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Asserting our right "...to petition the Government for redress of grievances."  
Amendment I, U.S. Constitution, Dec. 15, 1791

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## REPORT TO CONGRESS – PROTECTING OUR MARINERS’ HEARING

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### INTRODUCTION

**Request to Members of Congress: Our Association asks Congress to provide the limited-tonnage merchant mariners we represent with the same hearing protection afforded to American industrial workers under OSHA Regulations at 29 CFR §1910.95.**

**Deafness** is defined as an inability to hear. This simple definition gives no real impression of how deafness affects function in society for a hearing impaired person. An estimated 20,000,000 Americans have impaired hearing to some degree. This condition affects all age groups with consequences ranging from minor to severe.

Approximately 2,000,000 Americans are considered profoundly deaf. This group has such a severe hearing loss that they cannot benefit from mechanical amplification by devices called hearing aids. However, many “hard-of-hearing” persons often can benefit in varying degrees from hearing aids ranging in cost from about \$300 to \$5,000.

There are four types of hearing loss as follows:

- **Conductive hearing loss** is caused by diseases or obstructions in the outer or middle ear and usually is not severe in that such a person generally can use a hearing aid to advantage or may be helped with medical or surgical treatment.
- **Sensorneural hearing loss** results from damage to the sensory hair cells or nerves of the inner ear and can range in severity from mild to profound deafness. This type of deafness occurs in certain sound frequencies more than in others resulting in distorted perception of sounds even when the sound “volume” is turned up. A hearing aid may help a person with sensorneural hearing loss.
- **Mixed hearing loss** results from problems in the outer and the inner ear.
- **Central hearing loss** is the result of damage to or impairment of nerves or nuclei of the central nervous system.

Deafness can be caused by injury or accident or it may be inherited. Continuous or frequent exposure to noise levels above 85 decibels (dB) can cause a progressive and eventually severe sensorneural hearing loss – a fact that the Coast Guard is well aware of.

### HEARING LOSS AFFECTS OUR MARINERS CREDENTIALS AND JOBS

The Coast Guard is entrusted by Congress with general superintendence over the vessels and personnel of the U.S. merchant marine.<sup>(1)</sup> [<sup>(1)</sup>46 U.S. Code §2103.]

On June 2, 1982 the Coast Guard published Navigation and Vessel Inspection Circular (NVIC) 12-82 titled Recommendations on Control of Excessive Noise. This guidance document was based in large measure on the International Maritime Organization’s Resolution A.468(XII) Code on Noise Levels on Board Ships. The

recommendations in NVIC 12-82 applied to “all commercial vessels inspected by the Coast Guard except Mobile Offshore Drilling Units.” In addition, “The Coast Guard considers them to be appropriate **guidelines** should any owner of uninspected vessels also choose to follow them.” The point is that this document was a **set of guidelines and not regulations** – a critical difference for our mariners. Nevertheless, and make no mistake about it; this was a very impressive set of guidelines.

A mariner has little to offer an employer if he does not have his health. One major aspect of a mariner's health, his quality of life, and his ability to perform his job depends on his ability to hear properly. A mariner whose hearing is impaired by workplace conditions will experience a generally reduced quality of life and faces significant future medical expenses to adjust to the problem. He may also face rejection for further service in the merchant marine service if he cannot pass the hearing portion of an **entry or renewal** physical exam – a fact that became much more significant as a result of tightened medical qualifications since 2008. In addition, as a mariner ages, he may require hearing aids whose costs are often significant and are not covered by Medicare.

## THE COAST GUARD CONTROLS OUR MARINERS' WORKPLACE SAFETY AND HEALTH

**One aspect of an industry-wide problem.** In Coast Guard Docket #1998-3868, the Coast Guard proposed the first major revision of Outer Continental Shelf (OCS) regulations in 20 years. In this regulatory proposal, they included in a proposed regulation at 33 CFR §142.235 and §142.240 that a "noise survey" in accordance with ANSI Standard S1.13-1995 and S1.36-1990 or with IMO Resolution A.468(XII) be performed. They also proposed to require posting signs warning of noise hazards.

