

# **Navy Environmental Health Center**

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## **NAVY MEDICAL DEPARTMENT HEARING CONSERVATION PROGRAM PROCEDURES**

**NAVY ENVIRONMENTAL HEALTH CENTER**



**BUREAU OF MEDICINE AND SURGERY**

**Approved By:**

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NAVY MEDICAL DEPARTMENT  
HEARING CONSERVATION PROGRAM PROCEDURES

1. References (a) through (c) establish the basic requirements and guidance 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. It also supplements references (b) and (c).

2. Program Elements

a. The Navy Hearing Conservation Program consists of the following elements:

(1) Noise measurement and exposure analysis to identify noise hazardous areas or sources and the personnel exposed.

(2) Engineering control of noise levels to reduce the potential hazard to the maximum extent feasible.

(3) 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.

(4) Recommendations for use of hearing protective devices as an interim measure pending effective engineering controls.

(5) 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.

b. In the performance of the HCP elements, the Medical Department shares responsibilities with other major claimants and their field activities. The Medical Department is responsible for the provision of periodic hearing tests and the evaluation of this testing, and provision of refresher training in conjunction with the annual monitoring audiogram. However, the command receiving this support must provide a listing of personnel who are occupationally exposed to hazardous noise. In a similar cooperative manner, the Medical Department can "fit test" hearing protective devices, provide consultation on clinical and technical issues, and provides individual education, but the supported command is responsible for purchase and upkeep of hearing protective devices and enforcement of use. Noise measurement and analysis performed for medical purposes is under the purview of the Medical Department. Supported commands may perform similar noise measurements for engineering or other non-medical purposes. Non-Medical Department personnel who perform these measurements must also be appropriately trained and use proper instruments and procedures. Training classes other than annual refresher for HCP-enrolled personnel may be coordinated with, or provided by Medical Department personnel, but frequently they are provided by the supported command. The reduction or elimination of hazardous noise through the use of engineering controls is the preferred method of noise control, but this may not be feasible in all instances. The Medical Department is responsible for recommending potential remedial actions. If these actions are not implemented, then the other elements of the HCP must be followed.

3. 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 other personnel who have received appropriate training such as the Exposure Monitoring course or other training approved by the Navy Environmental Health Center (NAVENVIRHLTHCEN).

a. 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-nehc.med.navy.mil/ih/ihfom03.htm>

b. 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. The time weighted average (TWA) sound level must be recorded. Noise exposure data and analysis must be provided to the individual, the command, and the activity providing medical surveillance.

c. 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.

d. Identification of Personnel at Risk

(1) An 8-hour TWA exposure level 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. These measurements are made at least initially and within 30 days after notification of any significant change in operations.

(2) In the absence of dosimetric evidence and/or professional assessment to the contrary, personnel routinely exposed to sound levels greater than 84 dB(A) 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 dBA on average more than 2 days in any month. Individuals who exceed these criteria should be considered at risk. Non-enrollment of these 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.

(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 alteration or other change in facility.

e. Exceptions. Although hearing conservation measures are required when noise levels are greater than 84 dB(A), the implementation of all available measures may not be necessary in every case. For example:

(1) Visitors to a hazardous noise area should be required to wear hearing protection but not be 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 84 dB(A) for short durations so that 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.

(2) Exceptions to the basic hazardous noise criteria specified above will be evaluated on a case-by-case basis by an industrial hygienist, audiologist, or occupational medicine physician. Questions regarding the health effects of unusual noise exposures should be directed to NAVENVIRHLTHCEN. Such exceptions may include, but are not limited to, the following:

(a) Greater than 16 hours continuous or intermittent exposure per day.

(b) Intense low frequency noise, that is, when the difference between the C-weighted and A-weighted values is greater than 15 dB.

(c) High frequency noise above 10 KHz (ultrasound).

(d) High intensity noise above 140 dB sound pressure level.

(e) Impulse/impact noise above 150 dB peak sound pressure level.

#### 4. Audiometry

##### a. Technical Requirements

(1) Audiometric test chambers used for reference and monitoring audiometry will be certified annually with a Type 1 OBA meter meeting the requirements of the most recent version of ANSI S1.11. Recertification is also required when a chamber is re-located, and whenever there is a significant change in ambient noise levels that could affect hearing testing. Certification is performed by an industrial hygienist, audiologist, or others meeting guidelines established by NAVENVIRHLTHCEN. Clinical audiometric booth certification should be to the most recent version of ANSI S3.1 for the conditions in which it will be used. A sample booth certification form for medical surveillance is provided as Appendix A. Interior sound levels for these booths cannot exceed the following octave band SPLs identified by reference (a):

(a) 500 Hz. - 27 dB

(b) 1000 Hz. - 29 dB

(c) 2000Hz. - 34 dB

(d) 4000Hz. - 39 dB

(e) 8000 Hz. - 41 dB

(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 NAVENVIRHLTHCEN.

