Navy and Marine Corps Public Health Center
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# NAVY MEDICAL DEPARTMENT HEARING CONSERVATION PROGRAM PROCEDURES

**September 15, 2008**

**NAVY AND MARINE CORPS PUBLIC HEALTH CENTER**

## BUREAU OF MEDICINE AND SURGERY

## FOREWORD

Noise-induced hearing loss is among the most prevalent occupational health hazards in the military. Significant monetary compensation is expended for auditory disability. Hearing loss negatively affects job performance, productivity, efficiency and operational readiness. Auditory fitness for duty is crucial for maintaining an effective work force, a safe work environment, and employee quality of life. To mitigate the effects of hazardous noise on military and civilian employees, a Hearing Conservation Program was instituted.

Commands are responsible for implementing and administering the Hearing Conservation procedures within their organization, and for ensuring their administrative issuances meet the criteria of this instruction to the maximum extent possible. Implementing directives shall not duplicate this instruction, but may provide further guidance where options have been indicated.

References (a) through (e) indicated on page 4 establish the basic requirements for the Navy Hearing Conservation Program (HCP). This Technical Manual provides guidance for implementation of those portions of the Navy HCP for which the Medical Department is responsible and supplements references (b) and (c).

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## REFERENCES

(a) DODINST 6055.12 "DOD Hearing Conservation Program," March 5, 2004.

(b) OPNAVINST 5100.23 (Series) "Navy Occupational Safety and Health (NAVOSH) Program Manual."

(c) OPNAVINST 5100.19 (Series) "Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat."

(d) NAVENVIRHLTHCEN Technical Manual, NEHC-TM 91-2, "Industrial Hygiene Field Operations Manual."

(e) NAVMED P-5132 "Equipment Management Manual," January 3, 2008.

# CHAPTER 1
# NAVY MEDICAL DEPARTMENT HEARING CONSERVATION PROGRAM PROCEDURES

C1.1. Program Elements. A successful HCP requires cooperation and collaboration between the Commanders, Safety Officers and Supervisors of noise hazardous areas and the Medical Department. All share in the responsibilities for HCP implementation, and success in hearing loss prevention. The Navy Hearing Conservation Program consists of the following elements:

**Noise Measurement:** Noise measurement and exposure analysis to identify noise hazardous areas or sources and the personnel exposed;
**Engineering Control:** Engineering control of noise levels to reduce the potential hazard to the maximum extent feasible;
**Hearing Testing:** Periodic hearing testing of all personnel at risk to monitor the effectiveness of the program, and enable timely audiologic and medical evaluation of those personnel who demonstrate significant hearing loss or threshold shift;
**Hearing Protective Devices:** Recommendations for use of hearing protective devices as an interim measure pending effective engineering controls;
**Education:** Education regarding potentially noise hazardous areas and sources, use and care of hearing protective devices, the effects of noise on hearing, and the command's HCP.

C1.2. Noise Measurement and Exposure Analyses. For use in the HCP, noise measurements must be taken by an industrial hygienist, audiologist, safety specialist, exposure monitor, or others who have received appropriate training such as the Exposure Monitoring course or other training approved by the Navy and Marine Corps Public Health Center (NMCPHC).

C1.2.1. Instruments. Sound level meters (SLM) and noise dosimeters are used to assess an individual's exposure to noise. Octave band analyzers (OBA) are used to identify the frequencies at which the noise is generated and are mainly used to aid in selecting engineering controls and in the certification of audiometric booths. Detailed information on Sound Level Meters, Dosimeters, Octave Band Analyzers, and procedures for conducting

Noise Surveys may be found in Chapter 5 of the Industrial Hygiene Field Operations Manual, reference (d). This information may be found at the following website: http://www-nmcphc.med.navy.mil/ih/ihfom.htm.

C1.2.2. Noise Measurement Records. All noise measurements and pertinent information are documented on NEHC 5100/17, "Industrial Hygiene Noise Survey Form" or NEHC 5100/18 "Industrial Hygiene Noise Dosimetry form" or an equivalent computer generated form. For noise dosimetery, the eight hours time weighted average (TWA) with a 3 dB exchange rate must be recorded. For sound pressure level (SPL) readings, the real time SPL readings in dB(A) must be recorded; also record dBC levels if possible. Noise exposure data and analysis must be provided to the individual, the command, and the activity providing medical surveillance.

C1.2.3. Noise Surveys. Initial and periodic noise surveys must be conducted in accordance with the most recent version of reference (d). Personnel working in potentially hazardous noise areas will be identified by their parent activity and their names placed on a roster for inclusion in the HCP. This program will include hearing protector fitting, education, and audiometric monitoring.

C1.2.4. Identification of Personnel at Risk. An 8-hour TWA exposure level with a 3 dB exchange rate will be determined for all military and civilian employees routinely working in hazardous noise areas, as required by reference (a). This may be accomplished by representative sampling of similarly exposed groups (SEG). These measurements are made at least initially and within 30 days after notification of any significant change in operations. While it is the responsibility of the Medical Department Industrial Hygiene Office to identify noise hazardous areas and equipment within a command, it is the command's responsibility to determine which personnel are employed in those noise hazards and ensure their enrollment in the HCP.

C1.2.4.1. In the absence of dosimetric evidence and/or professional assessment to the contrary, personnel exposed to sound levels of 85 dB(A) or above, eight hours TWA or 140 dB peak sound pressure level (SPL) for impact or impulse noise will be considered at risk and identified on the command's roster for inclusion in the HCP. As a rule of thumb, routinely may be defined as when the TWA exceeds 84 dB(A) on average more than 2 days in any month. Individuals who exceed these criteria should be considered at risk.

C1.2.4.2. Non-enrollment of personnel requires consultation with an industrial hygienist, operational audiologist, or occupational medicine physician, who will need to know the noise levels as determined by sound level survey, the approximate frequency and duration of the individual's exposure, and pertinent audiometric history, i.e. is there any evidence of a noise induced hearing loss? The consultant will either make a professional judgment or arrange for further evaluation. Consultation may be informal (example, e-mail) as long as there is a written record available. Individuals should not be enrolled if there is clear evidence that they are not at risk.

C1.2.4.3. Additionally, risk assessment codes (RACs) will be assigned and the type of control measures used will be identified for all potentially hazardous noise areas and operations, in accordance with reference (b). A current inventory of all potentially noise hazardous areas and operations will be maintained. This is typically provided in the baseline industrial hygiene survey, which should be updated by an industrial hygienist upon notification of significant changes in operation or equipment.

C1.2.4.4. Questions regarding the health effects of unusual noise exposures should be directed to NMCPHC. Such exposures may include, but are not limited to, the following:

- Greater than 16 hours continuous or intermittent exposure per day;
- Intense low frequency noise, that is, when the difference between the C-weighted and A-weighted values is greater than 15 dB;
- High intensity noise above 140 dB(A) sound pressure level;
- Impulse/impact noise above 165 dB peak sound pressure level;
- Alteration or other change in facility.

**Exceptions**. Although hearing conservation measures are required when noise levels are 85 dB(A) or above, the implementation of all available measures of the program may not be necessary in every case. For example:

Visitors to a hazardous noise area are required to wear hearing protection, but are not required to have their hearing tested or be included on a roster of noise exposed personnel. There may also be unique situations where sound levels rise unpredictably above 85 dB(A) for short durations so the wearing of hearing protective devices may be judged impractical or

unnecessary. Decisions to waive the use of hearing protective devices must not be made arbitrarily. An audiologist, industrial hygienist, or other qualified professional should render such professional judgments using approved instrumentation and considering all relevant factors.

C1.2.5. Engineering Controls. As noise hazards are identified and evaluated, every effort must be made to eliminate or reduce them. Industrial Hygienists, command leaders, Facilities Managers and Safety Managers will collaborate on appropriate engineering controls and apply processes for reducing or eliminating the noise, if at all possible.

C1.2.6. Hearing Testing. All personnel enrolled in the HCP are required to have an annual hearing test. The Medical Department is responsible for the provision of hearing tests. The individual's Command Safety Officer is responsible for ensuring that noise exposed individuals report for all annual and required follow-up hearing tests, to include diagnostic audiology evaluations.

C1.2.6.1. Audiometric Equipment Requirements.