Proposed 33 CFR §142.200 indicates that sections .234 and .240 relate to the general working conditions on "OCS units" that included “vessels.” The proposed list of vessels in §33 CFR 140.5 and §33 CFR 146.1 clearly included offshore supply vessels (OSV) but omitted any direct reference to the many uninspected towing vessels that work on or transit across the outer continental shelf. In 2000, our Association specifically asked the Commandant (G-MSO-2) to clarify this matter in writing but never received a reply!

### We believe these points are significant:

- The Coast Guard is the lead Federal agency for workplace safety and health on facilities and vessels engaged in exploration for, or development, or production of mineral resources on the OCS.
- This particular regulation was proposed in 1999 and was the first major revision of OCS regulations in 20 years. The proposed regulation never became a Final Rule and, consequently, there are no enforceable hearing conservation regulations that apply to our mariners working on the OCS.
- However, this proposed regulation focused attention to the lack of hearing conservation regulations on all waters. However, it also focused attention on the type of regulations that a very experienced and dedicated Coast Guard regulator believed was important to promulgate. Our Association followed the (lack of) progress of this regulatory package on the agenda at NOSAC meetings for 10 years.
- Proposed towing vessel regulations in 2011 (ten years later) never provided the hearing conservation regulations sought by our mariners.<sup>(1)</sup> [<sup>(1)</sup>Refer to NMA Report #R-276, Rev. 10, Item #2-1, pgs. 7,8.]
- The proposed OCS regulations, **even if enacted**, would have provided far fewer workplace protections for our mariners than in workplaces ashore. A comparison between the protections offered our mariners and those available to shoreside workers performing comparable industrial tasks illustrates an entire area that Coast Guard marine safety officials overlooked for years.<sup>(1)</sup> [<sup>(1)</sup>Refer to NMA Report #R-202-B]

## THE NATURE OF OUR MARINERS COMPLAINTS

The Occupational Safety and Health Act effectively protects the safety and health of workers in other occupations and has done so since 1970. Unfortunately, the task of developing and enforcing comparable regulations for mariners was left to the Coast Guard. We believe they have done an unacceptably poor job of protecting our mariners. The more we speak with OSHA<sup>(1)</sup> representatives at various levels of government, the more this reinforces our view. [<sup>(1)</sup>OSHA is an agency of the U.S. Department of Labor whereas the Coast Guard is an agency of the U.S. Department of Homeland Security.]

Many years ago, OSHA developed Occupational Noise Exposure regulations at 29 CFR §1910.95. Unlike the regulations the Coast Guard proposed for the Outer Continental Shelf in 1999, these regulations called for more than an "administrative control" of posting signs in high noise areas. They also included a continuing and effective **hearing conservation program** for the benefit of employees at 29 CFR §1910.95(c).

The hearing conservation program included monitoring, employee hazard notification, observation of monitoring by worker representatives, an audiometric testing program, training, record keeping, and provision for record transfers to follow each employee from job to job. This is particularly important in an industry that has a high turnover rate and that treats many of its employees as expendable – an attitude our Association has a fundamental disagreement with. The start-up date of the OSHA hearing protection regulations was March 1, **1984** – almost 30 years ago! Why have our mariners been left behind?

While workers in workplaces ashore were protected by OSHA hearing conservation regulations all these years, we ask cognizant members of Congress why the Coast Guard has done absolutely nothing to protect the hearing of the limited-tonnage merchant mariners our Association represents. What's more, the limited measures they proposed back in 1999<sup>(1)</sup> applied only to workers on the outer continental shelf and, at that, the proposed regulations only applied to an ill-defined segment of mariners whose employers' trade association effectively defeated the measure while crying about the expense with nary a thought for the mariners that would be deafened. [<sup>(1)</sup>Docket #USCG 1998-3868.]

Our complaint extends far beyond the mariners who work on the Outer Continental Shelf to **all lower-level mariners** under Coast Guard regulatory supervision. We believe that the Coast Guard has completely and utterly failed to provide any effective degree of hearing protection for an estimated 126,000 limited-tonnage merchant mariners.