(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 helpdesk at 1-800-600-9332 or email: [help@mhs-helpdesk.com](mailto:help@mhs-helpdesk.com). Current software may also be obtained from the website: <https://imcenter.med.navy.mil/doehrs/dohrshc.html>. Software maintenance patches must also be uploaded on a monthly basis. These patches are located at the DOEHRSHC Data Repository (DR) website at: <https://doehrswww.apgea.army.mil/dohrsdr>. After logging onto the website, HC Patches are found under the DOEHRSHC menu. Follow the instructions for downloading the patch.

(4) An exception to using microprocessor-based DOEHRSHC 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 DOEHRSHC software to ensure that the DR remains current on all hearing conservation test results.

(5) Problems with DOEHRSHC 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.

(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 major repairs affecting calibration is available from NAVENVIRHLTHCEN at no cost on all audiometers used in the HCP. Clinical or diagnostic audiometers used in otolaryngology or audiology clinics are exempt from these requirements. Calibration and other requirements for clinical diagnostic audiometers are found in ANSI S3.6-1996. Maximum permissible ambient noise levels in these 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. For remote activities, or for activities where local calibration may be obtained, guidance is available from NAVENVIRHLTHCEN. Costs for local calibration and/or repair will be borne by the requesting command. Guidance to obtain authorization for local calibration is provided in reference (e). NAVENVIRHLTHCEN will also provide audiometric calibration and repair services according to the following criteria:

(a) Failure to meet biological calibration requirements.

(b) Operational failure beyond the capability of the local medical equipment maintenance and repair facility.

(7) 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.

(8) A biological calibration check is performed every day the equipment is used using an electro acoustic device or a normal hearing listener, and will be logged on DD 2217, to be electronically saved in the DOEHRS-HC system and available for review upon request. When an electro acoustic calibrator is not available, use a human listener with known baseline thresholds and normal hearing. Results of these biologic calibration checks will also be logged on a DD 2217. Additionally, a listening check will be performed every day the equipment is used and may be logged on a local form. If the daily biological test results differ from baseline audiogram by more than plus or minus 5dB at 500 - 4000 Hz, or more than plus or minus 10 dB at 6000 Hz, a second listener must be tested. Removal from service and recalibration of the audiometer is necessary if the second individual's biological test results also differ by more than plus or minus 5 dB from the baseline audiogram. A copy of DD 2217's must be maintained on one or more individuals, in addition to the results for the electro acoustic check device for situations when this device may fail.

(9) Audiometric testing will be performed by technicians certified in occupational hearing conservation. Successful completion of a Hearing Conservation Certification Course authorized/approved by the NAVENVIRHLTHCEN 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 Appendix C for a listing of Regional Audiologists who can provide assistance with certification and support with Hearing Conservation Program needs. Equivalent training sponsored by other military services may be utilized with prior permission/coordination from NEHC.

Recertification training is necessary every 3 years. 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 D.

(10) Audiometric testing will be supervised by an audiologist, otolaryngologist, occupational medicine physician, or other qualified physicians who by training or experience have the ability to manage hearing loss cases.

b. Types of Audiometric Test

(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.**

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:

(a) 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 / components (e.g., worker for Army transfers to working for Navy) the baseline remains the same.

(b) A Reference audiogram is performed after exposure to hazardous noise when the original reference audiogram was lost or was never accomplished.

(c) A Re-established Reference audiogram is performed as the result of a follow-up program.

(2) 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 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 must start 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.

(3) 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.

c. 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:

(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:

(a) If the results of the retest are not significantly different from the reference audiogram, it is assumed that the annual monitoring audiogram was in error. No additional action is necessary.

(b) 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 Reestablished Reference audiogram, category 3 on DD 2215. No consult is needed.

(2) 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).

(a) 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.

(b) 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 caused by an acute medical problem, which would invalidate subsequent hearing test results. A health record SF600 entry should be made to document the tympanometric and otoscopic findings. A copy of the tympanogram printout (if provided) should be attached 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.

NOTE: The tympanogram or the medical evaluation may be obtained immediately following the determination of STS on the annual testing test, as long as follow-up audiometry is not done on the same day as the annual audiogram.

(c) Perform a second follow-up audiogram if tympanometry/otoscopy and/or medical evaluation 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, then the consulting audiologist or appropriate physician will provide direction.

(3) Individuals who exhibit a positive STS and their supervisor will be informed of this fact, in writing, within 21 days of when an audiologist or qualified health care provider confirms the positive STS is permanent. A sample letter is provided as Appendix F.

d. 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 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 that a PTS has occurred, 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.

e. Additional Referral Criteria

(1) Individuals who exhibit the following will be seen by a medical officer who will, whenever possible, refer them to an audiologist or otolaryngologist (cross-reference SF 513 Consultation Sheet to hearing test data) when:

(a) Hearing threshold levels average greater than 25 dB at 500, 1000, 2000, and 3000 Hz or 45 dB at 4000 and 6000 Hz, in either ear, and have not been previously evaluated.

