Ames Procedural Requirements

APR 8715.1

Effective Date: February 28, 2023

Expiration Date: November 15, 2026

COMPLIANCE IS MANDATORY

Subject: Chapter 29 – Hearing Conservation Program

Responsible Office: Code QH / Occupational Safety, Health, and Medical Service Division

CHANGE LOG

Status [Baseline /Revision /Cancelled]	Document Revision	Date of Change	Description
Revision	2	5/2/2018	In section 29.4.3 (Personal Hearing Protection), changed the noise level at which hearing protection needs to be available for personnel entering an area from 80 dBA to 82 dBA. The change will make Ames requirement consistent with NPR 1800.1D. In section 29.4.4.d, Changed the noise dosimetry repeat frequency from every three years to “as needed" (such as work process changed, new equipment used) for employees in the hearing conservation program. The criteria for repeat of monitoring are already stated in 29.4.4.b.
Revision	3	2/5/2020	Administrative correction of the title of Chapter 29 on page 4 to “Hearing Conservation Program”
Revision	4	2/28/2023	Updated criteria for double hearing protection in paragraph 29.3.3.3 and administrative edits.

TABLE OF CONTENTS

PREFACE

P.1 PURPOSE

a. This chapter establishes minimum requirements to protect employees from hearing loss due to noise exposure at work. Hearing protection, noise monitoring, hazardous noise warning signs, and medical monitoring are covered in this chapter.

b. The government is responsible to implement this program only for NASA civil servant employees and the government will share information about the program requirements with contractors that will assist them in the implementation of their hearing conservation programs. From here on, the words supervisor(s) and employee(s) refer only to NASA civil service employees.

P.2 APPLICABILITY

a. This directive is applicable to ARC and associated facilities.

b. This directive applies to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, grants, or agreements.

c. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term "shall." The terms "may" or "can" denote discretionary privilege or permission, "should" denotes a good practice and is recommended, but not required, "will" denotes an expected outcome, and "are/is" denotes descriptive material.

d. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

a. OSHA Occupational Noise Exposure, 29 CFR §1910.95

b. OSHA Recording Criteria for Cases Involving Occupational Hearing Loss, 29 CFR §1904.10

c. NPR 1800.1, NASA Occupational Health Program Procedures

P.4 APPLICABLE DOCUMENTS AND FORMS

a. ANSI S3.1, Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms[1]

b. ANSI S3.6. Specification for Audiometers[2]

c. OSHA Technical Manual[3]

d. Buy Quiet Roadmap Procedures (NASA Buy Quiet Program)[4]

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[1] ANSI S3.1: https://webstore.ansi.org/standards/asa/ansiasas31999r2018
[2] ANSI S3.6: https://webstore.ansi.org/standards/asa/ansiasas32018
[3] OSHA Technical Manual: https://www.osha.gov/otm
[4] Buy Quiet: http://buyquietroadmap.com/buy-quiet-purchasing/buy-quiet-process-roadmap

P.5 MEASUREMENT/VERIFICATION

a. Verification of conformance to requirements in this directive are measured through Center and Responsible Organizational management reviews, self-assessments, and subsequent analysis and reports of conformance to requirements, as well as periodic internal audits and Ames Voluntary Protection Program (VPP) self-inspections.

P.6 CANCELLATION

a. APR 8715.1 Chapter 29, Hearing Conservation Program, dated May 2, 2018.

EUGENE TU

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Date: 2023.02.27 17:12:09 -08'00'

Eugene Tu
Director

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CHAPTER 29 HEARING CONSERVATION PROGRAM

29.1 Responsibilities

29.1.1 **The Occupational Safety, Health, and Medical Service Division** shall:

a. Provide hearing loss prevention related guidance (such as hearing protection and noise mitigation) to supervisors and employees exposed to hazardous noise.

b. Provide periodic noise monitoring.

c. Review the Hearing Conservation Program (HCP) and training for adequacy annually.

d. Notify employees and their supervisors of their noise survey/dosimetry results.

e. Notify supervisors when affected employees must participate in a Hearing Conservation Program.

f. Identify when hearing protection is required and what hearing protection devices are appropriate.

g. Notify supervisors and managers when areas have been designated as noise hazards.

h. Provide and maintain hearing conservation training (SATERN Course ARC-002-08).