## A HISTORY OF NEGLECT, INACTION, AND PASSING THE BUCK

On June 2, 1982 the Coast Guard published Navigation and Vessel Inspection Circular #12-82 titled Recommendations on Control of Excessive Noise. This technical document contained the Coast Guard's recommended "guidelines" to the U.S. maritime industry for addressing conditions of high noise. **This document shows that the Coast Guard was fully aware of the noise problem and of the scientific literature, testing standards, and international significance of this matter many years ago.** In the same time period, the International Maritime Organization published IMO Resolution A.468(XII) titled Code on Noise Levels On Board Ships.

The Coast Guard not only participated in the development of this code but also endorsed its recommendations. Portions of that document are cited in NVIC 12-82 that is still listed as a current NVIC. Whereas, the IMO resolution applied only to ships greater than 1,600 gross tons **our concern is for mariners on vessels of less than 1,600 gross tons** regardless of the type of vessel they serve on or the waters where the vessel operates. While the Coast Guard exhibited an excellent grasp of the technical problems involved, they utterly failed to grasp that this was clearly a human problem and not simply an "engineering" problem. The Coast Guard still has not received the message that part of the responsibility for hearing conservation is theirs although they have worked with great diligence since 2008 to turn down mariner for credential renewals who cannot attain their hearing qualifications.

The NVIC<sup>(1)</sup> states in pertinent part: "The Coast Guard realizes that reducing noise levels generally becomes increasingly more difficult on smaller vessels...On many existing vessels of less than 500 gross tons,<sup>(2)</sup> the incorporation of effective structural and engineering alterations to attenuate structure-borne noise may be economically prohibitive. However, through the use of hearing protective devices, administrative controls and selective engineering changes, the recommended 24-hour exposure limit...should still be attainable." **That passage was written almost 30 years ago...the effective lifetime of many steel vessels! Had they addressed the problem then, there might be no reason to address the problem today.** [<sup>(1)</sup>NVIC 12-82, paragraph 4.b.5. <sup>(2)</sup>At the time the NVIC was written, all offshore supply vessels were less than 500 gross tons as are most uninspected towing vessels and small passenger vessels crewed by our "limited-tonnage" merchant mariners.]

Our Association pointedly disagrees with the statement<sup>(1)</sup> that: "The Coast Guard believes therefore, that the recommendations in this circular are a satisfactory implementation of the IMO Code." We believe that what was called for at the time the NVIC was issued was nothing short of federal rulemaking initiative – a regulatory product similar to the rulemaking adopted by OSHA during this time frame that appears in updated form as 29 CFR §1910.95. **We believe that the Coast Guard's failure to write or adopt comparable regulations adversely affected the hearing of more than a generation of limited-tonnage merchant mariners during the period 1982-2012 and must not be allowed to continue unchecked.** The number includes those who are considered more or less as permanent employees as well as temporary members of the workforce who pass through the engine rooms, machinery spaces, and other high noise areas in the marine industry and who contribute to the industry's high turnover rate. We further believe that the industry and the Coast Guard both contributed to this high turnover rate by failing to protect mariners' health and safety in the workplace in other ways and suggest that changes are long overdue.

## THE MARINE SAFETY MANUAL EXPLAINS COAST GUARD PROGRAMS AND POLICIES

The Marine Safety Manual is a multi-volume internal document that describes in great detail for the benefit of Coast Guard and industry personnel the purpose of various Coast Guard programs and how they should be conducted. This is a "living document" in that it is one that is constantly undergoing change. When we first explored the problem of hearing protection for mariners in 2001 we quoted from a number of passages in Marine Safety Manual, Volume 2, Materiel Inspection, as follows:

Marine Safety Manual, Volume 2, paragraph 9.p.9.a. stated: "The problem of excessive noise on commercial vessels and offshore drilling and production units has been the focus of an ongoing Coast Guard-sponsored study." Under the Freedom of Information Act (FOIA), our Association requested a copy of that study as well as a statement of when that study was initiated, the contributors to the study, and its current status. We never received a response.

The Marine Safety Manual, Volume 2, paragraphs 9.p.9.b. stated: "Previously, the Coast Guard dealt with maritime noise problems through existing regulations, in a general way or on a case-by-case basis. For example, 46 CFR §72.20-5 and §92.20-5 require accommodations aboard vessels to be insulated from undue noise. Similarly, 46 CFR §32.40-15 requires tankships and manned tank barges to have crew's quarters suitable for the accommodation and protection of the crew..." 46 CFR §92.20-5 is typical and merely states: "It is the intent of this subpart that the accommodations provided for officers and crew on all vessels must be securely constructed, properly lighted, heated, drained, ventilated, equipped, located, arranged, and insulated from undue noise, heat, and odors."