(b) Unilateral hearing loss (i.e., greater than 20 dB at 500, 1000, or 2000 Hz, or 40 dB at 3000, 4000, or 6000 Hz) that has not been previously evaluated.

(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

(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.

(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.

f. 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.

(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.

(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.

(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.

g. 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.

(1) A quality assurance sampling technique is recommended for DD 2215 and DD 2216 forms. They will be evaluated at least semi-annually (quarterly is strongly recommended) for validity, determination of significant threshold shift or hearing loss, and for possible medical referral of the patient.

(2) Technician proficiency in test instructions, administration, and fitting of hearing protective devices will be evaluated and documented at least annually. Annual in-service training is recommended.

5. 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 greater than 84 dBA or 140 dB peak 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. All sizes of pre-formed earplugs should be available at all times for personnel in the Hearing Conservation Program, and hand formed 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) may be subject to administrative or disciplinary action.

a. Fitting Procedures. Preformed sized earplugs will be fitted and issued only under Medical Department supervision. 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 (NSN 6515-01-100-1674) must be provided at no cost with each set of preformed earplugs. This case may also be used for hand formed 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.

b. Hearing Protector Selection. Information on the selection of an appropriate hearing protective device is contained in Appendix G. Although the selection of the hearing protective device is influenced by a combination of several factors, including comfort, the device's attenuation must be sufficient to reduce the employee's noise exposure to below 84 dB(A) and/or 140 dB peak. If this amount of attenuation is not achieved, other exposure control measures must be considered. These measures include engineering control, administrative exposure limitation, or the use of double protection (both plugs and

muffs). Information on noise reduction ratings (NRRs) for standard stock hearing protective devices is also given in Appendix H. Recent supply problems for some HPDs have prompted the authorization to open purchase a limited selection of government tested hearing protectors. The NAVENVIRHLTLCEN homepage at <http://www-nehc.med.navy.mil> identifies these acceptable hearing protectors and provides guidance regarding their purchase.

Within the above constraints, the user should be permitted some freedom of choice in the selection of a 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, or intense impact noise), fitness for duty evaluation or communication-critical situations.

(1) Devices used for recreational listening, such as "noise muffs" with built in radios, 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.

(2) Personnel may use custom earplugs if special circumstances require a custom hearing protective device, or if they cannot be properly fitted with approved 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 hazardous aircraft 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. Preformed or custom molded musician's earplugs will be provided to Service band members. Only audiologists, otolaryngologists, or trained medical technicians may take impressions of the ear necessary to make the custom earplugs. As always, funding for hearing protection is the responsibility of the unit, shop, command or activity supply department.

c. 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 84 dB(A). The table of noise exposure limits is contained in Appendix I.

6. 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.

a. Initial hearing conservation training must be given prior to assignment to duties in hazardous noise. Civilians enrolled in Hearing Conservation Program should obtain this training in an orientation module. For uniformed personnel this should be accomplished at basic training or during advanced 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 should be accomplished to ensure that training has been documented, and must be provided/documented as needed.

Initial training should be sufficiently comprehensive to ensure familiarity with the following training elements.

- The physical and psychological effects of noise environments and hearing loss.
- Recognition of posted and unposted noise-hazardous spaces and equipment.
- Audiometric testing and its purpose.
- The proper selection, fitting, use and care of HPDs.
- The responsibilities of both supervisors and employees in the prevention of hearing loss.
- Awareness training as to the hazards of non-occupational noise exposure during recreational activities.
- Impact of hearing loss on job performance and fitness for duty.

b. Annual refresher training is the responsibility of the command or activity. Support may be obtained from Medical Department personnel. This training may be more effective/efficient when provided in conjunction with the annual monitoring audiogram. Training when provided by Medical will be documented on the DD2216 form. In addition, when the training is provided by Medical, documentation of training must be forwarded to the command/activity.

NOTE: 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.

c. Sources for hearing conservation training materials and information include the NAVENVIRHLTHCEN Occupational Audiology Team at their home page (<http://www.nehc.med.navy.mil>), or by telephone at (757) 953-0700/DSN 377-0700. 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.

## 7. Record keeping Requirements

### a. Hearing Conservation Data

(1) All hearing conservation data will be recorded using the following forms:

- (a) DD 2215, Reference Audiogram
- (b) DD 2216, Hearing Conservation Data
- (c) DD 2217, Biological Audiometer Calibration Check
- (d) NEHC 5100/17, Industrial Hygiene Noise Survey Form
- (e) NEHC 5100/18, Industrial Hygiene Noise Dosimetry Form

(2) Disposition of completed DD 2215 and DD 2216 data forms is as follows:

- (a) A hard copy/print-out is to be placed in the individual's health record.

(b) Commands will export an electronic copy 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>.

(c) An electronic copy must be retained in a local/regional database for evaluating program compliance

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

(1) Original baseline/reference audiogram (DD 2215).

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

(3) All monitoring audiograms (DD 2216).