i. Identify procurement specifications for potentially noisy equipment, as required to meet the noise emission and control requirements of the "Buy Quiet and Quiet by Design" program.

j. Conduct a mishap investigation, to include an evaluation of the adequacy of engineering controls, administrative controls, work practices, and hearing protection device (HPD), when notified that an employee has experienced a Standard Threshold Shift (STS) as a result of potential occupational noise exposure.

k. Maintain a current registry of all ARC civil servants and Disaster Assistance and Rescue Team (DART) members included in the HCP.

l. Record the STS on the OSHA 300 Log when it is determined that an employee has experienced an OSHA-recordable STS (see section 29.8.5) as a result of occupational noise exposure.

29.1.2 **The Ames Health Unit** shall:

a. Maintain a current registry of all ARC civil servants and Disaster Assistance Rescue Team (DART) members included in the Hearing Conservation Program (HCP.)

b. Provide audiometric examinations for NASA employees and DART members and provide written notification of the need to avoid exposure to noise levels of 82 dB-A weight (dBA) or greater for 14 hours preceding testing at baseline and testing to confirm an STS.

c. Obtain an occupational history and medical evaluation of each participant in the HCP.

d. Provide written notification to the employee, their supervisor, and the Occupational Safety, Health and Medical Services Division within 21 days of receiving audiometric test results indicating an STS or other significant occupational hearing loss and explain the need and plans for further testing and/or referral.

e. When employee appears to have an STS, provide a re-test confirmation audiogram within 30 days to determine whether the identified hearing loss is permanent (i.e., a PTS).

f. Provide for medical examination by a physician, audiologist, or qualified occupational health personnel, of any employee with STS and/or PTS to verify proper fit of hearing protection.

g. Recommend reassignment of any at-risk employee to work in low-noise areas, if necessary to prevent further hearing loss or aggravation of other medical conditions.

h. Refer employees to an Audiologist or Physician Specialist, as appropriate.

i. Medical personnel performing audiometry must be qualified, trained, and knowledgeable in operating any equipment used, and must function under the supervision of a Physician or Audiologist.

j. Maintain audiometric test records and other information pertinent to the medical monitoring requirements.

k. Conduct exit audiograms for HCP participants when they terminate employment or when they are transferred to a reduced noise work area and/or when new work duties no longer include hazardous exposures or activities.

l. Ensure audiometric test equipment is properly calibrated and ambient noise levels in audiometric test rooms and booths meet the requirements specified in the latest revision of ANSI S3.6, Specification for Audiometers, and ANSI S3.1, Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms.

m. Maintain all calibration records training records and certifications for medical equipment and personnel.

29.1.3 **Supervisors and Managers** of each Organization shall:

a. Report suspected hazardous noise any new potential hazardous noise source and change in configuration or condition to a designated hazardous noise area to the Ames Occupational Safety, Health and Medical Services Division.

b. Ensure that any employee who works in a designated hazardous noise area receives pre-placement, annual, and termination audiograms.

c. Refer personnel who complain of hearing loss or ear problems to the Ames Health Unit.

d. Ensure that employees use HPD when in a hazardous noise area.

e. Notify the Occupational Safety, Health and Medical Services Division of plans to acquire any equipment that produces greater than 80 dBA at a distance greater than 1 meter.

f. Ensure that HPD are available to employees and visitors in areas with noise level at or greater than 82 dBA.

g. Ensure that employees enrolled in the HCP complete required training annually.

h. Ensure employees enrolled in the HCP complete required audiometric testing at least annually.

i. Ensure that caution signs are posted at entrances to designated hazardous noise areas and that appropriate labels, decals, or placards are placed on noisy tools and equipment, unless used only in posted hazardous noise areas.

j. Ensure engineering controls that are recommended by Ames Occupational Safety, Health and Medical Services Division to reduce noise exposures to acceptable limits or to the maximum extent feasible are implemented.

k. Consider noise emission levels when purchasing equipment.

l. Properly maintain noise-producing equipment and controls to preclude noise increases.

m. Update training and physical exam requirements for employees by reviewing and updating questionnaires in the Ames Safety and Accountability Program training and physical exam surveys at least annually or when new work duties include hazardous exposures or activities.

n. Ensure employees who experience a repeated STS, after having a new baseline established, shall complete a fitness and risk assessment before returning to work in a hazardous noise area.