We note that there are currently no regulations listed under "noise" or "hearing protection" in any of the regulations that protect our limited-tonnage mariners. This includes regulations for includes offshore supply vessels, small passenger vessels, and towing vessels.

The Marine Safety Manual, Volume 2, paragraph 9.p.9.c. stated: "Its (NVIC #12-82) two major recommendations are a 24-hour noise exposure limit of 82 dB(A)<sup>(1)</sup> for all personnel, and a periodic audiometric examination of all personnel exposed to noise levels above a certain low exposure level of 77 dB(A)..." [<sup>(1)</sup>**Vocabulary: dB or db = Decibel is a unit that describes the intensity of a sound wave.**]

We asked the Coast Guard for a cogent explanation of why an audiometric examination is contained in current OSHA rules while it was not included in the proposed rules for the Outer Continental Shelf, specifically in proposed 33 CFR §142.235 and §142.240. If failing to include these provisions in the proposed regulation was an oversight, we asked the Coast Guard Project Officer to add it to the rulemaking package OR undertake a new rulemaking project to protect our mariners' hearing in line with the current OSHA rules. The request was ignored.

The Marine Safety Manual, Volume 2, paragraph 9.p.9.d. stated: "The policy in NVIC 12-82 is based on the expectation that the maritime industry will voluntarily implement and maintain an effective noise control program, without direct Coast Guard involvement. The policy was developed with the assistance of industry and the Commandant anticipates its wide implementation." As a result of this statement, we asked for a copy of all documents from June 2, 1982 (the date of publication of NVIC #12-82) to the present date that show the history of this "voluntary implementation" by industry and any conclusions concerning its success or failure – but received nothing!

We noted that Marine Safety Manual, Volume 2, paragraph 9.p.9.f called for a "Program Review" containing feedback from field units relating noteworthy experiences and observations of noise conditions and actions. Such reports and questions concerning NVIC 12-82 should be directed to Commandant (G-MVI-2)." Our Association requested copies of all such feedback under FOIA but received nothing.

The Marine Safety Manual, Volume 2, paragraph 9.p.9.d. stated in a note that: "Complaints alleging that crew members have suffered hearing loss from long-term exposure to excessive noise shall not be considered as reportable marine casualties involving personal injury." We believe that this comment (with its emphasis on the word "not") was not only unnecessary but served to diminish the importance of hearing loss in the eyes of Coast Guard inspectors and management – the two groups most likely to have access to the Marine Safety Manual. The following paragraph only exacerbates the matter.

The Marine Safety Manual, Volume 2, paragraph 9.p.9.e. "Handling Complaints" stated that: "If a crew member files a written complaint to eliminate a specific noise hazard, the situation should be evaluated and all discrepancies corrected. However, these measures should be taken only by the vessel owner, upon request by the OCMI. Only when the OCMI has reason to question the owner's evaluations should inspection personnel become involved in noise measurement."

We wish to point out that in the real world of our limited-tonnage mariners if a crew member has the temerity to file a "written complaint" with the Coast Guard he most likely would be fired. This is because most of our mariners are "employees-at-will" and can be terminated by their employers for any reason whatsoever. This policy effectively removes Coast Guard inspectors, those closest to only those mariners serving on inspected vessels and most likely to hear a verbal complaint, from investigating any "noise" problems on any inspected vessel.

Coast Guard inspectors only visit vessels briefly and rarely while they are underway – with the exception of "sea-trials" prior to issuing an original Certificate of Inspection. They are not forced to live with excessive noise and vibration on a 24-hour-a-day basis as do the mariners who work on these vessels. This limits the inspector's viewpoint in that it considers only the position of management without considering the mariners who are most impacted by noise pollution. Consequently, this explains why our Association was interested in ascertaining who, if anyone, ever represented the interests of our limited-tonnage mariners on the hearing conservation issue since it was the working mariners' hearing and quality of life that were most at stake. We assume that any such representation, if it existed, took place at a Federal advisory committee meeting and asked for copies of minutes taken from pertinent meetings and comments of those directly representing the interests of lower-level mariners at these meetings – and received nothing!