C1.2.6.1.1. Audiometric test chambers used for reference and monitoring audiometry will be certified annually with a Type 1 Octave Band Analyzer (OBA) meter meeting the requirements of the most recent version of ANSI S1.11. Recertification is also required when a chamber, including Mobile Hearing Conservation and Testing Vans (MOHCAT), is re-located and whenever there is a significant change in ambient noise levels that could affect hearing testing. Maximum permissible ambient noise levels in clinical booths are identified in ANSI S3.1-1999. A field guide to audiometric booth certification for both clinical and medical surveillance purposes is provided as Appendix B. Certification is performed by an industrial hygienist, audiologist, or others meeting guidelines established by NMCPHC. A sample booth certification form for medical surveillance is provided as Appendix A. Interior sound levels for HCP booths cannot exceed the following octave band SPLs identified by reference (a):

| | |
|---|---|
| 500 Hz. | - 27 dB |
| 1000 Hz. | - 29 dB |
| 2000Hz. | - 34 dB |
| 4000Hz. | - 39 dB |
| 8000 Hz. | - 41 dB |

C1.2.6.1.2. Preventive and minor maintenance of audiometers which does not affect calibration is accomplished by

the local medical equipment maintenance and repair facility in accordance with reference (e). A local pool of audiometers for loan may be maintained for branch clinics and fleet activities, where necessary, to be used for exchanging defective units which cannot be repaired locally. The local HCP Manager will control this pool. Guidance concerning the pool or for assistance with audiometer repair, calibration, or loan may be obtained by contacting the audiometer calibration and repair staff at the NMCPHC.

C1.2.6.1.3. All active duty hearing conservation test sites must use a microprocessor audiometer with the most recent version of the Defense Occupational and Environmental Health Readiness System - Hearing Conservation (DOEHRS-HC) software for all hearing conservation testing. The most current version may be obtained by contacting the Military Health System (MHS) helpdesk at 1-800-600-9332 or e-mail: help@mhs-helpdesk.com. Software maintenance patches must also be uploaded on a monthly basis. These patches are located at the DOEHRS-HC Data Repository (DR) website at: (https://doehrswww.apgea.army.mil/doehrsdr). After logging onto the website, HC Patches are found under the DOEHRS-HC menu. Follow the instructions for downloading the patch.

C1.2.6.1.4. An exception to using microprocessor-based DOEHRS-HC audiometry includes patients who require manual audiometry (tinnitus patients, hard-to-test patients, and referrals to the Audiologist). In this instance, the manual audiometer test results will be manually entered into the DOEHRS-HC software and uploaded to the DOEHRS-HC DR to ensure the central data repository remains current on all hearing conservation test results. It is recommended that each audiologist have the DOEHRS-HC software loaded onto their desktop to allow entering of re-established baseline audiograms.

C1.2.6.1.5. Problems with DOEHRS-HC software must be reported to the MHS Help Desk (contact information provided above). Emails should include a brief, but detailed description of the problem including screen captures (if possible), error messages, the software version being used, and user and facility contact information.

C1.2.6.1.6. Audiometers will be calibrated by physical methods at least annually for compliance with the most recent version of ANSI Standard S3.6-1996, "Specifications for Audiometers." Calibration and repairs affecting calibration is available from NMCPHC at no cost for all DOEHRS-HC microprocessor audiometers used in the HCP. For remote activities, or for activities where local calibration is

preferred or necessary, the cost will be borne by the testing facility. Guidance is available from NMCPHC, please consult reference (e). The calibration of clinical or diagnostic audiometers used in otolaryngology or audiology clinics are not part of the NMCPHC service. Requirements for these are found in ANSI S3.6-1996.

C1.2.6.2. Daily Listening and Biological Calibration Checks.

C1.2.6.2.1. A listening check will be performed every day the equipment is used and may be logged on a local form.

C1.2.6.2.2. A biological calibration check is performed each day the equipment is used. Results are electronically recorded on a DD Form 2217. Reserve sites and other locations not using the DOEHRS system may use hard copy DD2217 forms. Biologic calibrations must be available for review (upon request) for up to five years. An electro acoustic device or normal hearing listener with pre-recorded baseline thresholds may be used to complete the biologic calibration check. If the daily biological test results differ from the baseline audiogram by more than +/- 5dB at 500 - 4000 Hz, or more than +/- 10 dB at 6000 Hz, a second normal "listener" (human or bio-acoustic simulator) with a reference on file must be tested and results compared against recorded reference hearing values for that listener. Removal from service and recalibration of the audiometer is necessary if the second listener's biological test result also fails calibration.

C1.2.6.3. Provider Credentials.

C1.2.6.3.1. Supervision. Audiometric testing will be supervised by an audiologist, otolaryngologist, occupational medicine physician, or other qualified physicians who, by training or experience, have the knowledge to manage hearing loss cases.

C1.2.6.3.2. Technician Certification/Re-certification. Audiometric testing will be performed by technicians certified in occupational hearing conservation. Successful completion of a Hearing Conservation Certification Course authorized/approved by the NMCPHC is required for certification. This training is usually provided by a military or civil service audiologist who is a Certified Course Director with the Council for Accreditation in Occupational Hearing Conservation (CAOHC). See http://www-

nmcphc.med.navy.mil/occmed/AUDIOTNG.HTM to view lists and contact information concerning certified Navy courses.

C1.2.6.3.3. Equivalent training sponsored by other military services may be utilized with prior permission/coordination from NMCPHC. Recertification training is necessary every five years. An annual technician competency must be annotated and maintained in the individual's training file. Certification may be extended for up to 60 days with the concurrence of the audiologist or physician supervising their testing. Guidance concerning maintenance on documentation of technician proficiency is provided in Appendix C.

C1.3. Audiometry. The Medical Department is responsible for provision of audiometric testing for personnel enrolled in the HCP. Hearing tests will consist of pure tone, air conduction hearing threshold measurements at test frequencies of 500, 1000, 2000, 3000, 4000, and 6000 Hz. Each ear will be tested separately. Commands receiving this support must provide denominator/enrolment data, UIC data and program specifics to the Regional Audiologist or HCP Manager to ensure effective HCP management and success.

C1.3.1. Reference Hearing Tests. The reference hearing test will not be obtained unless the individual has been free from exposure to noise above 80 dB(A) for at least 14 hours. **THIS REQUIREMENT MAY NOT BE MET BY WEARING HEARING PROTECTIVE DEVICES. THIS NOISE FREE REQUIREMENT INCLUDES EXPOSURE TO NOISE FROM NON-OCCUPATIONAL SOURCES.**

C1.3.1.1. The results of any reference-hearing test are recorded on DD 2215. The original reference audiogram form, as well as all subsequent audiograms, will be retained permanently in the individual's health record. Three types of reference audiograms are used in the HCP:

C1.3.1.2. An original reference (baseline) audiogram is administered prior to initial work assignment in occupational noise exposure. This test remains the baseline as long as the employee maintains Federal service. If there is a break in service or reassignment away from hazardous noise, the employee receives a termination audiogram and a new reference upon re-employment or reassignment. An original reference (Baseline) audiogram is performed prior to hazardous noise exposure while in Federal employment and follows as the Baseline as long as there is no break in service. In the case of civilians transferring between major command and components (e.g., worker employed by the Army transfers to Navy employment) the baseline remains the same.

C1.3.1.3. In some instances, a reference audiogram is administered after exposure to hazardous noise, such as when the original reference audiogram was lost, or was never established.

C1.3.1.4. A Re-established Reference audiogram is administered as the result of a follow-up program.

C1.3.1.4.1. Monitoring Hearing Tests. Monitoring hearing tests are used to detect incremental changes in hearing and identify potential problems before the individual experiences hearing loss that interferes with verbal communications. Detection is made by comparing the most current monitoring audiogram with the reference audiogram to determine significant changes in hearing. The annual monitoring hearing test may be conducted at any time during the work shift. The results are recorded on a DD 2216 and retained permanently in the individual's health record. When a retest is required due to a significant change in hearing, it is important that the individual be evaluated in a timely manner. The DD 2216 monitoring sequence should be completed within two weeks, and cannot exceed 30 days to be considered valid. If follow-up testing is not obtained within 30 days, the sequence starts over.