29.1.4 **Contracting Officers** shall:

a. As notified by the government representative who is requesting the good or services in coordination with the Ames Occupational Safety, Health, and Medical Services Division, include requirements for a written Hearing Conservation Program that meets requirements in APR 8715.1 Chapter 29 in all contracts unless the contractor can demonstrate there is no noise hazard for their employees.

b. As notified by the government representative who is requesting the good or services in coordination with the Ames Occupational Safety, Health, and Medical Services Division, ensure that "Buy Quiet and Quiet by Design" provisions are included in contracts and in the purchase of new equipment.

29.1.5 **Employees** who work in hazardous noise areas shall:

a. Wear and maintain HPD as required.

b. Cooperate with supervisors, the Ames Health Unit, and Ames Occupational Safety, Health and Medical Services personnel in activities undertaken to evaluate hazardous noise.

c. Notify supervisors of changes in operations, or equipment that may produce hazardous noise.

d. If enrolled in the HCP, complete annual hearing conservation training.

e. If enrolled in the HCP, complete an annual audiogram.

f. Ensure a final audiogram is taken upon leaving employment or transferring to a non-hazardous noise area and/or when new work duties no longer include hazardous exposures or activities.

29.1.6 **The Acquisition Division** shall:

a. Ensure contract, service or equipment procured compliant to the requirements stated in this chapter.

b. Ensure that the Buy Quiet roadmap procedures stated in the NASA Buy Quiet Program website are followed for any procurement of equipment that generates noise levels greater than 80 dBA.

29.1.7 **The Facilities Engineering and Real Property Management Division** shall:

a. Include noise emission and control requirements in procurement specifications and designs for any facility or equipment that may be expected to produce large amounts of noise, except for specialized research items on flight hardware.

b. Ensure that the Buy Quiet roadmap procedures stated in the NASA Buy Quiet Program website are followed for any procurement of equipment that generates noise levels greater than 80 dBA.

c. Consider acoustics in the design and modification of buildings and facilities

29.1.8 **Contractors** shall:

a. As required in their contract, implement an HCP that meets the requirements of this chapter if any of their employees have job responsibilities that may require exposure to hazardous levels of noise.

b. Ensure that contractor employees who work in high noise areas comply with the contractor's HCP.

29.2 Noise Exposure Limits

29.2.1 Protection against the effects of noise exposure shall be provided when sound levels exceed those in the tables below. Noise exposures are generally determined based on an eight-hour time-weighted average (TWA) for continuous noise, and pulse per minute for impulse noise. For exposures shorter or longer durations, the exposure limit may be adjusted as indicated in the table.

29.2.2 HCP elements are required to be implemented at the Action Level; that is whenever employee noise exposures equal or exceed an eight-hour time-weighted average of 82 dBA for 30 days or more per year, or 85 dBA for one day or more per year. Hearing Conservation Program elements include exposure monitoring, audiometric testing, medical monitoring, and training. Participation in the medical monitoring program for hearing conservation is specified in Section 29.4 of this Chapter. NASA's allowable noise exposure limit is the equivalent to an 85 dBA, eight-hour Time-Weight Average (TWA) exposure using a 3 dB exchange rate as shown in The Continuous Noise Permissible Exposure Limit table in NPR 1800.1, Chapter 4.

29.2.3 The Continuous Noise Permissible Exposure Limits table found in NPR 1800.1 contains noise exposure levels and durations that are equivalent to this limit as calculated by the following formula where L stands for exposure level and T for duration:

$$T\ (\text{min}) = 480/2^{(L-85)/3}$$

29.2.4 Exposures exceeding the equivalent exposures in the Continuous Noise Permissible Exposure Limits table shall be controlled, reduced, or eliminated through a hierarchical combination of engineering controls, administrative controls, and hearing protection devices.

29.2.5 Noise dose shall include all impact/impulse noise measured up to and including 140 dB peak sound pressure level.

29.2.6 The action level is 82 dBA, eight-hour TWA.

29.3 Hearing Protection Methods

29.3.1 Engineering Controls

Where feasible, facilities and equipment will be procured, designed, operated, and/or modified in such a manner as to reduce the noise level (measured at employee's operating position) to below 85 dBA or 140 dB peak sound pressure (for impulsive noise). Any reduction in employee noise exposure, even if not reduced below 85 dBA, is beneficial. If engineering controls fail to reduce sound levels to within the limits of section 29.2.3, administrative controls and/or personal hearing protection equipment must be used.