We also asked for information on noise attenuation requirements on Coast Guard vessels of between 100 feet and 200 feet in length that are presently under construction and copies of any "hearing conservation programs" currently in effect for enlisted mariners serving on these new vessels. For this request, we received a copy of COMDTINST M5100.47 containing a well-developed hearing conservation program that the Coast Guard developed for its own personnel. This program is comparable to the OSHA hearing protection regulations adopted in 1985.

Why do our mariners NOT have comparable protection? Judging by the following editorial comment in the March 31, 1982 copy of the Offshore Marine Service Association (OMSA) Newsletter, it may have been because of industry

opposition to the costs involved and their ability to influence the Coast Guard without anyone there to present the mariners' point of view: "Don't let the word "Recommendation" or the fact that these recommended standards are not published as regulations fool you. The Association believes that these so-called guidelines may have the most serious impact on this industry than any other recent event."

**THE COAST GUARD'S HANDLING OF OUR FOIA REQUESTS**

Coast Guard Headquarters responded to our FOIA request as follows:

"This letter is in response to your Freedom of Information Act (FOIA) request of July 21, 2001, concerning workplace safety and health issues involving noise levels and hearing loss.

"In addition to asking for information under the FOIA, your letter asked for answers to specific questions. Much of the information you requested is from several years ago, and we may or may not be able to locate it. Some of the material is no longer required to be maintained. We will provide a more detailed response with all releasable FOIA documents when available. However, based on our initial efforts and an estimate of the time necessary to complete your request, we will need to receive payment in the amount of \$281.88 before we can complete your request. If it appears that the time necessary is any greater than our initial enclosed estimate, we will contact you with any further expected costs...If you do not respond within thirty days after the date of this letter we will assume that you are no longer interested in obtaining this information." s/ M.A. Prescott, Chief, Vessel and Facility Operating Standards Division.

We chose not to spend the money to further determine the History of a matter that has been dead for many years. Instead, we chose to look at meaningful, modern regulations drafted by another agency of the U.S. Government, namely OSHA. Without pointing fingers, we believe that inadequate representation by mariners vis-a-vis "management"—possibly at the Federal advisory committee level—led the Coast Guard to sacrifice the interests of our limited-tonnage mariners they are supposed to superintend. It is for this reason that we ask Congress to look into this matter.

**OSHA REGULATIONS COVER OCCUPATIONAL NOISE EXPOSURE**  
(29 CFR §1910.95)

**29 CFR §1910.95 Occupational Noise Exposure.**

(a) Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in Table G-16 when measured on the A scale of a standard sound level meter at slow response. When noise levels are determined by octave band analysis, the equivalent A-weighted sound level may be determined as follows:

**Table G-16—Permissible Noise Exposures<sup>(1)</sup>**

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

<sup>(1)</sup>When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions:  $C_1/T_1 + C_2/T_2$  Cn/Tn exceeds unity, then, the mixed exposure should be considered to exceed the limit value. Cn indicates the total time of exposure at a specified noise level, and Tn indicates the total time of exposure permitted at that level.

Equivalent sound level contours. Octave band sound pressure levels may be converted to the equivalent A-weighted sound level by plotting them on this graph and noting the A-weighted sound level corresponding to the point of highest penetration into the sound level contours. This equivalent A-weighted sound level, which may differ from the actual A-weighted sound level of the noise, is used to determine exposure limits from Table 1.G-16.

(b)(1) When employees are subjected to sound exceeding those listed in Table G-16, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table G-16, personal protective equipment shall be provided and used to reduce sound levels within the levels of the table.

(b)(2) If the variations in noise level involve maxima at intervals of 1 second or less, it is to be considered continuous. Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

(c) Hearing conservation program.

(c)(1) The employer shall administer a continuing, effective hearing conservation program, as described in paragraphs (c) through (o) of this section, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of fifty percent. For purposes of the hearing conservation program, employee noise exposures shall be

computed in accordance with Appendix A and Table G-16a, and without regard to any attenuation provided by the use of personal protective equipment.

(c)(2) For purposes of paragraphs (c) through (n) of this section, an 8-hour time-weighted average of 85 decibels or a dose of fifty percent shall also be referred to as the action level.