NOTE: Personnel to be monitored should be instructed to bring their personal hearing protectors to the test site in order to verify fit and effectiveness.

C1.3.1.4.2. Termination Hearing Tests. All military personnel will receive a hearing test upon termination of Navy service regardless of assignment or exposure to hazardous noise. Civilian personnel who have been routinely exposed to hazardous noise and were enrolled in the HCP will receive a hearing test within 30 days preceding termination of employment. If civilian personnel decline a separation/termination audiogram then they will sign a statement indicating their refusal. Additionally, all civilian personnel who no longer require inclusion in the HCP due to removal from hazardous noise duties will have a hearing test to document auditory status at the time of reassignment. Results of termination/removal hearing tests are recorded on DD 2216 forms.

C1.3.1.4.3. Significant Threshold Shifts (STS). An STS is defined as a change in hearing threshold relative to the current reference audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz, in either ear. A change of 15 dB or greater in either ear at any test frequency from 1000 to 4000 Hz

will be considered an early warning of potential future STS, requiring verbal counseling and assurance of appropriate hearing protection for the individual. The STS may be either positive (poorer hearing) or negative (better hearing). Action should be taken as follows:

C1.3.1.4.3.1. If the STS is negative, that is, the hearing levels of the monitoring audiogram are better than the reference audiogram, then either the reference audiogram or the monitoring audiogram may be in error. In order to determine which is the case, a retest should be conducted on the same day if possible. Based upon the results of this retest, the following action will be taken:

C1.3.1.4.3.2. If the results of the retest (follow-up 1) are not significantly different from the reference audiogram (meaning no STS is present); it is assumed that the annual monitoring audiogram was in error. No further testing is required. The individual should be counseled on the test results and return in 12 months for the next annual test (if enrolled in the HCP).

C1.3.1.4.3.3. If the results of the retest remain significantly improved from the reference audiogram, it is assumed that the reference audiogram is in error. Establish the retest as the new Reestablished Reference audiogram, category 3 on DD 2215. No consult is needed.

C1.3.1.4.3.4. If the STS is positive, that is, the hearing levels of the monitoring audiogram are poorer than the reference audiogram, a 14-hour noise-free follow-up test must be administered on a subsequent day to determine if the decrease in hearing is permanent. The supervisor should be notified of the date, time, and reason for the follow-up test(s).

C1.3.1.4.3.5. If the results of this first follow-up test do not indicate an STS, no additional follow-up testing is required and the individual may be counseled and returned to annual monitoring.

C1.3.1.4.3.6. If positive STS persists on the first follow-up and if frequencies below 3000 Hz are involved, then it is efficient and necessary to rule out an obvious conductive (mechanical) or medically significant basis for the shift before proceeding to the second follow-up. The preferred method to rule out conductive hearing loss is through otoscopy and

technician-administered screening tympanometry. Normal otoscopy, in conjunction with a normal tympanogram, is a quick and accurate indication that the threshold shift was not the result of an acute medical condition. A health record SF600 entry is made to document the tympanometric and otoscopic findings. A copy of the tympanogram printout (if provided) should be attached/scanned to the SF600. If the tympanogram is abnormal, then evaluation by a health care provider (medical officer, nurse practitioner, physician's assistant, or independent duty corpsman) must be obtained and documented and the individual followed until cleared medically. If instrumentation is not available, guidance concerning local procedures will be provided by the audiologist or physician responsible for case management.

C1.3.1.4.3.7. Perform a second follow-up audiogram If tympanometry/otoscopy and/or medical evaluations are within normal limits. This follow-up test may be administered on the same day as the first follow-up. If the STS persists on the second follow-up, the hearing protection is evaluated / refit and the results are forwarded to an audiologist or qualified physician for review and disposition. The audiologist or qualified physician may elect to provide a specific written referral protocol for disposition of individuals who do not require additional follow-up. A sample protocol, which may assist in developing local guidelines, is provided in Appendix E. The results of the second follow-up test are typically used to create a re-established reference audiogram. If the second follow-up differs significantly from the first follow-up, it is unreliable, and then the consulting audiologist or appropriate physician will provide direction.

C1.3.1.5. For individuals exhibiting a positive STS, their supervisor must be notified in writing within 21 days of a positive STS. A sample letter is provided as Appendix E.

C1.3.2. Permanent Threshold Shift (PTS). A PTS toward poorer hearing is a potentially recordable illness or injury and is reported to the OSH office for entry on OPNAV 5102/7 (Log of Navy Injuries and Occupational Illnesses), or equivalent. In addition, all monitoring results are reviewed for evidence of an "OSHA-Recordable" STS. This is defined as a 10 dB average shift at the frequencies 2000, 3000, and 4000 Hz in either ear, and when the Hearing Threshold Level at these frequencies exceeds 25 dB when compared to the Baseline/Reference audiogram. Both of these circumstances require written notification to the worker within 21 days (patient's signature on the 2216 will suffice as an appropriate notice). When notifying the OSH office/commanding officer of a PTS occurrence, action must be

taken to prevent further hearing loss. These actions may include evaluation of the work-site, determining adequacy of hearing protectors, and ensuring that hearing protectors are being used properly. A hearing loss that occurs from an instantaneous event e.g., acoustic trauma from an overpressure, shall be recorded as an "injury" on the appropriate injury log.

C1.3.3. Additional Referral Criteria

C1.3.3.1. Individuals in the Hearing Conservation Program who meet the following criteria may be classified according to a Hearing Profile (H-1 through H-4) to assist in disposition recommendations.

C1.3.3.1.1. H-1 Profile. This is unaided hearing loss in either ear with no single value greater than:

| Hz: | 500 | 1000 | 2000 | 3000 | 4000 | 6000 |
|---|---|---|---|---|---|---|
| dB: | 25 | 25 | 25 | 35 | 45 | 45 |

Without specific complaint or problem, no follow-up required.

C1.3.3.1.2. H-2 Profile. The H-2 profile requires a referral to a medical officer who will, whenever possible, refer them to an audiologist or otolaryngologist when H-2 levels are met or exceeded. Definition: Unaided hearing loss in either ear with no single value greater than:

| Hz: | 500 | 1000 | 2000 | 3000 | 4000 | 6000 |
|---|---|---|---|---|---|---|
| dB: | 35 | 35 | 35 | 45 | 55 | --- |

C1.3.3.1.3. H-3 Profile. The H-3 profile is disqualifying. It requires evaluation and waiver, and an Audiology Fitness for Duty evaluation to determine eligibility for continued employment in hazardous noise. (See Appendix G for guidance on fitness for duty) Definition: An H-3 profile is any loss that exceeds the values noted above in the definition of an H-2 profile.

C1.3.3.1.4. H-4 Profile. Hearing loss sufficient to preclude safe and effective performance of duty, regardless of degree of pure tone hearing loss, or unknown hearing loss values. The H-4 profile indicates an incomplete follow-up or a requirement for a Medical Evaluation Board.

C1.3.3.2. Individuals whose hearing thresholds at any test frequency differ by 40 dB or more between ears cannot be tested at the technician level, and must be referred to an audiologist.

C1.3.3.3. Otolaryngology referral is indicated for individuals not responding to treatment of ear canal occlusion, persistent ear pain, or drainage from the ear canal. Significant aural pathology, dizziness, severe and persistent or unilateral tinnitus, or sudden onset of hearing loss warrants immediate otolaryngology consultation.

C1.3.3.4. Personnel who experience any occupational illness or injury, such as hearing loss, tinnitus or difficulty understanding verbal communication should report these problems to their immediate supervisor.

C1.3.4. Exclusion From Future Noise Exposure. Individuals who exhibit a progressive series of PTSs must be considered to be at high risk for developing further hearing loss. Accordingly, such personnel must be given special consideration under the HCP.

C1.3.4.1. Individuals monitored under the HCP who have their reference audiogram re-established due to deteriorated hearing on three separate occasions must obtain clearance from an audiologist, otolaryngologist, or occupational medicine physician before returning to duties involving hazardous noise.

C1.3.4.2. Any individual who has hearing loss in both ears in which the sum of thresholds at the frequencies of 3000, 4000, and 6000 Hz exceeds a sum total of 270 dB will not be assigned to duties involving exposure to hazardous noise without a Fitness for Duty evaluation and clearance as described above.