29.3.2 Administrative Controls

If engineering controls and personal hearing protection equipment are not sufficient to attenuate noise to less than 85 dBA, the duration of time spent in the noise hazard area shall be limited, so as not to exceed the exposure limits specified in this Chapter (Section 29.2.3), whenever feasible.

29.3.3 Personal Hearing Protection

29.3.3.1 Temporary Use. Personal HPD is to be used only temporarily or when engineering controls are not feasible or practical.

29.3.3.2 Availability. All personnel who enter designated areas, or who perform tasks where exposure to noise is greater than or equal to 82 dBA, regardless of the duration of exposure, shall be provided with personal hearing protection. All personnel who enter designated hazardous noise areas, or who perform tasks where exposure to noise is greater than or equal to 85 dBA or 140 dB peak sound pressure level, regardless of the duration of exposure or number of impulses, shall be provided with and shall be required to wear personal hearing protection.

29.3.3.3 Effectiveness by Noise Attenuation. HPD must attenuate employee noise exposure to a level of 85 dBA (eight-hour TWA) or below. Double hearing protection is required when single hearing protection devices cannot attenuate the noise exposure to 85 dBA 8-hour time TWA). For employees with a previous STS, protectors must attenuate exposure to an eight-hour TWA of 82 dBA. Estimation of the adequacy of hearing-protector attenuation should be performed according to OSHA Technical Manual, section III, chapter 5.

29.3.3.4 Re-evaluation. The adequacy of hearing protector attenuation shall be reevaluated whenever new equipment is used and/or process is changed. (Contact the Occupational Safety, Health and Medical Services Division for assistance.)

29.3.3.5 Earplugs. Various styles of foam and formed earplugs shall be made available to employees in hazardous noise areas. Both disposable and non-disposable earplugs are available. Employees must be instructed in the proper method of insertion, storage, and cleaning of the earplugs.

29.3.3.6 Earplugs (custom). If reusable pre-formed earplugs are used, they will be permanently issued to the employee and fitted to the employee under medical supervision. During fitting, the employee will be instructed in the proper method of insertion, storage, and cleaning of the earplugs.

29.3.3.7 Earmuffs. Earmuffs will be provided for employees when analysis of noise environments shows that the attenuation provided by earplugs is not sufficient to reduce noise exposures below 85 dBA or when muffs are more efficient for the operation. The user shall inspect, store, and clean earmuffs on a regular basis.

29.3.3.8 Special Equipment. Special HPD, such as sound-suppression communication headsets, may be used in hazardous noise areas. These devices shall be inspected regularly. Sound-suppression headsets may not be used if they have been damaged, altered, or modified in any way that affects the attenuation characteristics. If replacement parts (such as ear cup seals) are available, the headsets may be repaired and reused. If sound-suppression headsets are not permanently issued to employees, such equipment must be cleaned and sanitized before re-issuance.

29.3.4 Noise Monitoring

29.3.4.1 Measurement of Exposure--Measurement of potentially hazardous sound levels shall be conducted when any information, observation, or calculation shows that an employee could be exposed to a noise level in excess of 80 dBA over an eight-hour TWA. Any new equipment, operation, job, or procedure with the potential for creating hazardous noise should be evaluated with regard to noise emissions before startup. All continuous, intermittent, and impulsive sound levels from 80 to 140 dBA will be integrated into the noise measurements. Noise exposure computation is shown in Appendix A of 29 CFR 1910.95.

29.3.4.2 Repeated Measurement of Exposure--Noise dosimetry and area monitoring will both be repeated whenever any changes to facilities, equipment, work practices, procedures, or noise-control measures alter potential noise exposures.

29.3.4.3 If there are no changes to facilities, equipment, work practices, or noise control measures, area noise levels shall be verified in accordance with NPR 1800.1 requirements.

29.3.4.4 Noise dosimetry shall be repeated as needed for employees in the HCP.

29.3.4.5 Open Observation. Employees and/or their representatives will be provided an opportunity to observe noise dosimetry and area monitoring activities.