(4) Individual exposure documentation, typically in the location/place of work block of the DD 2215/2216. (individual exposure documentation based upon true individual measurements would not be routinely available.)

(5) Documentation of initial training and documentation of refresher training when provided in conjunction with the annual audiogram.

(6) All clinical evaluation and case management documentation provided in response to medical surveillance findings.

c. Medical Department Documentation. The following records are maintained:

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

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

(3) Results of daily Audiometer Biological Calibration Checks (DD 2217).

(4) Results of annual audiometric chamber certification.

(5) Records of proficiency evaluation and in-service training of audiometric technicians.

d. Retention of Records

(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.

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

(3) All other documentation will be retained for five years.

8. Program Performance Evaluation. Early detection of changes in hearing allows action to be taken to prevent further hearing loss. Each medical treatment facility will maintain a hearing conservation database for assessing the effectiveness of the HCP. The HCP manager will evaluate program effectiveness of all supported activities, and at least annually provide program performance evaluations to supported activities based on the following measures. This information must also be maintained for inspections, audits, or epidemiological trending.

a. 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.

$$\frac{\text{\#in HCP with current audiogram}}{\text{\# in HCP}} \times 100 = \% \text{ compliance}$$

b. 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.

$$\frac{\text{\# of STS detected}}{\text{\# monitored}} \times 100 = \% \text{ incidence STS}$$

c. 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.

$$\frac{\text{\# PTS detected}}{\text{\# monitored}} \times 100 = \text{incidence PTS}$$

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 NEHC.

## References

- (a) DOD INST 6055.12 “DOD Hearing Conservation Program”, March 5, 2004.
- (b) OPNAV INST 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-5 132 “Revised Bureau of Medicine and Surgery (BIJMED) Equipment Management Manual”, February 27, 1997.

**AUDIOMETRIC TEST BOOTH CERTIFICATION**

Command Owning Booth: \_\_\_\_\_

Date Measurements Were Made: \_\_\_\_\_

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**Audiometric Test Booth Data**

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Booth Location: \_\_\_\_\_

Significant Operating Conditions: \_\_\_\_\_

---

OBA/SLM Data	Microphone Data	Octave Band Filter Calibration Data (If separate)
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Manufacturer:	Manufacturer:	Manufacturer:
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Model#:	Model#:	Model
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Serial#:	Serial#:	Serial#:
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Elec/Acoust Cal:	Elec/Acoust Cal:	Elec/Acoust Cal:
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Field Pre-Cal OK?  Yes  No    Field Post-Cal OK?  Yes  No

**Field Measurements**

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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		

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\* 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: \_\_\_\_\_

## FIELD GUIDE TO AUDIOMETRIC TEST BOOTH CERTIFICATION

- Ref: (a) OPNAVINST 5100.23F (NAVOSH ASHORE), Chapter 18  
(b) OPNAVINST 5100.19D (NAVOSH AFLOAT), Chapter B4  
(c) NEHC Technical Manual TM 6260.51.99-1 (May 1999), "Navy Medical Department Hearing Conservation Procedures"  
(d) ANSI S3.1-1991 (R1999), "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-nehc.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 dBA and dBC levels.

- 7) At some point during the process, advise you 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 re-certification, 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 environment. Assuming good hearing sensitivity by the listener, ambient noise should permit thresholds 0-5dB at 500 Hz, and 0dB at 1000 Hz and above. This could be called the “Golden Ear” method

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. Enclosure (2) is a clinical booth certification form for personnel desiring to conduct sound field warble tone testing (ears uncovered). Enclosure (3) is a certification form for those conducting ears covered testing only, to include testing under headphones and using insert earphones. Download it [here](#). The ears covered MPANLs are considerably more lenient at low frequencies. The complete ANSI S3.1-1999 can be ordered on-line at <http://www.ansi.org/>

### **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. Some booths simply pass headphone and hand switch wiring through a hole in the jack panel. Sound attenuating material should be carefully packed around the wiring to seal the opening. 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 2 or 3 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 effected, 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 Environmental Health Center Hearing Conservation/Audiology Team at DSN 377-0772/0773, commercial (757) 953-0772/0773, e-mail [hearing@nehc.mar.med.navy.mil](mailto:hearing@nehc.mar.med.navy.mil)