C1.3.4.3. If such clearance is inappropriate, the audiologist or physician evaluating the individual will make specific recommendations to the individual's command. These may include the advisability of restriction from noise hazardous work, appropriate placement of the worker, or the need for stricter enforcement of hearing protection policies.

C1.3.5. Evaluation of Audiometry. The provision of audiometry and other hearing conservation support services will be accomplished under the supervision of an audiologist, otolaryngologist, occupational medicine physician, or other qualified physician.

C1.3.5.1. Technician proficiency in test instructions, administration, and fitting of hearing protective devices will be evaluated and documented at least annually as part of the re-certification process. Annual in-service training is recommended.

C1.4. Hearing Protective Devices (HPDs). HPDs and earplug carrying cases are provided to and worn by personnel working in potentially hazardous noise in accordance with references (b) or (c). It is Navy Occupational Safety and Health (OSH) policy that personnel exposed to sound levels 85 dB(A) or above or 140 dB peak or above wear HPDs regardless of duration of exposure. Application of this policy should be based on sound professional judgment. Provision of personal hearing protection of any sort requires basic instruction as to use and care. Pre-formed disposable earplugs should be available at all times for personnel in the Hearing Conservation Program, and hand formed disposable earplugs must be available for visitors to noise-hazardous areas. Purchase and provision of hearing protection is a requirement of the individual's activity. Hearing protection and earplug carrying cases are considered safety supply items, not medical items. The earplug carrying case may be worn by active duty personnel as a part of the military uniform while working in noise-hazardous areas. It may be worn on the left front shirt pocket, hanging from the innermost button, or from the first or second belt loop on the right side. Personnel who are not in compliance with the mandatory and appropriate use of hearing protection in noise-hazardous areas (double protection where required) are subject to administrative or disciplinary action.

C1.4.1. Fitting Procedures. While the command or activity is required to purchase, provide and maintain hearing protection for its employees, non-disposable hearing protectors require sizing and fitting by medically trained personnel. Before any such device is placed in an ear, a well-lighted visual inspection is necessary to determine whether any condition is present that would make insertion inadvisable, e.g., observable pathology or excessive earwax. Each ear canal will be sized separately. An earplug carrying case, Navy Blue Earplug Inserter-Case (NSN 6515-01-533-6168), Olive Drab Earplug Inserter-Case (NSN 6515-01-100-1674), or Cylindrical Earplug Case (NSN 6515-01-212-9452) is also to be provided at no cost. This case may also be used for disposable earplugs. All personnel required to wear hearing protection will receive adequate and effective training in the proper use and care of hearing protective devices. Medically trained personnel must examine the fit and condition of preformed and custom earplugs at least annually, preferably in conjunction with the annual hearing test.

C1.4.2. Hearing Protector Selection. Information and guidance on noise reduction ratings (NRRs), price, ordering information, custom molded hearing protection and other features

concerning hearing protection devices may be found at http://www-nehc.med.navy.mil/occmed/aud_HearingProtection.htm. The user should be permitted some freedom of choice in the selection of available hearing protective device unless the selected protector is medically contraindicated or inappropriate for a particular noise hazardous area or operation. Audiologic consultation is recommended in instances of significant pre-existing hearing loss, high intensity noise (TWA's in excess of 104 dB(A) or 165 dBP impulse/impact), fitness for duty evaluation or communication-critical situations.

C1.4.2.1. The Navy does not conduct testing of HPDs, however, a listing of products that have been evaluated by DoD or other approved labs is available from a variety of sources:

http://www.cdc.gov/niosh/topics/noise/hpcomp.html;
http://chppm-www.apgea.army.mil/hcp/devices.aspx;
https://kx.afms.mil/ctb/groups/dotmil/documents/afms/ctb_044610.pdf

C1.4.2.2. Please consult Appendix F and ensure the following steps are followed when selecting HPDs:

C1.4.2.2.1. Ensure that Industrial Hygiene, Safety, and Occupational Audiology are cognizant of the need and document special circumstances for deviating from hearing protectors that may not have been evaluated by a Government lab.

C1.4.2.2.2. Coordinate with the regional Occupational Audiologist the selection of alternative product(s) to assure appropriate NRR values;

* NRR values are not necessarily representative of real world attenuation.

C1.4.2.2.3. Purchase a small quantity of the product for a limited trial of comfort, durability, protectiveness (monitor STS rates on the subjects using the protector) and user acceptance;

** Verifying label attenuation claims may be necessary.

C1.4.2.2.4. Forward any questions concerning of process to the NMCPHC Audiology Team.

C1.4.2.3. Considerations of Product Data. Remember, when investigating any hearing protection product assure they have been evaluated by an approved laboratory. An approved lab is defined as one that meets general industry accreditation

standards and is not affiliated with a manufacturer or product. Octave band Real Ear Attenuation at Threshold (REAT) results should be available that provides the NRR value. A more conservative estimate of a protector's attenuation is the "SF" (subject fit) NRR.

C1.4.2.4. Devices used for recreational listening, such as "noise muffs" with built in radios, or "ear buds" must not be used in place of or in conjunction with approved hearing protectors. To hear a desired signal while in noise, the signal must be of greater intensity than the background noise. In some situations this may result in the signal reaching hazardous levels. The radio signal would add to the over-exposure and may also pose a safety hazard by further isolating the listener from his/her environment. In addition, hearing aids must not be used in place of or in conjunction with an approved hearing protector unless approved for that purpose by an audiologist or otolaryngologist.

C1.4.2.5. Custom Molded Hearing Protectors. Personnel may use custom earplugs when special circumstances or their job requires a custom hearing protector or communication enhancement device, or if they cannot be properly fitted with other approved commercial-off-the-shelf hearing protectors. Custom earplugs must have effective noise reduction capability to reduce the noise exposure to acceptable limits. Flight line, flight deck operation areas and personnel exposed to extreme hazardous noise, and personnel who use communication devices during noise hazardous operations have the option to use custom hearing protection to effectively reduce excessive noise exposure and maintain and/or enhance communication ability. Only audiologists, otolaryngologists, or trained technicians (which may include AMSE and AMSO personnel) may take impressions of the ear necessary to make the custom earplugs. The protocols for taking custom mold impressions and for the most current guidance please consult:
http://www-nmcphc.med.navy.mil/occmed/index_audiology.htm. As always, funding for hearing protection is the responsibility of the unit, shop, command or activity supply department. Preformed or custom molded musician's earplugs will be provided to Service band members.

C1.4.3. Administrative Control of Exposure. Administrative control of exposure time will be necessary in cases where hearing protective devices do not provide sufficient attenuation to reduce the employee's effective exposure level to less than an 8-hour TWA of 85 dB(A).

C1.5. Education. Other than successful noise abatement operations, nothing is more important to the successful prevention of noise induced hearing loss than motivating personnel to wear hearing protectors appropriately and ensuring compliance with personal protective and surveillance requirements. Personnel must know why they need to protect themselves, when and how to do so, and the consequences of carelessness or deliberate non-compliance. Successful education at all levels of command is vital.

C1.5.1. Initial hearing conservation training must be given prior to assignment to duties in hazardous noise. Civilians enrolled in the Hearing Conservation Program should obtain this training from the command during an orientation module. Uniformed personnel should obtain initial education during basic training. Training must be documented on the baseline/reference audiogram or elsewhere in the individual health record. Upon reporting to duties involving exposure to hazardous noise a health record review is necessary to ensure that training and documentation of training has occurred. Initial training should be sufficiently comprehensive to ensure familiarity with the following training elements:

C1.5.1.1. The physical and psychological effects of noise environments and hearing loss;

C1.5.1.2. Recognition of posted and unposted noise-hazardous spaces and equipment;

C1.5.1.3. Audiometric testing and its purpose;

C1.5.1.4. The proper selection, fitting, use and care of HPDs;

C1.5.1.5. The responsibilities of both supervisors and employees in the prevention of hearing loss;

C1.5.1.6. Awareness training as to the hazards of non-occupational noise exposure during recreational activities;

C1.5.1.7. Impact of hearing loss on job performance and fitness for duty.

