

# **Occupational Noise Exposure and Hearing Conservation**

**MSC-RD-11812**

**Revision 3**

**Effective Date: March 27, 2013**

**Topic: Worker Protection**

Approved for Public Release;  
Further Dissemination Unlimited

## Occupational Noise Exposure and Hearing Conservation

### CHANGE SUMMARY

#### **Rev. 3**

#### **Description of Change:**

Add requirement regarding evaluating and documenting employee noise exposures and reporting to Case Manager (how/why/when), adding requirement for line managers/employees required reading.

# Occupational Noise Exposure and Hearing Conservation

## 1.0 PURPOSE AND SCOPE

This Level 2 Requirements Document (RD) conveys the requirements necessary to implement an occupational noise control and hearing conservation program (HCP) for all MSA employees and employees of MSA subcontractors as applicable in accordance with applicable Occupational Safety and Health Administration (OSHA) 29 CFR 1910, 29 CFR 1926, Department of Energy (DOE) 10 CFR 851 requirements, and MSC-MP-32219, MSA Worker Safety and Health Program Description.

This RD identifies a key aspect of the Mission Support Alliance (MSA) Worker Safety and Health Program (WS&H) and establishes the requirements to anticipate, identify, evaluate, and control noise hazards, to achieve regulatory compliance, and to prevent hearing loss caused by occupational noise exposure. For purposes of this RD the Occupational Medical Provider (OMP) is part of a coordinated health care team supporting the Hearing Conservation Program.

This RD includes the following major sections:

- General Requirements
- Hazard Identification
- Exposure Monitoring and Notification
- Hazard Control
- Medical Surveillance
- Training
- Records Management
- Records Identification
- References
- Appendices
  - A Glossary
  - B Default Controls
  - C Allowable Exposure Limits For Noise

**NOTE:** *Terms specific to this document are defined in [Appendix A](#).*

## 2.0 IMPLEMENTATION

This RD is effective upon publication

## 3.0 REQUIREMENTS

**NOTE:** *For the tables in this section under the requirement "type" column, "V" means verbatim and "I" means interpreted.*



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### 3.2 Employee Exposure Monitoring and Notification

#	REQUIREMENT	TYPE V or I	SOURCE
1.	<p>Line management shall ensure that noise exposures suspected or expected to be at or above the 8-hour TWA of 85 dBA (or equivalent noise dose) are quantified using sound level meters, noise dosimetry, and appropriate, acceptable measurement methodologies.</p> <p><b>NOTE:</b> <i>Historical data, industry/multiplier data, etc., may be used for identification purposes as long as such data can be shown to accurately represent the noise exposure circumstances being evaluated.</i></p>	I	10 CFR 851.23 (3)(7) and (9); 10 CFR 851.27 (6) and 10 CFR 851, Appendix A, item 6(a)
2.	<p>Where circumstances such as high worker mobility, significant variations in sound level, or a significant component of impulse noise make area monitoring generally inappropriate, line management shall ensure that representative personal sampling (noise dosimetry) is performed as the means to comply with the monitoring requirements specified in requirement 3.2.1, above, unless it can be demonstrated that area sampling produces equivalent results.</p> <p><b>NOTE:</b> <i>IHs are encouraged to utilize noise dosimetry as the preferred means to establish/document all 8-hour TWA exposures (in place of or in addition to noise survey data taken with sound level meters (SLMs)). Noise survey data with SLMs has a higher potential to result in either excessively liberal or excessively conservative TWA exposure projections.</i></p>	I	10 CFR 851.23 (3)& (7); 10 CFR 851, Appendix A, item 6(a)
3.	<p>Line management shall request assistance from the facility/project S&amp;H professional to conduct noise exposure assessments necessary to quantify the noise levels for all sources (portable and stationary) or work activities that could result in noise exposures at or above the 8-hour TWA of 85 dBA (or equivalent noise dose).</p>	I	10 CFR 851.23 (3)(7) and (9); 10 CFR 851.27 (6) and 10 CFR 851, Appendix A, item 6(a)
4.	<p>Sound level measurements shall integrate all continuous, intermittent and impulse sound levels from 80 to 130 decibels into the noise measurements</p>	V	29CFR 1910.95(d)(2)(i)