## **Audiology Regions**

<b><i>Audiology Region 1A NACC Portsmouth NH Activity</i></b>	<b><i>(207) 438-2081 DSN 684-</i></b>
Portsmouth NH NMC - Medical Clinic	
Portsmouth NH NMC -Brunswick	
<b><i>Audiology Region 1B NACC Newport RI Activity</i></b>	<b><i>(401) 841-2281 DSN 948-</i></b>
Newport RI NH-Hospital	
Newport RI NH-NUWC	
<b><i>Audiology Region 1C NACC Groton CT Activity</i></b>	<b><i>(860) 694-3870/2499 DSN 694-</i></b>
Groton CT NH- Hospital	
Groton CT NH-Ballston Spa	
<b><i>Audiology Region 1D NMMC Bethesda MD (Southern Sites) Activity</i></b>	<b><i>(410) 293-2009</i></b>
Annapolis MD NMC-Occ Health	
Annapolis MD NMC-Precomm Site	
Bethesda MD NNMCCEN- MedCen	
Bethesda MD NNMCCEN-Carderock	
Bethesda MD NNMCCEN-Dahlgren	
Bethesda MD NNMCCEN-Indian Head	
Bethesda MD NNMCCEN-NAF	
Bethesda MD NNMCCEN-NRL	
Bethesda MD NNMCCEN-Shipyard (WNY)	
Bethesda MD NNMCCEN-Sugar Grove	
Patuxent River MD NH - Occupational Health	
Quantico VA NMC-Clinic	
<b><i>Audiology Region 1E NMMC Bethesda MD (Northern Sites) Activity</i></b>	<b><i>732-866-2300/2302</i></b>
Bethesda MD NNMCCEN-ColtsNeck (Mainside)	
Bethesda MD NNMCCEN-Lakehurst	
Bethesda MD NNMCCEN-Mechanicsburg	
Bethesda MD NNMCCEN-Philadelphia	
Bethesda MD NNMCCEN-WillowGrove	

***Audiology Region 2A NMC Portsmouth VA  
Activity***

***(757) 444-7599 DSN 441-***

Portsmouth VA NMCEN - Dam Neck  
Portsmouth VA NMCEN -Little Creek  
Portsmouth VA NMCEN -MOHCATs  
Portsmouth VA NMCEN -MOHCATs  
Portsmouth VA NMCEN -Northwest  
Portsmouth VA NMCEN -Oceana  
Portsmouth VA NMCEN -Shipyard  
Portsmouth VA NMCEN -Yorktown  
Guantanamo Bay Cuba -Hospital  
Keflavik Iceland NH-Hospital  
Portsmouth VA NMCEN -Lafayette River  
Portsmouth VA NMCEN -SewellsPt Occ Hlth  
USS BATAAN, LHD-05  
USS DWIGHT D. EISENHOWER, CVN-69  
USS ENTERPRISE, CVN-65  
USS GEORGE WASHINGTON, CVN-71  
USS HARRY S. TRUMAN, CVN-75  
USS KEARSARGE, LHD-03  
USS MOUNT WHITNEY, LCC-20  
USS NASSAU, LHA-04  
USS RONALD REAGAN, CVN-76  
USS SAN ANTONIO, LPD 17  
USS SIAPAN, LHA-02  
USS THEODORE ROOSEVELT, CVN-71  
USS WASP, LHD-01

***Audiology Region 2B NH Camp Lejeune NC***

***910-451-2767 ext  
285 or DSN 751-2767***

***Activity***

Camp Lejeune NC NH-Bldg. 65  
Camp Lejeune NC NH-Bldg. HP15 (Hadnot Point)  
Camp Lejeune NC NH-Camp Geiger  
Camp Lejeune NC NH-Caron  
Camp Lejeune NC NH-French Creek  
Camp Lejeune NC NH-Hospital  
Camp Lejeune NC NH-MCAS New River  
Camp Lejeune NC NH-MOHCAT 1  
Camp Lejeune NC NH-MOHCAT 2  
Cherry Point NC NH-Hospital  
Cherry Point NC NH-OccHealth

***Audiology Region 2D NEHC***

***(757) 953-0773 DSN 377-***

***Activity***

Hearing Conservation Head Norfolk VA NEHC

***Audiology Region 3A NH Beaufort SC Activity*** (843) 525-2528 DSN 832-  
 Beaufort SC NH - MCRD  
 Beaufort SC NH - MCAS

***Audiology Region 3B NH Jacksonville FL Activity*** (904) 542-3500 x8723 DSN 942-  
 Jacksonville FL NH- Branch Clinic NAS  
 Jacksonville FL NH-Albany Occ Med  
 Jacksonville FL NH-Atlanta  
 Jacksonville FL NH-KeyWest  
 Jacksonville FL NH-Kings Bay  
 Jacksonville FL NH-Mayport  
 Jacksonville FL NH-MOHCAT A  
 Jacksonville FL NH-MOHCAT B  
 Jacksonville FL NH-Nadep  
 USS JOHN F. KENNEDY, CVN-67

***Audiology Region 3C NH Charleston SC Activity*** (843) 743-7850 DSN 563-  
 Charleston SC NH- Hospital  
 Charleston SC NH-BMC Weapons Station