C1.5.2. Support for refresher training may be obtained from Medical Department personnel. This training may be more effective or efficient when provided in conjunction with the annual monitoring audiogram. Training when provided by Medical will be documented on the DD2216. In addition, when the

training is provided by Medical, documentation of training must be forwarded to the command/activity. While content and duration of training are not specified, effectiveness of initial and refresher training should be documented via follow-up survey or other means.

C1.5.3. Sources for hearing conservation training materials and information may be found at: http://www-nmcphc.med.navy.mil/occmed/index_audiology.htm. In addition, the Occupational Audiology Team may be reached at (757) 953-0773/0772/0760 DSN 377-0773/0772/0760. Additional sources of information are the occupational health offices at Navy MTFs. HCP training should be customized for local needs but a generic lesson may be accessed via Navy Knowledge Online (https://wwwa.nko.navy.mil/portal/splash/index.jsp). After login go to: "Navy e-learning" then click on "Advanced Search" then type in "Hearing Conservation" in the course title box." Sources for hearing conservation training materials and information include the NMCPHC Occupational Audiology Team at Navy and Marine Corps Public Health Center's Hearing Conservation/Audiology Team at DSN 377-0772/0773, commercial (757) 953-0772/0773 or e-mail hearing@nehc.mar.med.navy.mil. Additional sources of information are the occupational health offices at Navy MTFs, and Navy Environmental and Preventive Medicine Units. HCP training should be patterned to local needs, therefore a lesson plan is not offered as part of this manual.

C1.6. Record Keeping Requirements

C1.6.1. Hearing Conservation Data

C1.6.1.1 All hearing conservation data will be recorded using the following forms:

C1.6.1.1.1. DD 2215, Reference Audiogram
C1.6.1.1.2. DD 2216, Hearing Conservation Data
C1.6.1.1.3. DD 2217, Audiometer Biological Calibration Check
C1.6.1.1.4. NEHC 5100/17, Industrial Hygiene Noise Survey Form
C1.6.1.1.5. NEHC 5100/18, Industrial Hygiene Noise Dosimetry Form

C1.6.1.2. Disposition of completed DD 2215 and DD 2216 data forms is as follows:

C1.6.1.2.1. A hard copy/print-out is to be placed in the individual's health record.

C1.6.1.2.2. Commands will export (upload) to the DOEHRS Data Repository at least weekly. Daily uploads are highly recommended. Information concerning exporting data may be obtained at the following web site:

https://dohrswww.apgea.army.mil/occHealthPortal/. Information concerning the DOEHRS Data Repository may be found at: https://dohrswww.apgea.army.mil/dohrsdr/index.cfm.

C1.6.1.2.3. An electronic copy must be retained in a local/regional database for evaluating program compliance.

C1.6.2. Employee Health Record. The health record of each individual identified by command for inclusion in the HCP will contain the following:

C1.6.2.1. Original baseline/reference audiogram (DD 2215).

C1.6.2.2. Re-established reference audiogram(s), if different from original baseline audiogram (DD 2215).

C1.6.2.3. All monitoring audiograms (DD 2216).

C1.6.2.4. Individual Noise Exposure. Documentation of exposure may be based on actual exposure or SEG (Similar Exposure Group) data associated with the individual's job code (NEC, MOS, SDOC) and may not be readily available in the medical file. If individual documentation of noise exposure, e.g. dosimetry, has been done, documentation is to be filed in the medical record. Avoid selection of a specific noise exposure choice on the DD 2215/2216 without documentation of the actual exposure.

C1.6.2.5. Documentation of initial training and documentation of refresher training when provided in conjunction with the annual audiogram.

C1.6.2.6. All clinical evaluation and case management documentation provided in response to medical surveillance findings.

C1.6.3. Medical Department Documentation. The following records are maintained:

C1.6.3.1. Current roster of exposed employees, as provided by the supported commands. This roster will be updated at least semi-annually.

C1.6.3.2. Results of noise surveys. (survey data for individual commands may not be available.)

C1.6.3.3. Results of daily Audiometer Biological Calibration Check (DD 2217).

C1.6.3.4. Results of annual audiometric chamber certification.

C1.6.3.5. Records of proficiency evaluation and in-service training of audiometric technicians.

C1.6.4. Retention of Records

C1.6.4.1. Results of hearing tests performed for hearing conservation, as well as exposure documentation, will be a permanent part of an individual's health record.

C1.6.4.2. Noise exposure data, recorded on a DD 2214, NEHC 5100/17, or 5100/18, will be kept for a minimum of 40 years.

C1.6.4.3. All other documentation will be retained for five years.

C1.7. Program Performance Evaluation. Early detection of changes in hearing allows action to be taken to prevent further hearing loss. Although each hearing testing MTF facility is required to maintain a hearing conservation database for assessing the effectiveness of the HCP, it is the responsibility of the individual commands being served to provide denominator data to that test facility. Ongoing communication and collaboration between the commands of personnel enrolled in the HCP and the HCP Manager is crucial in order to evaluate HCP effectiveness and work toward the common goal of hearing loss prevention. The manager will monitor program effectiveness of all supported activities, and at least annually provide program performance evaluations to supported activities based on the following measures. This information is to be maintained for inspections, audits, or epidemiological trending.

C1.7.1. Compliance. This statistic reports the number of individuals enrolled in the HCP who have a current audiogram (date within 12 months) divided by the number of individuals enrolled. Issues: No control over # of individuals that

actually report for testing. In transient or multiple commands program administration may not know the full compliment that should be tested. The statistic is: # in HCP with current audiogram X 100 = % compliance # in HCP.

C1.7.2. Incidence of STS. This statistic reports the number of positive STSs (poorer hearing) at annual monitoring (not counting follow-up exams for the same individual) in the latest fiscal year, divided by the number of individuals monitored. The statistic is: # of STS detected X 100 = % incidence STS # monitored.

C1.7.3. Incidence of PTS. This statistic reports the number of PTSs (poorer hearing) in the latest fiscal year divided by the number of individuals monitored during that period. The statistic is: # PTS detected X 100 = incidence PTS # monitored.

C1.7.4. The DOEHRS Data Repository (DR) offers both standard and ad hoc queries against all centrally maintained data. Guidance in utilizing the DR is provided in Appendix J. Additional guidance may be obtained by contacting the Occupational Audiology Team at NMCPHC.

# AUDIOMETRIC TEST BOOTH CERTIFICATION

Command Owning Booth: _____ Date Measurements Were Made: _____

Audiometric Test Booth Data

Booth Location:

Significant Operating Conditions:

| OBA/SLM Data | Microphone Data | Octave Band Filter Calibration Data (If separate) |
|---|---|---|
| Manufacturer: | Manufacturer: | Manufacturer: |
| Model#: | Model#: | Model |
| Serial#: | Serial#: | Serial#: |
| Elec/Acoust Cal: | Elec/Acoust Cal: | Elec/Acoust Cal: |

Field Pre-Cal OK? __Yes __No Field Post-Cal OK? __Yes __No

**Field Measurements**

| Octave Band Center Frequency (Hz) | Max SPL for All Tests (dB) | Octave Band SPL Inside Booth (dB) | Octave Band SPL Outside Booth (dB) |
|---|---|---|---|
| 500* | 27 | | |
| 1000 | 29 | | |
| 2000 | 34 | | |
| 4000 | 39 | | |
| 8000 | 41 | | |

* Level required for certification for medical surveillance testing. Refer to ANSI S3.1 for clinical booths.

This booth __**Is** __**Is Not** certified for audiometric testing (Check one) Comments:

_____ _____
Printed Name of Certifier Signature of Certifier

Certifier's Command: _____ Date:_____

**APPENDIX B**

# FIELD GUIDE TO AUDIOMETRIC TEST BOOTH CERTIFICATION

Ref: (a) OPNAVINST 5100.23 series, Chapter 18 (NAVOSH ASHORE)
(b) OPNAVINST 5100.19 series, Chapter B4 series (NAVOSH AFLOAT)
(c) NEHC Technical Manual TM 6260.51.99 series, "Navy Medical Department Hearing Conservation Procedures"
(d) ANSI S3.1 Current Version, "Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms"

Encl: (1) Audiometric Test Booth Certification (Medical Surveillance)
(2) Clinical Audiometric Test Booth Certification (ears uncovered)
(3) Clinical Audiometric Test Booth Certification (ears covered)

## Introduction

This field guide provides a recommended protocol to certify audiometric test booths/rooms/chambers. It presumes that the user is an audiologist, industrial hygienist, or technician working under direct supervision of one of these professionals. No other circumstance is permissible. Readers who are not familiar with basic operation of a precision sound level meter (SLM) should receive preparatory training beyond the level of this field guide before attempting booth certification. Protocols are given for both medical surveillance purposes and for clinical audiometric testing. Note that clinical standards are far more stringent than NAVOSH medical surveillance standards. The protocol described here has been incorporated into the Industrial Hygiene Field Operating Manual (IH FOM), which can be downloaded from http://www-nmcphc.med.navy.mil /ih/infom.htm. **Finally, remember the principle that all audiometric booths are sound-treated, not sound-proofed**!

