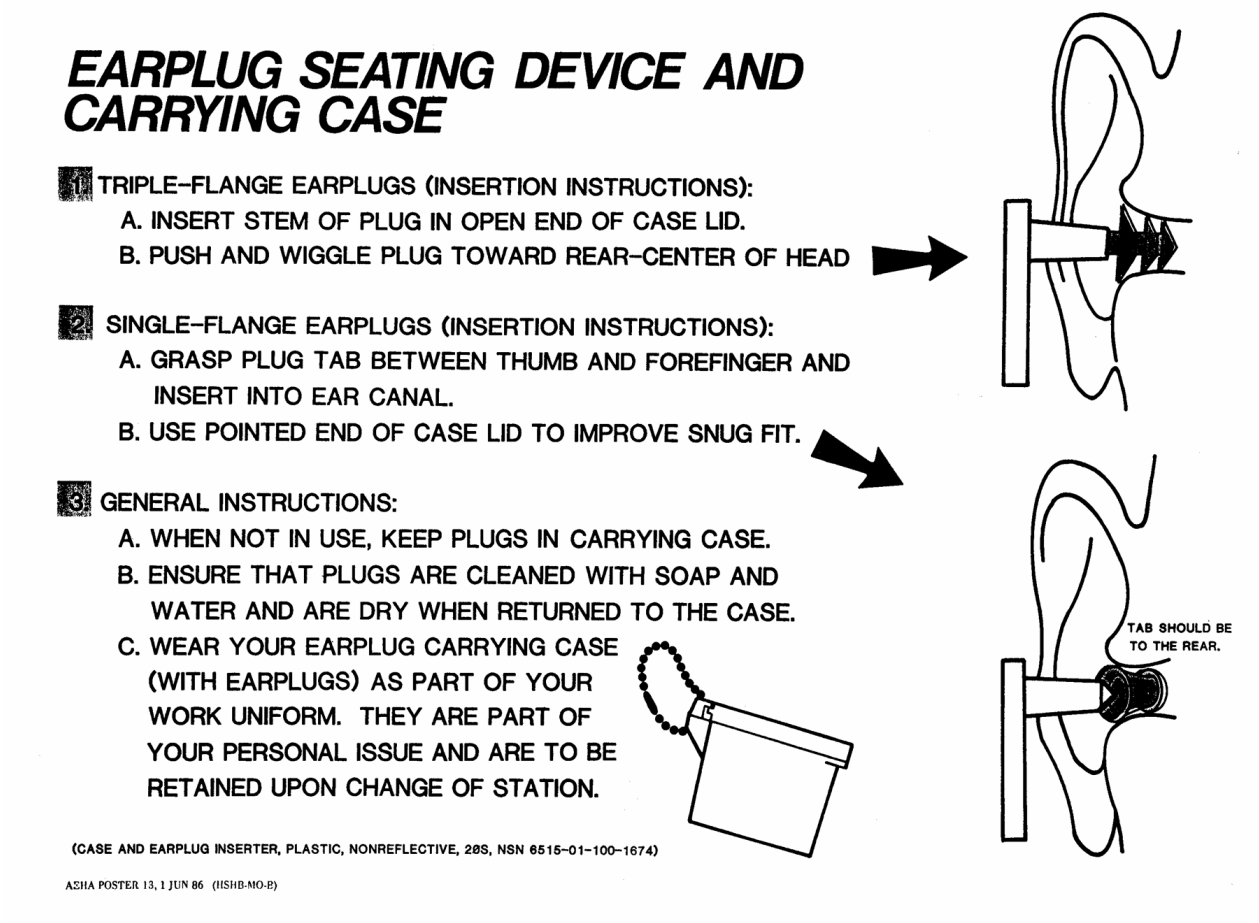
Consultant's Name

1. (Patient's Name) is referred for an audiological evaluation to assist in determining if allowing him/her to perform duties as a (job title) in a hazardous noise environment will pose risk to their personal health and safety or the health and safety of others. The reasons for this referral are indicated on the attached Hearing Conservation Diagnostic Center Referral. As part of your evaluation, please perform the following:
   a. Pure tone air conduction test, under earphones, using pulsed tones for frequencies 250 Hz through 8000 Hz (to include 3000 and 6000 Hz).
   b. Pure tone bone conduction test, using pulsed tones for frequencies 500 through 4000 Hz (to include 3000 Hz).
   c. Word Recognition Testing, under earphones, using taped or CD lists presented at 70 dBHL.
   d. Immittance measures to include tympanometry, acoustic reflexes obtained for both ipsilateral and contralateral conditions. Acoustic reflex decay at 500-1000 Hz should be accomplished if clinically warranted. **NOTE**: All tests must be performed unaided and with equipment calibrated per the most current and applicable ANSI standards.
   e. Otoacoustic Emissions testing is required for a Hearing Conservation referral.
2. In addition to performing the above tests, please complete the Recommendations, Dispositions, and Results portion of the attached referral and provide us your written opinion on the following:
   a. Can this worker be fitted with and wear standard personal hearing protection devices?
   b. Will allowing this worker to perform this job while wearing hearing protection pose an increased risk to either personal safety or the safety of others?
   c. Does this patient possess sufficient auditory acuity skills to perform necessary job tasks while wearing hearing protection?
   d. Are other medical factors present that might affect this patient's fitness and risk?
   e. Should a new reference be established? If so, using what results.
   f. Other consideration.
3. Please direct any questions you may have concerning this patient to (name and phone number of referring practitioner).