***Audiology Region 4A NH Pensacola FL Activity*** (850) 452-5242 ext 130 DSN 922-  
 Pensacola FL NH- BMC NAS  
 Pensacola FL NH-BMC Gulfport  
 Pensacola FL NH-BMC Millington TN  
 Pensacola FL NH-BMC NAS New Orleans  
 Pensacola FL NH-Corry  
 Pensacola FL NH-Meridian  
 Pensacola FL NH-NACC New Orleans  
 Pensacola FL NH-NATTC  
 Pensacola FL NH-NoMI  
 Pensacola FL NH-Panama City  
 Pensacola FL NH-Pascagoula  
 Pensacola FL NH-Whiting Field  
 Corpus Christi TX NH-Hospital  
 Corpus Christi TX NH-Ingleside  
 Corpus Christi TX NH-Kingsville  
 Corpus Christi TX NH-NASJRB Dallas  
 Special Boat Unit Twenty-Two

***Audiology Region 5 NH Great Lakes Activity*** (847) 688-5568 Ext 32 DSN 792-  
 Great Lakes IL NH- Recruit  
 Great Lakes IL NH-NTC Bldg 237  
 Great Lakes IL NH-NWS Crane

***Audiology Region 9A NMC San Diego CA  
Activity***

***(559) 998-1200 DSN 949-1200***

Lemoore CA NH-BMC OccHealth  
Lemoore CA NH-Fallon  
San Diego CA NMCEN - El Centro  
San Diego CA NMCEN - MCRD  
San Diego CA NMCEN - Miramar  
San Diego CA NMCEN - MOHCAT A  
San Diego CA NMCEN - NAB  
San Diego CA NMCEN - NAS NoRIS (USN)  
San Diego CA NMCEN - Naval Station  
San Diego CA NMCEN - NTC  
San Diego CA NMCEN - San Clemente  
USS BELLEAU WOOD, LHA-03  
USS BONHOMME RICHARD LHD-6  
USS BOXER, LHD-04  
USS CONSTELLATION, CVN-64  
USS JOHN C. STENNIS CVN-74  
USS NIMITZ, CVN-68  
USS PELELIU, LHA-05  
USS TARAWA, LHA-01

***Audiology Region 9B NH Camp Pendleton CA  
Activity***

***(760) 725-1551/1644 DSN 365-***

Camp Pendleton CA NH - ACU5  
Camp Pendleton CA NH - BMC 22 Area  
Camp Pendleton CA NH - BMC 33 Area  
Camp Pendleton CA NH - BMC 41 Area  
Camp Pendleton CA NH - BMC 43 Area  
Camp Pendleton CA NH - BMC 52 Area  
Camp Pendleton CA NH - BMC 53 Area  
Camp Pendleton CA NH - BMC 62 Area  
Camp Pendleton CA NH - BMC Area 13  
Camp Pendleton CA NH - BMC Area 14  
Camp Pendleton CA NH - BMC CORCEN  
Camp Pendleton CA NH - BMC Delmar 21 Area  
Camp Pendleton CA NH - BMC Edson Range  
Camp Pendleton CA NH - BMC MCT Aid Station  
Camp Pendleton CA NH - Hosp  
Camp Pendleton CA NH - MCAS Yuma  
Camp Pendleton CA NH - MCLB Barstow  
Camp Pendleton CA NH - MCMWTC Bridgeport  
Camp Pendleton CA NH - Point Mugu  
Camp Pendleton CA NH - Port Hueneme  
Camp Pendleton CA NH - Seal Beach

***Audiology Region 9C NH Twentynine Palms CA (760) 830-2420 DSN 957-Activity***

Twenty Nine Palms NH - Branch Clinic -  
Twenty Nine Palms NH - China Lake  
Twenty Nine Palms NH - Hospital

***Audiology Region 11 NH Bremerton WA (360) 476-8698 DSN 439-Activity***

Bremerton WA NH- PSNS  
Bremerton WA NH-Bangor  
Bremerton WA NH-Everett  
Bremerton WA NH-Indian Island  
Bremerton WA NH-Keyport  
Bremerton WA NH-MOHCAT  
Oak Harbor WA NH-Hospital - Hospital  
Oak Harbor WA NH-Hospital - OH  
USS ABRAHAM LINCOLN, CVN-72  
USS CARL VINSON, CVN-70

***Audiology Region 98A NMCL Pearl Harbor HI (808) 474-0628 DSN 315-424-Activity***

Pearl Harbor HI NMC- Shipyard  
Pearl Harbor HI NMC-Barking Sands  
Pearl Harbor HI NMC-Camp H.M. Smith  
Pearl Harbor HI NMC-Kaneohe Bay  
Pearl Harbor HI NMC-MOHCAT  
Pearl Harbor HI NMC-Wahiawa

***Audiology Region 99A USNH Rota SP 011-34-956-82-3342 DSN 314-727Activity***

Rota Spain NH- Hospital  
Rota Spain NH-Occ Health  
London NMC-St Mawgan UK  
London UK NMC-NavMedClinic

***Audiology Region 99B USNH Naples IT 011-39-081-724-4499/4500 DSN 314-629-6287-Activity***

Naples Italy- NH  
Naples Italy-BMC Capodochino  
Naples Italy-BMC Gaeta  
Naples Italy-BMC LaMaddallena  
USS EMORY S. LAND, AS-39