(d) Monitoring. (1) When information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 decibels, the employer shall develop and implement a monitoring program.

(d)(1)(i) The sampling strategy shall be designed to identify employees for inclusion in the hearing conservation program and to enable the proper selection of hearing protectors.

(d)(1)(ii) Where circumstances such as high worker mobility, significant variations in sound level, or a significant component of impulse noise make area monitoring generally inappropriate, the employer shall use representative personal sampling to comply with the monitoring requirements of this paragraph unless the employer can show that area sampling produces equivalent results.

(d)(2)(i) All continuous, intermittent and impulsive sound levels from 80 decibels to 130 decibels shall be integrated into the noise measurements.

(d)(2)(ii) Instruments used to measure employee noise exposure shall be calibrated to ensure measurement accuracy.

(d)(3) Monitoring shall be repeated whenever a change in production, process, equipment or controls increases noise exposures to the extent that:

(d)(3)(i) Additional employees may be exposed at or above the action level; or

(d)(3)(ii) The attenuation provided by hearing protectors being used by employees may be rendered inadequate to meet the requirements of paragraph (j) of this section.

(e) Employee notification. The employer shall notify each employee exposed at or above an 8-hour time-weighted average of 85 decibels of the results of the monitoring.

(f) Observation of monitoring. The employer shall provide affected employees or their representatives with an opportunity to observe any noise measurements conducted pursuant to this section.

(g) Audiometric testing program. (1) The employer shall establish and maintain an audiometric testing program as provided in this paragraph by making audiometric testing available to all employees whose exposures equal or exceed an 8-hour time-weighted average of 85 decibels.

(g)(2) The program shall be provided at no cost to employees.

(g)(3) Audiometric tests shall be performed by a licensed or certified audiologist, otolaryngologist, or other physician, or by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation, or who has satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid audiograms, and properly using, maintaining and checking calibration and proper functioning of the audiometers being used. A technician who operates microprocessor audiometers does not need to be certified. A technician who performs audiometric tests must be responsible to an audiologist, otolaryngologist or physician.

(g)(4) All audiograms obtained pursuant to this section shall meet the requirements of Appendix C: Audiometric Measuring Instruments.

(g)(5) Baseline audiogram. (i) Within 6 months of an employee's first exposure at or above the action level, the employer shall establish a valid baseline audiogram against which subsequent audiograms can be compared.

(g)(5)(ii) Mobile test van exception. Where mobile test vans are used to meet the audiometric testing obligation, the employer shall obtain a valid baseline audiogram within 1 year of an employee's first exposure at or above the action level. Where baseline audiograms are obtained more than 6 months after the employee's first exposure at or above the action level, employees shall wear hearing protectors for any period exceeding six months after first exposure until the baseline audiogram is obtained.

(g)(5)(iii) Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise. Hearing protectors may be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise.

(g)(5)(iv) The employer shall notify employees of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the audiometric examination.

(g)(6) Annual audiogram. At least annually after obtaining the baseline audiogram, the employer shall obtain a new audiogram for each employee exposed at or above an 8-hour time-weighted average of 85 decibels.

(g)(7) Evaluation of audiogram. (i) Each employee's annual audiogram shall be compared to that employee's baseline audiogram to determine if the audiogram is valid and if a standard threshold shift as defined in paragraph (g)(10) of this section has occurred. This comparison may be done by a technician.

(g)(7)(ii) If the annual audiogram shows that an employee has suffered a standard threshold shift, the employer may obtain a retest within 30 days and consider the results of the retest as the annual audiogram.

(g)(7)(iii) The audiologist, otolaryngologist, or physician shall review problem audiograms and shall determine whether there is a need for further evaluation. The employer shall provide to the person performing this evaluation the following information:

(g)(7)(iii)(A) A copy of the requirements for hearing conservation as set forth in paragraphs (c) through (n) of this section;

(g)(7)(iii)(B) The baseline audiogram and most recent audiogram of the employee to be evaluated;

(g)(7)(iii)(C) Measurements of background sound pressure levels in the audiometric test room as required in

Appendix D: Audiometric Test Rooms.