29.3.4.6 Posted Noise Areas. Areas determined to have noise levels at or above 85 dBA-weighted (dBA), or where the environmental impulse noise level is at or above 140 dB peak C-weighted (dBC) or linear, regardless of duration of exposure or number of impulses, shall constitute a hazardous noise area and must be posted as hazardous noise areas.

29.3.4.7 Employee Notification. Affected employees (employees whose exposures have been determined to exceed the Action Level) shall be notified of the results of noise monitoring in writing.

29.4 Audiometric Testing and Medical Evaluation

29.4.1 Whenever an employee is exposed to noise equal to or exceeding the criteria below, as computed without regard to any attenuation provided using HPD, the employee will be enrolled in an HCP:

a. The action level of 82 dBA, as an 8-hour Time Weighted Average (TWA) for 30 or more days in a year.

b. Exposures exceed the limits described in Section 29.2.3 (NPR 1800.1, chapter 4).

c. Civil servants are enrolled in the Ames HCP; contractors are enrolled in their company's HCP.

29.4.2 Baseline Audiogram, Medical Examination, and Medical History. Before being assigned to duties that involve hazardous noise exposure, any employee enrolled in an HCP shall be provided:

a. A baseline audiogram. The audiogram must follow at least 14 hours of no known exposure to sound levels in excess of 82 dBA or to impulsive/impact noise greater than 120 dBA. (This interval should be sufficient to allow recovery from a noise-induced temporary threshold shift.)

b. A medical examination to determine any pre-existing medical pathology of the ear.

c. A medical history review to document occupational and non-occupational noise exposures and ototoxicant exposures.

d. The employee must have no apparent or suspected ear, nose, or throat problem or other medical condition that might compromise the validity of the audiogram. If an employee is determined to have such a condition, the audiogram will be delayed until the condition has abated.

29.4.3 Annual Evaluation. Each annual evaluation shall include an audiogram, an interim history of noise exposures (occupational and non-occupational), a history of ototoxicant exposures, and a history of the use of personal protective equipment (including hearing protection). The employee must have no apparent or suspected ear, nose, or throat problem or other medical condition that might compromise the validity of the audiogram. If an employee is determined to have such a condition, the audiogram will be delayed until the condition has abated.

29.4.4 Initial Audiogram after Placement. When it is discovered that an employee has been working in a hazardous noise area or where noise exposures exceed the Action Level, but that employee has not had a physical examination with audiogram, one shall be conducted within 30 days.

29.4.5 Acute Disease of the Ear. Personnel who suffer from acute diseases of the ear shall not be placed in hazardous noise areas until the condition has abated, particularly if such diseases preclude the wearing of hearing protectors, cause hearing impairment, or produce tinnitus.

29.4.6 Final Audiogram and Termination of Employment. All ARC employees who have participated in the HCP shall be provided a final audiometric examination upon termination of employment with ARC, job changes within the installation that would alter noise exposure, transfer to another installation, or retirement. An annual audiogram, if completed within 6 months of the termination, transfer, or retirement date, may be substituted for the final audiogram.

29.5 Audiometric Evaluation

29.5.1 Evaluation of Annual Audiogram

29.5.1.1 Physician Review. A physician or other qualified person shall compare the annual audiogram with the employee's baseline audiogram to determine if it is valid and if an STS has occurred. It is desirable to review the employee's audiogram record for patterns of change over time.

a. Effects of Aging. When determining whether an STS has occurred, allowances for the effects of aging to the hearing threshold level may be made using the procedure described in 29 CFR 1910.95, Appendix F and the most appropriate population-based age adjustment tables as determined by the physician or audiologist (e.g., Population-Based Age Adjustment Tables for Use in Occupational Hearing Conservation Programs, International Journal of Audiology, Volume 59, Supplement 1, S20-S30).

b. ASA-ANSI Conversion. Audiograms referenced to ASA-1951 must be converted to ANSI S3.6-1969 before hearing threshold levels can be properly determined.

29.5.1.2 Discovering an STS. When evaluation of an audiogram indicates an STS, a retest shall be scheduled within 30 days to determine if the shift is temporary or permanent. A medical evaluation may be warranted at this time to determine if an acute medical condition is a contributing factor. The retest must be proceeded by a period of at least 14 hours without exposure to noise above 82 dBA.

29.5.1.3 Persistent STS. If the retest indicates a PTS, the employee may be referred for further medical evaluation. Medical evaluation is required to validate the existence of a noise induced PTS and to determine if further medical referral is indicated. A physician shall determine if the PTS is work-related or aggravated by occupational noise exposure.