***Audiology Region 99C USNH Sigonella IT 011-39-095-56-4536 DSN 314-624-Activity***

Sigonella Italy NH-BMC Souda Bay  
Sigonella Italy NH- Hospital  
Sigonella Italy NH-Flight Line Clinic  
ASU Bahrain

***Audiology Region 98B USNH Yokosuka JA  
243-***

***011-81-6160-43-2612 DSN 315-***

***Activity***

Yokosuka Japan NH- Hospital  
Yokosuka Japan NH-Atsugi  
Yokosuka Japan NH-Chinhae Korea  
Yokosuka Japan NH-Fuji  
Yokosuka Japan NH-Sasebo  
Diego Garcia - Clinic  
USS BLUE RIDGE, LCC-19  
USS ESSEX, LHD-02  
USS KITTY HAWK, CVN-63

***Audiology Region 98C USNH Okinawa JA  
643-***

***011-81-611-743-7803 DSN 315-***

***Activity***

Okinawa Japan NH- (Camp Lester)  
Okinawa Japan NH- Camp Schwab  
Okinawa Japan NH-Camp Foster (Evans)  
Okinawa Japan NH-Camp Futenma  
Okinawa Japan NH-Camp Hansen  
Okinawa Japan NH-Camp Kinser  
Okinawa Japan NH-Camp Shields  
Okinawa Japan NH-Courtney (Bush)  
Okinawa Japan NH-White Beach

***Audiology Region 98D USNH Guam MI***

***Activity***

Guam NH - Hospital  
USS FRANK CABLE, AS-40

***Audiology Region 98E BMC Iwakuni JA  
243-***

***011-81-6160-43-3104 DSN 315-***

***Activity***

Yokosuka Japan NH-Iwakuni

# 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 3 years after an abbreviated block of 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 NAVENVIRHLTHCEN, 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. (Use it or lose it applies!)
- 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.

## II DOCUMENTATION OF PROFICIENCY

Wherever 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 and tympanometry
- 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 % of records/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**

(checkmark = 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:

**2. Record keeping/forms:** (Average monthly workload \_\_\_\_\_)

\_\_\_ SOP \_\_\_ current instrux available \_\_\_ DD2217s \_\_\_ listening checks  
\_\_\_ workload documentation \_\_\_ command rosters  
\_\_\_ DD2216s (\_\_\_ reviewed, \_\_\_ errors noted) # health records pulled \_\_\_\_\_  
\_\_\_ DD2215s (\_\_\_ reviewed, \_\_\_ errors noted)

Comments:

**3. 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: \_\_\_\_\_

date

Memorandum

From: Operational Audiology Officer, NH xxxxxxxx  
To: Hearing Conservation Technicians and other Medical Surveillance Personnel Supported  
by Naval  
Hospital xxxxxxxxxxxx

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

Ref: (a) OPNAVINST 5100.19D, NAVOSH AFLOAT, CH B4  
(b) OPNAVINST 5100.23F, 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.
- 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 can be reached to discuss the above procedures or any aspect of the Hearing Conservation Program at tel xxxxxxxxxxxxxxxx or email xxxxxxxxxxxxxxxxxxxxxxxx.

**SAMPLE LETTER FOR NOTIFICATION OF STS**

(You will need to re-type in SF 600 format)

Date:

Subj: NOTIFICATION OF SIGNIFICANT THRESHOLD SHIFT

1. Results of hearing tests and medical examination provided to you as part of the Hearing Conservation Program indicate that you have sustained deterioration in hearing sensitivity, also known as significant threshold shift (STS). This means that your hearing has gotten worse 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:

2. 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:

3. 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.

4. 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 5100.19C for forces afloat.

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:

**POSITIVE AND NEGATIVE FEATURES OF SOME  
HEARING PROTECTIVE DEVICES**

<u>TYPE</u>	<u>POSITIVE</u>	<u>NEGATIVE</u>	<u>DURATION</u>
<u>Plugs</u>	After adaption to wearing, can be used for long periods. Inexpensive.	Individual fitting by medical personnel required. Frequent reinsertion may cause irritation. May loosen with jaw movement.	Long-term (3-4 hours);
<u>Headband Ear Caps</u>	Quickly fitted without touching ears. Easily carried.	Uncomfortable after 1 hour.	Short-term.
<u>Disposable</u>	Comfortable. Individual fitting is required. Relatively inexpensive.	Molded by hand. Easily soiled. Difficult to clean.	Infrequent use. Transitory noise exposure.
<u>Circumaural Muff</u>	May be worn over plugs to provide double protection. Most efficient universal device.	Expensive. Heavy. Difficult to carry. Hair or eyeglasses often reduce effectiveness.	Long or Short-term.