(g)(7)(iii)(D) Records of audiometer calibrations required by paragraph (h)(5) of this section.

(g)(8) Follow-up procedures. (i) If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift as defined in paragraph (g)(10) of this section has occurred, the employee shall be informed of this fact in writing, within 21 days of the determination.

(g)(8)(ii) Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, the employer shall ensure that the following steps are taken when a standard threshold shift occurs:

(g)(8)(ii)(A) Employees not using hearing protectors shall be fitted with hearing protectors, trained in their use and care, and required to use them.

(g)(8)(ii)(B) Employees already using hearing protectors shall be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.

(g)(8)(ii)(C) The employee shall be referred for a clinical audiological evaluation or an otological examination, as appropriate, if additional testing is necessary or if the employer suspects that a medical pathology of the ear is caused or aggravated by the wearing of hearing protectors.

(g)(8)(ii)(D) The employee is informed of the need for an otological examination if a medical pathology of the ear that is unrelated to the use of hearing protectors is suspected.

(g)(8)(iii) If subsequent audiometric testing of an employee whose exposure to noise is less than an 8-hour TWA of 90 decibels indicates that a standard threshold shift is not persistent, the employer:

(g)(8)(iii)(A) Shall inform the employee of the new audiometric interpretation; and

(g)(8)(iii)(B) May discontinue the required use of hearing protectors for that employee.

(g)(9) Revised baseline. An annual audiogram may be substituted for the baseline audiogram when, in the judgment of the audiologist, otolaryngologist or physician who is evaluating the audiogram:

(g)(9)(i) The standard threshold shift revealed by the audiogram is persistent; or

(g)(9)(ii) The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

(g)(10) Standard threshold shift. (g)(1) As used in this section, a standard threshold shift is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear.

(g)(1)(ii) In determining whether a standard threshold shift has occurred, allowance may be made for the contribution of aging (presbycusis) to the change in hearing level by correcting the annual audiogram according to the procedure described in Appendix F: Calculation and Application of Age Correction to Audiograms.

(h) Audiometric test requirements. (1) Audiometric tests shall be pure tone, air conduction, hearing threshold examinations, with test frequencies including as a minimum 500, 1000, 2000, 3000, 4000, and 6000 Hz. Tests at each frequency shall be taken separately for each ear.

(h)(2) Audiometric tests shall be conducted with audiometers (including microprocessor audiometers) that meet the specifications of, and are maintained and used in accordance with, American National Standard Specification for Audiometers, S3.6-1969, which is incorporated by reference as specified in §1910.6.

(h)(3) Pulsed-tone and self-recording audiometers, if used, shall meet the requirements specified in Appendix C: Audiometric Measuring Instruments.

(h)(4) Audiometric examinations shall be administered in a room meeting the requirements listed in Appendix D: Audiometric Test Rooms.

(h)(5) Audiometer calibration. (i) The functional operation of the audiometer shall be checked before each day's use by testing a person with known, stable hearing thresholds, and by listening to the audiometer's output to make sure that the output is free from distorted or unwanted sounds. Deviations of 10 decibels or greater require an acoustic calibration.

(h)(5)(ii) Audiometer calibration shall be checked acoustically at least annually in accordance with Appendix E: Acoustic Calibration of Audiometers. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this check. Deviations of 15 decibels or greater require an exhaustive calibration.

(h)(5)(iii) An exhaustive calibration shall be performed at least every two years in accordance with sections 4.1.2; 4.1.3.; 4.1.4.3; 4.2; 4.4.1; 4.4.2; 4.4.3; and 4.5 of the American National Standard Specification for Audiometers, S3.6-1969. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this calibration.

(i) Hearing protectors. (1) Employers shall make hearing protectors available to all employees exposed to an 8-hour time-weighted average of 85 decibels or greater at no cost to the employees. Hearing protectors shall be replaced as necessary.

(i)(2) Employers shall ensure that hearing protectors are worn:

(i)(2)(i) By an employee who is required by paragraph (b)(1) of this section to wear personal protective equipment; and

(i)(2)(ii) By any employee who is exposed to an 8-hour time-weighted average of 85 decibels or greater, and who:

(i)(2)(ii)(A) Has not yet had a baseline audiogram established pursuant to paragraph (g)(5)(ii); or

(i)(2)(ii)(B) Has experienced a standard threshold shift.