MTF COMMANDER SIGNATURE

Attachment 5

EARPLUG SEATING DEVICE AND CARRYING CASE POSTER

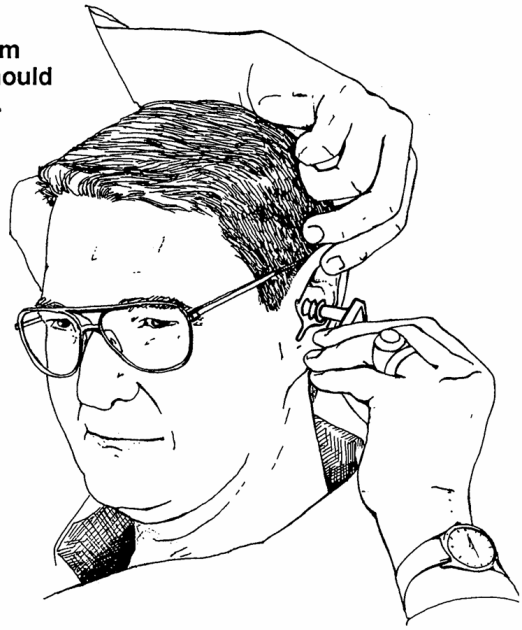


Attachment 6

GENERAL INFORMATION POSTER

Earplugs: General Information

1. Make the ear canal accessible by reaching over the head with opposite hand and pulling ear outward.
2. A good seal should be accomplished by a vacuum sensation (a back pressure). Also, your voice should sound muffled to you as if talking inside a barrel.
3. Plugs tend to work loose as a result of talking and chewing and must be reseated.
4. Little difficulty is experienced understanding speech when plugs are worn, if the voice is raised slightly above the level of ordinary conversation.
5. Even a small leak defeats the purpose of wearing plugs.
6. Keep plugs clean with soap and water, but ensure plugs are dry when returned to case. When not in use, keep plugs in plastic carrying case provided.
7. Earplugs are part of your personal issue and are to be retained upon change of station.



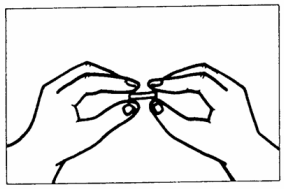
Attachment 7

FOAM EARPLUG INSTRUCTION POSTER

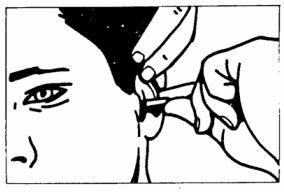
FOAM EARPLUGS

FOR MAXIMUM EFFECTIVENESS AND COMFORT INSERT FOAM EARPLUGS (NSN 6515-00-137-6345) AS FOLLOWS: IMPORTANT - HANDS AND PLUGS SHOULD BE CLEAN PRIOR TO USE. DO NOT USE WHERE HAZARDOUS CHEMICALS OR MATERIALS COULD BE TRANSFERRED TO PLUG.

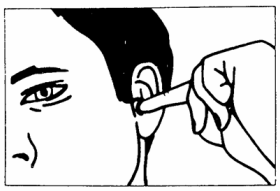
1 WITH BOTH HANDS GRASP THE ROUND SIDE OF THE PLUG. SLOWLY ROLL AND COMPRESS THE PLUG INTO A VERY THIN, CREASE-FREE CYLINDER.



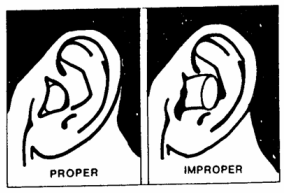
2 WHILE COMPRESSED, INSERT THE PLUG WELL INTO THE EAR CANAL. FITTING THE PLUG IS EASIER IF THE OUTER EAR IS PULLED OUTWARD AND UPWARD DURING INSERTION.



3 WITH FINGERTIP, GENTLY HOLD THE PLUG IN PLACE UNTIL IT BEGINS TO EXPAND AND BLOCK THE NOISE. QUALITY OF FIT MAY BE ESTIMATED BY OBSERVATION.



4 EARPLUG FIT CAN BE TESTED IN THE PRESENCE OF NOISE BY ALTERNATELY COVERING AND UNCOVERING THE EARS WITH TIGHTLY PRESSED HANDS. WITH PROPERLY FITTED PLUGS THE NOISE LEVELS SHOULD SEEM NEARLY THE SAME WHETHER OR NOT THE EARS ARE COVERED. KEEP PLUGS CLEAN BY WASHING IN MILD SOAP AND RINSING THOROUGHLY IN WATER. DISCARD IF DISCOLORATION OR DISFIGURATION OCCURS AFTER CLEANING.