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5.	<p>Instruments used to measure employee exposure shall be calibrated to ensure measurement accuracy</p> <p><b>NOTE 1:</b> <i>Sound level and dosimetry instruments shall be calibrated annually in accordance with MSC-PRO-490.</i></p> <p><b>NOTE 2:</b> <i>Sound level and dosimetry instruments shall be field calibrated/performance verified prior to and following sampling in accordance with manufactures recommendations.</i></p>	V	29CFR 1910.95(d)(2)(ii)
6.	<p>Facility/project S&amp;H professionals shall conduct noise surveys and exposure monitoring in accordance with standard health and safety practices and manufacturer's recommendations to ensure that noise monitoring data is collected in a technically and legally defensible manner.</p> <p><b>NOTE:</b> <i>Noise surveys and/or exposure monitoring is recommended at a minimum of every 2 years, or more frequent if equipment, procedures, processes, or specific work activities change.</i></p>	I	10 CFR 851.23 (3)& (7); 10 CFR 851, Appendix A, item 6(a)  29 CFR 1910.95(d)(3)
7.	<p>Facility/project S&amp;H professionals shall compute noise exposures, determine TLV exceedance and follow all criteria and specifications contained in the "Noise" section of the most current edition of the "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices" booklet, as published by the ACGIH.</p>	I	10 CFR 851.23(9); 10 CFR 851.27(6)
8.	<p>Line management shall ensure that, affected employees and/or their representatives are allowed to observe any noise monitoring conducted pursuant to the provisions of this RD.</p>	I	10 CFR 851.23 (3)& (7); 29 CFR 1910.95(f)

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9.	<p>Line management shall ensure each employee who is exposed to noise at or above an 8-hour TWA of 85 dBA is notified of the monitoring results in a timely manner in writing, that meets the applicable requirements specified in <a href="#">MSC-PRO-409</a>, <i>Industrial Hygiene Monitoring, Reporting and Records Management</i> and that all of the following information is submitted to each affected employee:</p> <ul style="list-style-type: none"> <li>• Actual monitoring results;</li> <li>• Time and date of measurements;</li> <li>• Description of activities/daily tasks;</li> <li>• Requirements for including employees in the HCP;</li> <li>• Explanation of engineering controls or administrative controls used, if any, or planned to reduce noise levels or exposure to noise; and</li> <li>• Explanation of the types of hearing protectors available and the enforcement policy for wearing them when required by the HCP.</li> </ul>	I	<p>10 CFR 851.23 (3)(7) and (9); 10 CFR 851.27 (6); 29 CFR 1910.95(e)</p>
10.	<p>Facility/project S&amp;H professionals shall assist line management in reporting and explaining exposure monitoring results and other information to affected employees.</p>	I	<p>10 CFR 851.23 (3) &amp; (7)</p>

### 3.3 Hazard Control

#	REQUIREMENT	TYPE V or I	SOURCE
1.	<p>If the noise source/work activity will result in employee exposures to 85 dBA TWA (or equivalent noise dose), line management shall implement feasible engineering and administrative controls to reduce noise levels to below the 8-hour TWA of 85 dBA.</p> <p><b>NOTE:</b> <i>Engineering controls such as enclosure, vibration isolation, or exhaust muffling reduce noise levels. Administrative controls reduce the time that personnel work in hazardous noise areas.</i></p>	I	<p>10 CFR 851.23 (3)(7) and (9); 10 CFR 851.27 (6) and 10 CFR 851, Appendix A, item 6(b)</p>
2.	<p>MSA Safeguards and Security shall apply MIL-STD-1474-D-1997 or most recent version, Department of Defense Design Criteria Standard - Noise Limits, to noise exposures and hazard control from weapons systems that exceed ACGIH criteria.</p>	I	<p>ACGIH TLV &amp; BEI's - Acoustic</p>