29.5.1.4 New Baseline (Reference) Audiogram. A new reference audiogram shall replace the current reference audiogram when the medical evaluation confirms that an STS is permanent.

a. Follow-up. Any employee assigned a new baseline audiogram shall be scheduled for retest in 6 months to determine if further hearing threshold shifts have occurred. The employee will be encouraged to use hearing protection for any activities (occupational and non-occupational) that involve hazardous noise exposures.

b. Substitutions. An annual audiogram shall be substituted for the baseline when, in the judgment of the audiologist, otolaryngologist, or physician who is evaluating the audiogram, the hearing threshold shown on the annual audiogram indicates significant improvement over the baseline audiogram.

c. Fitness and Risk Evaluation. When a new baseline is established, a fitness for duty assessment will also be performed to ensure the reduced level of hearing does not pose a substantial risk to personal safety, public safety, or mission success.

29.5.1.5 Repeated STS and Employee Reassignment. Employees who experience a repeated STS, after having a new baseline established, shall have a fitness and risk assessment before returning to work in a hazardous noise area.

29.5.2 Criteria for Referral to an Audiologist

29.5.2.1 The Ames Health Unit may refer an employee to an audiologist or otolaryngologist for more comprehensive testing if any of these criteria are met:

a. Average hearing threshold level greater than 25 dB at 500, 1000, 2000 and 3000Hz in either ear.

b. Difference in average hearing threshold level between the better and poorer ear of more than 15 dB at 500, 1000, and 2000 Hz.

c. Reduction in hearing threshold level in either ear from the baseline or previous monitoring audiogram of more than 15 dB at 500, 1000, or 2000 Hz; or more than 20 dB at 3000, 4000, or 6000 Hz.

d. Variable or inconsistent responses or unusual hearing-loss.

29.5.3 Criteria for Medical Referral

29.5.3.1 If the Ames Health Unit does not have the internal resources to diagnose or treat a detected or potential illness or prefers, for other reasons, to refer an employee to another medical professional for evaluation or treatment, it may do so. The medical criteria for referral to a qualified physician or otolaryngologist for more comprehensive testing/examination include:

a. The presence and persistence of (or a history of) these conditions within the last 12 months:

(1) Ear pain

(2) Ear drainage

(3) Dizziness

(4) Severe persistent tinnitus

(5) Sudden, fluctuating, or rapidly progressive hearing loss

(6) A feeling of fullness or discomfort in one or both ears

(7) Unusual or inconsistent audiometric findings

b. When it is suspected that a medical pathology of the ear is caused or aggravated by the wearing of HPD.

c. When it is suspected that a medical pathology of the ear is unrelated to the use of HPD, the employee will be informed of the need for an otological examination.

29.6 Noise Hazard Warning Signs

29.6.1 Noise hazard warning signs shall:

a. Clearly indicate a hazard of high noise levels and the requirements to wear hearing protection.

b. Be posted at the entrance(s) to, and at the perimeter of, all noise hazard areas.

c. Be affixed (as decals) to power tools and equipment that produce hazardous noise levels, unless used only in posted hazardous noise areas.

d. Have wording in black letters on a yellow background. Having wordings similar to the example provided in section 29.9.1.

29.7 Employee Training

29.7.1 Each employee who participates in the HCP shall receive annual training that includes:

a. An overview of the ARC HCP.

b. A review of the effects of noise on hearing (including permanent hearing loss).

c. Noise control principles (engineering, administrative, HPD).

d. The purpose, advantages, disadvantages, and attenuation characteristics of various types of HPD.

e. Instruction on selection, fitting, use, storage, and care of HPD.

f. An explanation of audiometric testing and its purpose.

29.7.2 Personnel will be encouraged to use HPD when exposed to hazardous noise in non-occupational settings (e.g., from lawn mowers, firearms, tools).

29.8 Records Maintenance and OSHA Recording

29.8.1 Permanent Records. Audiograms and noise-exposure records shall be maintained as a permanent part of employee health records. If noise-exposure measurement records are representative of the exposures of other employees participating in the HCP, the range of noise levels and the average noise dose will be made a permanent part of the other employees' health records as well.