(i)(3) Employees shall be given the opportunity to select their hearing protectors from a variety of suitable hearing protectors provided by the employer.

(i)(4) The employer shall provide training in the use and care of all hearing protectors provided to employees.

(i)(5) The employer shall ensure proper initial fitting and supervise the correct use of all hearing protectors.

(j) Hearing protector attenuation. (1) The employer shall evaluate hearing protector attenuation for the specific noise environments in which the protector will be used. The employer shall use one of the evaluation methods described in Appendix B: Methods for Estimating the Adequacy of Hearing Protection Attenuation.

(j)(2) Hearing protectors must attenuate employee exposure at least to an 8-hour time-weighted average of 90 decibels as required by paragraph (b) of this section.

(j)(3) For employees who have experienced a standard threshold shift, hearing protectors must attenuate employee exposure to an 8-hour time-weighted average of 85 decibels or below.

(j)(4) The adequacy of hearing protector attenuation shall be re-evaluated whenever employee noise exposures increase to the extent that the hearing protectors provided may no longer provide adequate attenuation. The employer shall provide more effective hearing protectors where necessary.

(k) Training program. (1) The employer shall institute a training program for all employees who are exposed to noise at or above an 8-hour time-weighted average of 85 decibels, and shall ensure employee participation in such program.

(k)(2) The training program shall be repeated annually for each employee included in the hearing conservation program. Information provided in the training program shall be updated to be consistent with changes in protective equipment and work processes.

(k)(3) The employer shall ensure that each employee is informed of the following:

(k)(3)(i) The effects of noise on hearing;

(k)(3)(ii) The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care; and

(k)(3)(iii) The purpose of audiometric testing, and an explanation of the test procedures.

(l) Access to information and training materials. (1) The employer shall make available to affected employees or their representatives copies of this standard and shall also post a copy in the workplace.

(l)(2) The employer shall provide to affected employees any informational materials pertaining to the standard that are supplied to the employer by the Assistant Secretary.

(l)(3) The employer shall provide, upon request, all materials related to the employer's training and education program pertaining to this standard to the Assistant Secretary and the Director.

(m) Recordkeeping—(1) Exposure measurements. The employer shall maintain an accurate record of all employee exposure measurements required by paragraph (d) of this section.

(m)(2) Audiometric tests. (i) The employer shall retain all employee audiometric test records obtained pursuant to paragraph (g) of this section:

(m)(2)(ii) This record shall include:

(m)(2)(ii)(A) Name and job classification of the employee;

(m)(2)(ii)(B) Date of the audiogram;

(m)(2)(ii)(C) The examiner's name;

(m)(2)(ii)(D) Date of the last acoustic or exhaustive calibration of the audiometer; and

(m)(2)(ii)(E) Employee's most recent noise exposure assessment.

(m)(2)(ii)(F) The employer shall maintain accurate records of the measurements of the background sound pressure levels in audiometric test rooms.

(m)(3) Record retention. The employer shall retain records required in this paragraph (m) for at least the following periods.

(m)(3)(i) Noise exposure measurement records shall be retained for two years.

(m)(3)(ii) Audiometric test records shall be retained for the duration of the affected employee's employment.

(m)(4) Access to records. All records required by this section shall be provided upon request to employees, former employees, representatives designated by the individual employee, and the Assistant Secretary. The provisions of 29 CFR 1910.20(a)-(e) and (g)-(i) apply to access to records under this section.

(m)(5) Transfer of records. If the employer ceases to do business, the employer shall transfer to the successor employer all records required to be maintained by this section, and the successor employer shall retain them for the remainder of the period prescribed in paragraph (m) (3) of this section.

(n) Appendices. (1) Appendices A, B, C, D, and E to this section are incorporated as part of this section and the contents of these Appendices are mandatory.

(n)(2) Appendices F and G to this section are informational and are not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

(o) Exemptions. Paragraphs (c) through (n) of this section shall not apply to employers engaged in oil and gas well drilling and servicing operations.

(p) Startup date. Baseline audiograms required by paragraph (g) of this section shall be completed by March 1, 1984. *[Source: 61 FR 9228, Mar. 7, 1996]*