## Instrumentation

Booth certification requires a Type I precision SLM with attached octave band analyzer (OBA) and capability to record down to at least 10dB SPL in slow response mode. Your SLM, OBA, microphone, and calibrator must each have been professionally calibrated within one year. The IH FOM provides guidance.

**Basic Procedures**

1. Conduct the certification during external noise/activity conditions that are representative of anticipated test conditions. That also applies to internal conditions (overhead fan, lights). Document those conditions on the certification form.

2. Perform pre and post-calibration of the SLM as described in the Instrument Operating Manual. Document make/model and calibration dates on the certification form.

3. Take recordings at the location of the patient's head, with the SLM held away from your body.

4. Select the desired octave band, dial in slow response, and take your reading. Record results for each required octave band. NOTE: Octave band reading must be done on the "All Pass" setting. Significant errors occur if the "A" weighting network is engaged.

5. For multiple station booths, check levels at seats closest and farthest from the door, and record the higher of the two sets of values.

6. Record external levels for information value only. Levels will typically be quite variable, so you may prefer to simply record typical dB(A) and dBC levels.

7. At some point during the process, have someone talk outside the booth to see if the booth is certifiable under that condition. **Experience has shown that the most troublesome external noise source is a chatty audiometric technician.** If external conversation precludes valid testing, be sure to annotate that fact on the certification form. This will often be the case with single-wall booths.

8. Record all values; complete and post the certification on the exterior of the booth or on an adjacent wall. Keep a copy for your files.

**Medical Surveillance**

References (a) and (b) describe OSH responsibilities for Shore and Afloat commands, respectively. Each instruction refers to reference (c) for specific guidance in Medical Department aspects/responsibilities for the Hearing Conservation Program (HCP).

Appendix A is a medical surveillance booth certification form, with allowable background noise levels annotated.

**Periodicity**

All audio booths require, at minimum, annual certification (365 day interval). A booth is certified for use during the exterior and interior conditions which prevailed at the time of certification. For example, a shipboard booth that has been certified pier-side cannot be utilized underway until it has been evaluated under representative underway conditions. Similarly, a booth must be re-certified if a fan becomes noisy, a persistent new exterior noise source is added, if the booth is re-located, or if there is any change in environment that has the potential to affect test results (i.e. results in interior ambient noise levels in excess of the allowable).

**Mobile Hearing Conservation Audiometric Trailers/Vehicles**

(MOHCATs/MOHCAVs) are a special situation. As mentioned above, a MOHCAT or MOHCAV booth requires annual certification the same as stationary booths. This is best accomplished in the location most often used (your major customer). If testing is to be conducted with on-board generators supplying power, then certification should be duplicated under that condition.

Re-certification is also required whenever external conditions change - such as moving to a new location. It may not be practical to conduct a formal booth re-certification after each move, particularly for short-term/frequent deployments. The current model MOHCAVs was designed to incorporate a second wall of attenuation in the form of the body of the vehicle, and this works fairly well. However, noise sources such as cross-traffic, generators, flyovers, and small crafts pier-side all have the potential to invalidate test results. Here are two alternatives to formal recertification, which will ensure test validity:

1) Conduct and document booth certification at each prospective test location, under worst-case test conditions. You need not repeat the certification for subsequent deployments to the same location.

2) When this is not feasible, a second option is to conduct a "biological" certification at a new test location prior to seeing patients.

Conduct and retain an audiogram on a normal hearing listener to

demonstrate a certifiable test at 1000 Hz and above. This could be called the "Golden Ear" method. Assuming good hearing sensitivity by the listener, ambient noise should permit thresholds 0-5dB at 500 Hz, and 0dB.

A knowledgeable and conscientious audiometric technician will pause the test when some noisy, transitory external event is occurring. Single-wall booths may not adequately attenuate an F-18 flyover or someone walking by with a boom box turned to maximum volume.

**Clinical Audiometric Testing**

Reference (d) describes the maximum permissible ambient noise levels (MPANLs) within a clinical audiometric test booth. MPANLs vary with test format, such as ears uncovered or covered, the frequency range to be tested, and whether the sound sampling strategy included octave band or one-third octave band measurements. This field guide presumes octave band SLM measurements and clinical pure tone testing in a frequency range of 250 to 8000 Hz.

**Troubleshooting**

1. If a booth will not certify in low frequencies, re-check ambient levels with the fan turned off. If fan noise is determined to be the problem, then initiate repair immediately. Replacement of the fan is typically required, as most of them are sealed units with no first echelon maintenance. It is poor customer service to use a booth with an inoperable fan, whether you are in Keflavik or Key West.

2. Electrical lighting will occasionally be a source for low frequency noise in the form of 60-cycle hum, with harmonics migrating into the 500 Hz test range. This can be corrected. Do not make your customers sit in a dark room to take their hearing tests. It is unprofessional and encourages napping.

3. Door seal problems are common after several years of use. The seals harden, wear out, and must be replaced. Sometimes the door has been improperly hung, or develops a problem and must be shimmed carefully. A properly hung door will slowly swing shut by itself. Make certain the door is shut tight and securely latched. A properly sealed door will offer light resistance to a dollar bill that is pulled through the seal anywhere along the periphery.

4. The jack panel is a recurring source for ambient noise interference. Steps must be taken to isolate sounds from passing through any opening such as where headphone and hand switches enter. The jack panel is also a good place to start when troubleshooting intermittent biological calibration difficulty. Biomedical repair personnel should be contacted to do continuity checks and clean/replace jacks and plugs as needed.

5. If the above actions do not adequately reduce ambient noise, options include removing/relocating external noise sources, relocating your booth, adding vibration dampers aboard ship (no simple task; talk to NAVSEA), or look for a replacement. Life cycle for an audio booth is largely dependent on the number of times it has been moved. More than two or three take down/reassemble evolutions render most booths not worth the trouble. A reasonable life cycle for a stationary booth is 15 to 20 years, assuming routine maintenance of door seals and fans.

6. Plan on a double-wall booth in high traffic areas, aviation environments, or aboard ship. Remember that even a single-wall 1-person booth weighs 1800-2000 pounds, and a double-wall weighs (and costs) about twice as much. Consult an engineer to confirm that the floor can support the total weight of your booth and patient(s) in the selected location. For shipboard use, the booth must be securely fastened to prevent sliding in rough seas. This is often done by welding the booth to the deck. Great care must be taken when doing this to ensure the spring mounted interior booth is not affected, thereby defeating the effectiveness of a double wall booth.

7. Finally, internal noise sources can be as problematic as external noise. Chairs or stools should be of sturdy metal construction that will not squeak, such as prison industries types. Curtains between multiple test stations will muffle sound and inhibit distractions. Carpeting or rubber mats further dampen noise.

**For Further Information or Assistance**

Contact your area/regional audiologist or industrial hygienist for further assistance, or contact the Navy and Marine Corps Public Health Center's Hearing Conservation/Audiology Team at DSN 377-0772/0773/760, commercial (757) 953-0772/0773/0760, or e-mail hearing@nehc.mar.med.navy.mil.

APPENDIX C

# MAINTENANCE AND DOCUMENTATION OF HEARING CONSERVATION TECHNICIAN PROFICIENCY

## I. INTRODUCTION.

This short paper outlines a protocol to ensure annual maintenance and documentation of hearing conservation technician (HCT) proficiency. It should be useful for both direct and technical supervisors of HCTs. Per DoDI 6055.12, "A technician who performs audiometric tests shall be responsible to an audiologist, otolaryngologist, or other physician." Immediate supervisors who are neither audiologists nor appropriately trained physicians are advised to consult with these specialists to ensure compliance and effectiveness.