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 TWA of 84 dBA

**NOISE REDUCTION RATINGS (NRR)  
FOR APPROVED HEARING PROTECTIVE DEVICES  
(TO BE SUBTRACTED FROM C-WEIGHTED NOISE LEVELS)**

<u>Manufacturer's Nomenclature/NSN</u>	<u>NRR</u>
1. Ear Defender, V-51R 6515-00-442-4765 - x-small 6515-00-467-0085 - small 6515-00-467-0089 - medium 6515-00-442-4807 - large 6515-00-442-4813 - x-large	23 <sup>1</sup>
2. Comfit, Triple Flange 6515-00-442-4821 - small 6515-00-442-4818 - regular 6515-00-467-0092 - large	26
3. Silaflex 6515-00-133-5416	21
4. EAR or Decidamp 6515-00-137-6345	29
5. Sound-Ban 6515-00-392-0726	18
6. Circumaural Muff (Type II) 4240-00-022-2946	23 <sup>2</sup> 20 <sup>3</sup>
7. High Performance Circumaural Muff	23 <sup>4</sup>

Notes:

1. Values represent the level of hearing protection expected for 97.5% of wearers, mean minus two standard deviations.
2. Headband worn over top of head.
3. Headband worn behind the head.
4. Provides extra low frequency noise protection.

(Note: Field evaluation of hearing protectors suggest NRR's may over-estimate actual attenuation. This should be considered when determining adequacy of HPDs.)

**ADMINISTRATIVE CONTROL OF NOISE EXPOSURE  
WITH HEARING PROTECTIVE DEVICES (STAY TIME)**

<u>Ambient Noise Level</u>  (dBA)	<u>Limiting Time (Hr:Min) Per 24 Hour Day</u> <u>Hearing Protector Noise Reduction Rating (NRR)</u>			
	<u>10</u>	<u>20</u>	<u>30</u>	<u>40</u>
90	16:00	-----	-----	-----
94	08:00	-----	-----	-----
98	04:00	-----	-----	-----
102	02:00	11:18	-----	-----
106	01:00	05:39	-----	-----
110	00:30	02:49	16:00	-----
114	00:15	01:25	08:00	-----
118	-----	00:42	04:00	-----
122	-----	00:21	02:00	11:18
126	-----	-----	01:00	05:39
130	-----	-----	00:30	02:49
134	-----	-----	00:15	01:25
138	-----	-----	-----	00:42

Note - Values other than those given above may be calculated using the following formula:

$$T = 16 \div 2^{[(L - 80)/4]}$$

Where T = Time in hours (decimal)

L = Effective Sound Level, dB(A)

Adding or subtracting the decibel difference to the appropriate column may interpolate intermediate values.

## USING DOEHRS-HC

1. Open DOEHRS-HC and log in.
2. Open CCA-200 and log in.

### Functional Listening Check

1. Click on **Audiometer**.
2. Click on **Functional Check**.
3. Click on **Booth 1** (if not already selected).
4. Go into the booth and put the headphones on. Press the hand switch. Listen for different frequencies in left ear, and decreased volume levels in right ear. Press the hand switch once to reverse what is heard in the right and left ears.
5. Then test other stations in booth, if applicable.
6. Return to the PC.
7. Click on **close**.

### Daily Calibration Check

1. Go into the test booth and plug the electroacoustic simulator into the hand switch jack. Put the headphones on the simulator (red-right, blue-left).
2. Click on **Daily Calibration**.
3. Click on **set**.
4. Select stations/booths you are going to check (not necessary if there is only one station).
5. Start the test.
6. When the test is complete, bring up DOEHRS-HC and click **R** or **Retrieve from Audiometer**.
7. Choose a listener. Select the listener or simulator with the appropriate serial number or terminology that matches the one you used in the test booth for each station (or enter a new listener).
8. Ensure that the Bio Cal checks passed.

### Testing Patients

1. Clear the Calibration test from the screen.
2. Place patient(s) in booth with headphones on.
3. In the CCA-200 screen, start the test. Then minimize this screen.
4. In the Run Test screen of DOEHRS-HC, enter the patient's ID Number (SSN). Then enter all pertinent demographic patient information.
5. Enter the DD2215 thresholds if not already stored in DOEHRS-HC. Ensure that you are using the most recent DD2215 in the patient's medical record.
6. Click on the **T** to transfer all data to the **CCA-200**.
7. Restore the **CCA-200** screen to observe the test.
8. When testing is complete, click on **R** or **Retrieve from Audiometer**.
9. Click on **P** to print the new DD2216.

**To retrieve patient demographics from the DOEHRS-HC Data Repository (DR):**

1. In Run Test Window, enter patient's SSN and hit Enter. If Demographics don't populate:
2. Highlight the SSN, Hit Ctrl-C
3. Hit the **Clear** Button
4. Go to **Data -> DR Inquire**
5. Put cursor in IDN window and hit Ctrl-V
6. Hit **Submit**
7. If records are imported, return to the Run Test Window.
8. Put the cursor in the SSN field, hit Ctrl-V, then Return
9. Demographics should populate.
10. Review demographics and make ALL necessary updates/changes