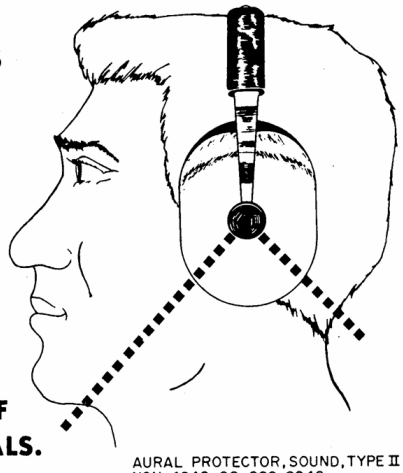
DA Poster 40-501B, Apr 1991 DISTRIBUTION: To be distributed in accordance with DA Form 12-04, block 0656, requirements for DA Poster 40-501B.

Attachment 8

NOISE MUFFS: GENERAL INFORMATION POSTER

EAR MUFFS: GENERAL INFORMATION

1. ADJUST HEADBAND TO INSURE EARCUP SEALS ARE IN COMPLETE CONTACT WITH HEAD.
2. EARCUP SEALS MUST FIT WELL AROUND TEMPLES OF EYEGLASSES.
3. THE TYPE II EAR MUFF CAN BE WORN OVER THE HEAD, BEHIND THE HEAD OR UNDER THE CHIN.
4. WHEN EAR MUFFS ARE PROPERLY WORN, YOUR OWN VOICE SHOULD SOUND MUFFLED TO YOU AS IF TALKING INSIDE A BARREL.
5. DO NOT BEND, ALTER OR MODIFY ANY PART OF HEADBAND, CUPS, CUP LINING OR EARCUP SEALS.
6. REPLACE EARCUP SEALS THAT HAVE BECOME HARDENED, DAMAGED OR OTHERWISE UNSERVICEABLE.
7. EVEN A SMALL LEAK ELIMINATES THE PROTECTION PROVIDED BY EAR MUFFS.



AURAL PROTECTOR, SOUND, TYPE II
NSN 4240-00-022-2946

DA Poster 40-501F, Apr 1991 DISTRIBUTION: To be distributed in accordance with DA Form 12-04, block 0656, requirements for DA Poster 40-501F.

Attachment 9

AUDIOMETRIC INSTRUCTIONS POSTER

AUDIOMETRIC INSTRUCTIONS

SELF-RECORDING

1. THIS IS A HEARING CHECK.

2. YOU WILL BE LISTENING FOR SOME TONES. EACH TIME YOU HEAR A TONE, PRESS THE BUTTON. WHEN THE TONE GOES AWAY RELEASE THE BUTTON.

3. NO MATTER HOW FAINT THE TONE, PRESS THE BUTTON WHEN YOU HEAR THE TONE AND RELEASE THE BUTTON WHEN THE TONE GOES AWAY.

4. UPON COMPLETION OF YOUR HEARING CHECK, PLEASE REMAIN SEATED AND QUIET UNTIL THE OPERATOR RELEASES YOU.

AEHA POSTER 10-2, [illegible] JUN 86 (HSHB-MO-B)

USAEHA

Attachment 10

OWCP HEARING LOSS MEDICAL REQUIREMENTS AS PARAPHRASED FROM DOL OWCP HEARING LOSS SECTION INSTRUCTIONS

A10.1. The report submitted must include the results of an otological (ENT) exam, conducted by a physician, and the results of an audiological exam administered in a sound-treated booth.

A10.2. The report of the physician's ENT examination must include:

A10.3. The date and hour of examination;

A10.4. The date and hour of the claimant's last exposure to employment related noise;

A10.5. A detailed and relevant medical history;

A10.6. The physician's reasoned opinion concerning the etiology of any indicated hearing loss and, specifically, its relationship to the claimant's occupational noise-exposure history;

A10.7. The physician's recommendations for treatment, including the need for a hearing aid; and, the physician's original signature.

A10.8. The report of the audiological evaluation must include:

A10.9. An authenticated, legible, and dated audiogram consisting of pure tone air conduction threshold from 250 to 8000 Hz, including 3000 Hz, and bone conduction thresholds from 250 to 4000 Hz, also including 3000 Hz;

A10.10. The results of speech reception threshold (SRT) and speech discrimination testing, including stimuli and method of presentation (SRT and pure tone average (PTA) should agree within ± 10 dB);

A10.11. The results of an impedance test battery, including tympanometry and stapedial reflex threshold measurements;

A10.12. The standard and date of last electronic calibration, and the name of the person who performed the calibration, (our procedures require that the date of last electronic calibration be within 1 year of the date of examination) for each instrument used;

A10.13. A statement regarding the reliability of the audiological evaluation (if questionable, administer additional tests so that reliable conventional audiometric responses will be obtained); and, a statement indicating that the claimant was removed from any exposure to injurious noise for at least 16 hours prior to your examination.

A10.14. Please forward both the ENT report and the audiological evaluation to this office. Bills may only be paid when we have received the ENT report and the audiological evaluation.