29.8.2 Contents of Employee Health Records. In addition to audiometric test data, each employee health record will, at a minimum, identify:

a. The audiometric reference level to which the audiometer was calibrated at the time of testing

b. The date of the last calibration of the audiometer

c. The examiner's name and position

d. The name, the identification number, and job classification of the employee tested

e. The employee's most recent noise exposure assessment

29.8.3 Audiometric Test Room. Accurate records of the background sound-pressure levels in the audiometric test rooms, and data and information concerning calibration and repair of sound-measuring equipment and audiometers (as well as all audiometric test data), will be maintained for the duration of the affected employee's employment, plus 30 years.

29.8.4 Industrial Hygiene and Control Methods. Accurate records of noise surveys/monitoring, results of special noise studies, and records of special actions or engineering controls installed to control noise exposures will be maintained for the duration of the affected employee's employment, plus 30 years.

29.8.5 OSHA Recordable Hearing Loss. If an employee's hearing test (audiogram) reveals that the employee has experienced a work-related 10 dB STS in hearing in one or both ears, and the employee's hearing threshold is 25 dB or more above audiometric zero (average at 2000, 3000, and 4000 Hz) in the same ear(s) as the STS, then an occupational illness (noise-induced hearing loss) must be recorded on the OSHA 300 Log, unless the STS is not confirmed by a retest done within 30 days.

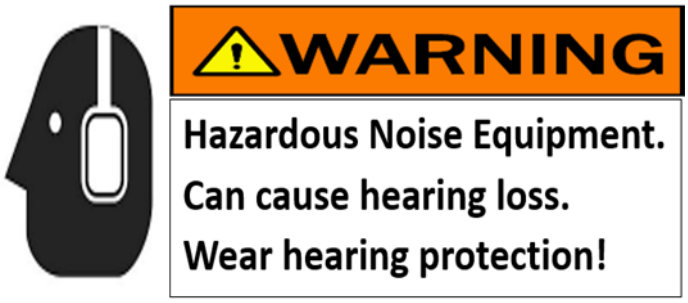
29.8.5.1 If an STS is detected, a retest should be performed on the employee's hearing within 30 days of the first test. If the retest does not confirm the recordable STS, then recording the hearing loss case on the OSHA 300 Log is not required. However, if the retest confirms the recordable STS, the hearing loss case must be recorded within seven (7) calendar days of the retest.

29.9 Signs and Decals

29.9.1 Noise Hazard Warning Sign Specifications

Warning signs should contain Signal Words (such as: Warning, Caution, Danger, Notice, or Safety Instructions), safety alert symbols, and a word message (which should include, the hazard, action to address the hazard, and result of exposure to the hazard if appropriate action is not taken). For further details, refer to ANSI Z535.2, Environmental and Facility Safety Signs.

29.9.2 Example of a Noise Hazard Warning Sign



APPENDIX A. DEFINITIONS

Signal Words

Signal words: The words used in the signal word panel. The signal words for hazard alerting signs are “DANGER,” “WARNING,” and “CAUTION.” Safety notice signs use the signal word “NOTICE.”
Safety instruction signs use signal words that are specific to the situation. Safety and fire equipment location signs may use signal words that identify the equipment.

- DANGER: Indicates a hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.
- WARNING: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
- CAUTION: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
- NOTICE: Indicates information considered important but not hazard-related. The safety alert symbol shall not be used with this signal word. For environmental/facility signs, NOTICE is typically the choice of signal word for messages relating to property damage, security, sanitation, and housekeeping rules.
- SAFETY INSTRUCTIONS: The signal word SAFETY INSTRUCTIONS or its equivalent shall be in safety white letters on a safety green background.

APPENDIX B. ACRONYMS

ANSI	American National Standards Institute
APR	Ames Procedural Requirement
ARC	Ames Research Center
COR	Contracting Officer's Representative
DART	Disaster Assistance and Rescue Team
dB	Decibel
HCP	Hearing Conservation Program
HPD	Hearing Protection Device
Hz	Hertz
NPR	NASA Procedural Requirement
OSHA	Occupational Safety and Health Administration
PTS	Permanent Threshold Shift
SLM	Sound Level Meter
STS	Standard Threshold Shift
TWA	Time-Weighted Average

APPENDIX C. REFERENCES

C.1 ANSI Z535.2-2011, Environmental and Facility Safety Signs