Navy HCTs complete an intensive 4 or 5 day training and certification program which prepares them to work independently and effectively. They are then re-certified within 5 years after refresher training. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has no specific guidelines for ensuring technician proficiency. JCAHO defers to the discipline-specific supervising body, for instance the Council for Accreditation in Occupational Hearing Conservation (CAOHC) and applicable military organizations such as the NMCPHC, to prescribe the appropriate interval and method to maintain /document proficiency. Although many hearing conservation program (HCP) managers already have some sort of HCT proficiency maintenance protocol, the practice is not universal. Here are some reasons why it should be: A properly trained, motivated, and equipped HCT is the cornerstone of every HCP.

There is a significant on-the-job learning component to HCT training. It is not uncommon for HCTs to receive their first HCP work assignment several months after being certified. Many HCTs, particularly in the Navy, work with minimal technical supervision.

Anyone who is the direct or technical supervisor of an HCT, or who signs their training certificate, puts his or her reputation on the line every time the HCT conducts a hearing test and determines appropriate disposition. There is a significant on-the-job learning component to HCT training. It is not uncommon for HCTs to receive their first HCP work assignment several months after being certified. Many HCTs, particularly in the Navy, work with minimal technical supervision.

## II. DOCUMENTATION OF PROFICIENCY.

Whenever possible, proficiency evaluation should be accomplished at the technician's work site. The entire procedure need take no more than an hour, and should be accomplished at least annually. The procedures and checklist provided here are neither exhaustive nor necessarily the optimum format for proficiency review, but they are a starting point.

A checklist that may be utilized and retained as documentation of proficiency review is included in this appendix. Four basic areas of performance review are identified: administration of hearing tests, record keeping, fitting of personal hearing protection, education/motivation.

### ADMINISTRATION OF HEARING TESTS

Direct observation of a complete patient contact is advised in order to observe status of instrumentation, instructions and patient contact skills, test technique, patient counseling, and disposition. The reviewer may also serve as the patient. At least one manual test should be observed, or administered to the reviewer, in addition to microprocessor testing. Administration and interpretation of tympanometry should be assessed, if applicable. Note that the checklist assumes an expert reviewer, and does not "break down" the components of a procedure.

### RECORD KEEPING/FORMS

This review begins with a quick scan of the unit Standard Operating Procedure, Local Operating Manual, and/or Desk Guide. Briefly review DD2217s, listening check sheets, command rosters, and documentation of workload. Regarding DD2215/2216 forms, pulling health records vice review of forms in isolation allows observation of SF513 consults, SF600 entries, and form placement in the record. No minimum sample size is specified, but the reviewer should note the number or approximate percentage of records or forms sampled. Again, the enclosed checklist may be used.

### FITTING HEARING PROTECTIVE DEVICES (HPDs)

Confirm an adequate stock of HPDs and a functioning otoscope. Observe an actual fitting, or have the HCT fit you with one or more types of HPDs. Complete the checklist.

EDUCATION/MOTIVATION

Technicians who have a significant training role should be observed while conducting training. Where that is impractical, the checklist suggests a format to assess preparation (if not competency) in that role.

III. MAINTAINING PROFICIENCY THROUGH IN-SERVICE TRAINING.

Create a schedule of in-service dates and topics to keep technicians interested and supervisors involved. For remote sites, training may be administered over the internet, through videotape, or in written format with a few test questions to confirm participation and understanding. Case studies are easy, fun, and informative for trainer and trainee. A pre-test can stimulate interest and identify training deficiencies.

Technician/cert #: Location: Date:

HEARING CONSERVATION TECHNICIAN PROFICIENCY CHECKLIST

(check-mark = observed/ok 1 = see comment #1 blank = not observed)

1. Test administration:

___ Instrumentation calibrated/functional
___ Instructions
___ Patient prep/seating
___ Microprocessor technique
___ Manual technique
___ Patient counseling
___ Disposition
___ Tympanometry

Comments:

Record keeping/forms: (Average monthly workload _____)

___ SOP
___ Current instruction(s) available
___ DD2217s
___ Listening checks
___ Workload documentation
___ Command rosters
___ DD2216s (____ reviewed, ____ errors noted) # health records Pulled _____
___ DD2215s (____ reviewed, ____ errors noted)

Comments:

Fitting HPDs:

___ Adequate stock
___ Otoscopy
___ Fitting technique
___ counseling Comments:

4. Education/Motivation of clients:

___ Training observed for delivery, content, overall effectiveness
___ Not observed, but training effectiveness documented through surveys Comments:

5. Summary, including refresher training requirements:

Reviewer: _____

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# APPENDIX D

Memorandum

From: Operational Audiology Officer, NH xxxxxxx
To: Hearing Conservation Technicians and Other Medical Surveillance Personnel Supported by the Naval Hospital XXXXXXXXXXXXX
Subj: AUDIOLOGY REFERRAL GUIDELINES FOR NORMAL HEARING PATIENTS DEMONSTRATING SIGNIFICANT THRESHOLD SHIFT

Ref: (a) OPNAVINST 5100.19 series, NAVOSH AFLOAT, CH B4
(b) OPNAVINST 5100.23 series, NAVOSH ASHORE, CH 18

1. This memorandum provides referral guidelines to be followed by Hearing Conservation Technicians and other Occupational Health personnel requesting operational and occupational audiology support from Naval Hospital xxxxxxxx. References (a) and (b) describe the Hearing Conservation Program (HCP) for Forces Afloat and Ashore, respectively. A key component of the HCP is monitoring audiometry, which is provided for early detection of occupationally noise induced hearing threshold shift. Upon demonstrating a Significant Threshold Shift (STS) that is persistent through follow-up testing, monitored personnel require evaluation by an audiologist or appropriately trained physician, such as an Occupational Medicine Physician, Flight Surgeon, or Otolaryngologist.

2. References (a) and (b) allow the audiologist or physician who would typically receive referrals for evaluation of STS to provide a specific written protocol for disposition of personnel with essentially normal hearing and/or those for whom a benign etiology (such as noise exposure or aging effects) can reliably be inferred. Effective immediately, patients with persistent STS through both follow-up tests need not be referred to audiology if the following criteria are met:

a. No otologic or audiologic complaints such as dizziness, problem tinnitus, or communication deficit.

b. Normal otoscopy (perform tympanometry if equivocal).

c. No hearing thresholds worse than 20dB at 500, 1000, 2000, or 3000 Hz; or greater than 35dB at 4000 or 6000 Hz.

d. No asymmetry of 20dB or greater between ears at any frequency.

Subj: AUDIOLOGY REFERRAL GUIDELINES FOR NORMAL HEARING PATIENTS DEMONSTRATING SIGNIFICANT THRESHOLD SHIFT

e. No previous baseline revisions in past 3 years.

3. STS patients who meet the above criteria should be counseled as to the possible cause(s) for their deteriorated hearing, refitted with personal hearing protection, have their baseline audiogram revised, and then be returned to duty. They should then be monitored per reference (a) or (b). STS notification and reporting procedures remain in effect.

4. The primary benefit of this procedural change is preservation of mission and production time, and improved availability of diagnostic audiology appointment slots for HCP-enrolled patients requiring differential diagnosis and case management. Adopting this referral policy will in no way minimize the priority for careful hearing conservation or deny the significance of threshold shifts in signaling inadequate protective practices. Rather, it underscores the important role that Hearing Conservation Technicians have in counseling their patients, and fitting them with proper personal protective equipment.

5. I may be reached to discuss the above procedures or any aspect of the Hearing Conservation Program at tel: (xxx)xxx-xxxx or e-mail: xxxxx@xxxxxxxxxxxxxxxxx.

# APPENDIX E

SAMPLE LETTER FOR NOTIFICATION OF STS
(You will need to re-type in SF 600 format)

Date:

Subj: NOTIFICATION OF SIGNIFICANT THRESHOLD SHIFT

1. This written notification of significant threshold shift is provided in accordance with OPNAVINST 5100.23 series, the Navy's primary Occupational Safety and Health instruction for forces ashore, and OPNAVINST 5100.19 (Series) for forces afloat.

2. Results of hearing tests and medical examination provided to you as part of the Hearing Conservation Program indicate you have sustained deterioration in hearing sensitivity, also known as significant threshold shift (STS). This means your hearing has worsened since your reference audiogram was established. Possible causes for this have been discussed with you and are indicated below:

____a. Noise exposure ____c. Ear disease or trauma
____b. Normal aging process ____d. Other (see remarks)

Remarks:

The following steps have been taken in response to your change in hearing:

____a. Repeat audiogram in ____ months.
____b. Re-establish reference audiogram based on current results.
____c. Evaluation/counseling by an audiologist.
____d. Referral to ear specialist (otolaryngologist).
____e. Other:

Continued deterioration of your hearing could significantly interfere with your ability to communicate. Routine use of personal hearing protectors during exposure to hazardous levels of occupational as well as non-occupational noise is therefore very important to safeguard your remaining hearing. If you have questions regarding the identification of sound levels you may be exposed to, please contact me.

Subj: NOTIFICATION OF SIGNIFICANT THRESHOLD SHIFT

Your Name Title

I have been counseled concerning possible causes for my change in hearing and my responsibilities under the Hearing Conservation Program:

Name:
Last 4 SSN:

Signature Block

FOR OFFICIAL USE ONLY
PRIVACY SENSITIVE
Any Misuse or Unauthorized Disclosure
May result in Both Civil and Criminal Penalties.

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APPENDIX F

POSITIVE AND NEGATIVE FEATURES OF SOME HEARING PROTECTIVE DEVICES

| TYPE | POSITIVE | NEGATIVE | Min – Max Noise Reduction |
|---|---|---|---|
| Plugs (pre-molded) | Inexpensive;<br>Variety of sizes;<br>Easily carried;<br>Easily cleaned. | Individual fitting by medical personnel required;<br>Frequent reinsertion may cause irritation;<br>May loosen with jaw movement. | Depending on product, compliance & fit<br><br>≈ (0 to 20 dB NRR) |
| Disposable | Inexpensive;<br>One-size-fits-most;<br>Easily carried;<br>Shows dirt so replaced more frequently | Requires conscientious insertion;<br>May loosen with jaw movement;<br>Limited choice of size;<br>Not easily cleaned. | Depending on product, compliance & fit<br><br>≈ (0 to 33 dB NRR) |
| Custom Plugs | Comfortable;<br>May be worn for long periods;<br>Sense of ownership / compliance w/ use;<br>Can accommodate Comms. & other specialized use;<br>Can be cleaned. | Expensive<br>Requires medically supervised ear impression;<br>If lost or damaged must remake;<br>With weight loss may not fit correctly;<br>May loosen with jaw movement | Depending on product, compliance fit and electronic features.<br><br>≈ (0 to 40 dB NRR) |
| Headband Ear Canal Caps | Quickly fitted without touching ears or caps;<br>Easily carried;<br>Inexpensive;<br>Easily cleaned | Relatively poor sound attenuation;<br>May be uncomfortable after short time | Depending on product, compliance & fit.<br><br>≈ (0 to 15 dB NRR) |
| Circumaural Noise Muffs | Can be worn over plugs;<br>Universal fit (one size fits most);<br>Can accommodate Comms. & other; | Relatively Expensive;<br>If swivel band must have support strap;<br>May be difficult to wear with other | Depending on product, compliance fit and electronic |

| | | | |
|---|---|---|---|
| | Can be cleaned | PPE;<br>Heavy;<br>Difficult to carry;<br>Hair and eyeglasses interfere | features.<br><br>≈ (0 to 40 dB NRR) |
| Any single type of hearing protective device will not meet the needs of all personnel in a hearing conservation program. The appropriate types of hearing protective devices should be selected while considering the factors listed above and the amount of attenuation required reducing noise to levels below an 8 hour Time Weighted Average (TWA) of 85 dB(A). | | | |

# APPENDIX G

## AUDIOMETRIC FITNESS FOR DUTY

### I. STANDARD AUDIOLOGICAL EVALUATION.

Individuals exceeding an H-2 profile must undergo a standard diagnostic audiological evaluation consisting of:

Pure tone air conduction under phones pure tone bone conduction Speech Reception Threshold's (SRT's) under phones using prerecorded standardized word list(s);

Ipsilateral and contralateral reflexes and reflex decay Word recognition abilities under phones using pre-recorded standardized speech list(s);

Phonetically Balance (PB) rollover or other VIII nerve screening is required to assist in determining the hearing loss is due to noise exposure or a medical condition. Otoacoustic Emissions (OAEs) and Auditory Brainstem Response (ABR) evaluations may also be employed at the discretion of the clinical audiologist and the availability of these services.

## AUDIOMETRIC FITNESS FOR DUTY

Individuals in the HCP exceeding H-2 criteria also require an "Audiometric Fitness for Duty" evaluation to occur during a subsequent appointment from the standard audiological evaluation, to avoid patient fatigue. The Speech Recognition in Noise Test (SPRINT) will be administered under phones, without hearing aids, and scored according to the published norms.

### II. DISPOSITION.

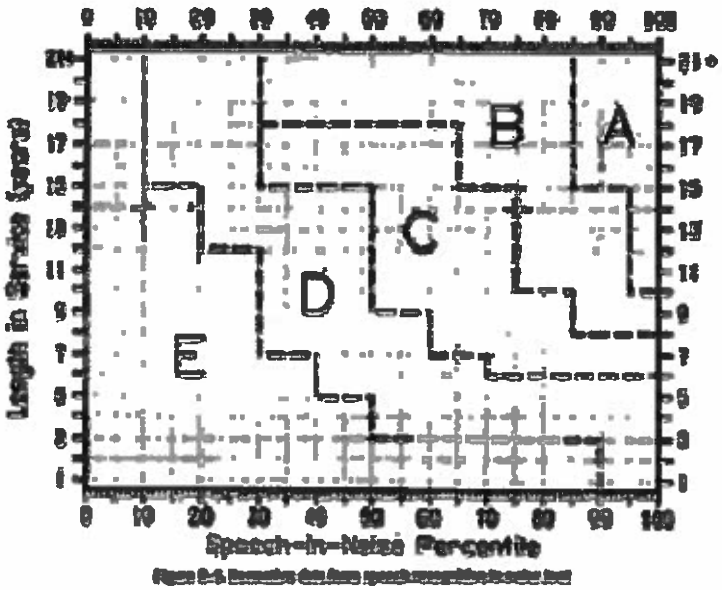
Hearing loss with a suspected medical etiology is routed through the appropriate referral process.

Recommendations for disposition will be determined using the following parameters: percentile score from the SPRINT, case history indicators, and the individual's length in service. Classifications (See Graph):

| Category | Recommendation |
|---|---|
| A: | Retention in current assignment |

| | |
|---|---|
| B: | Retention in current assignment with restrictions* |
| C: | Restrictions or removal from working in hazardous noise* |
| D: | Restrictions or removal from working in hazardous noise* |
| E: | Removal from working in hazardous noise |

**See notes.*




**Notes:*

*Restrictions are considered only for those patients with a profile exceeding H-2.*

*Category B restrictions: The level of restrictions will be at the discretion of the audiologist. Factors for consideration are the stability of the loss, potential for further noise exposure, the individual's SDOC, and the recommendations of the individual's chain of command.*

*Category C: At the discretion of the audiologist; however, minimum 50% reduction in exposure up to complete removal from hazardous noise environments.*

*Category D: At the discretion of the audiologist; however, minimum 75% reduction in exposure up to complete removal from hazardous noise environments.*

In addition to the recommended disposition from SPRINT results, personnel employed in public safety occupations and other positions where auditory localization ability is critical must have SRT's that do not exceed 30 dB for either ear. These public safety occupations include, but are not limited to Police, Security Guard and Fire Fighters.

Implementation:

These recommendations will apply to all active duty and civilian employees who enter service with the US Navy and the US Marine Corps on or after the effective date of this policy. Current active duty and civilian employees who entered service prior to these standards will be subject to the previous audiometric fitness for duty criteria. These standards do not replace any current position-specific standards that would be considered more restrictive.