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3.	Line management shall consult facility/project S&H professionals and facility engineering staff for recommendations and evaluations of engineering and administrative controls.	I	10 CFR 851, Appendix A, item 6(b)
4.	Line management shall ensure that, when/where engineering and administrative controls to reduce noise levels to below the 8-hour TWA of 85 dBA are deemed "not feasible"; the specific reasons for the "not feasible" determination are documented. The documentation shall be signed off by the cognizant facility manager and maintained in a manner and location enabling affected employees and/or compliance assessors to access the record.	I	10 CFR 851, Appendix A, item 6(b); 29 CFR 1910.95 (b)(1)
5.	Line management shall ensure that default controls specified in <a href="#">Appendix B</a> of this RD are utilized for the operations/activities specified in that Appendix.	I	10 CFR 851, Appendix A, item 6(a) and (b)
6.	Line management shall require and ensure the use of hearing protection in accordance with 29 CFR 1910.95(i)(2) to further reduce exposure when engineering and administrative controls are not adequate to control exposure to 85 dBA TWA.	I	10 CFR 851.23, (3)(7) and (9); 10 CFR 851.27 (6)
7.	Line management shall ensure that hearing protectors are selected and/or evaluated by the facility/project S&H professional to ensure that they will provide adequate noise attenuation	I	10 CFR 851.23 (3)& (7); 10 CFR 851, Appendix A, item 6(b)
8.	Hearing protection shall be evaluated by the facility/project S&H to assure that it attenuates employees noise exposure to an 8-hour TWA of 85 dBA	I	29 CFR 1910.95(j)(2)
9.	Hearing protection attenuation shall be reevaluated for effectiveness whenever employee noise exposures increase to the extent that the current hearing protection does not provide adequate attenuation. More protective hearing protection shall be provided as warranted.	I	29 CFR 1910.95(j)(4)
10.	Facility/project S&H professionals shall use 29 CFR 1910.95, Appendix B, to estimate the adequacy of hearing protection attenuation.	I	10 CFR 851.23 (3) and (7)
11.	Line management shall ensure that employees are provided with a selection of suitable hearing protectors, as approved by the facility/project S&H professional, so as to allow employees to select the most comfortable ones that will also provide the required protection.	I	10 CFR 851.23 (3) and (7); 10 CFR 851, Appendix A, item 6(b) 29 CFR 1910.95(i)(3)

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12.	Line management shall ensure that access to any and all areas/operations that have a measured or anticipated noise level above 130 dBA is strictly and effectively controlled so as to minimize the possibility of unanticipated, inadvertent or unreported noise exposures above 85 dBA TWA.	I	10 CFR 851 (7); 10 CFR 851, Appendix A, item 6(b)
13.	Line management shall, in consultation with the facility/project S&H professional, consider posting all noise hazard areas with appropriate hazard warning signs/labels as a hazard control and to prevent inadvertent employee overexposures. When used, signs/labels should conform to yellow-and-black color specifications for caution signs and should contain sufficient wording to identify the hazard and required protective action (e.g., "Hazardous Noise Area -- Wear Hearing Protection At All Times When In This Area," or "Noise Hazard -- Wear Hearing Protection When Operating.")  <b>NOTE:</b> <i>Signs are posted at the entrance or boundaries of areas/locations where noise levels equal or exceed 85 dBA TWA.</i>	I	10 CFR 851, Appendix A, item 6(b)
14.	Line management shall, in consultation with the facility/project S&H professional ensure that no employees are exposed to sound levels in excess of those proscribed in Appendix C without proper hearing protection and/or engineering and/or administrative controls in place. Hearing protection required at 85 dBA TWA in conformance with Section 3.3.6 above.	I	10 CFR 851.23(9)

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### 3.4 Medical Surveillance

#	REQUIREMENT	TYPE V or I	SOURCE
1.	<p>The employer/Line Management shall establish an audiometric testing program for employees whose exposure equals or exceed an 8-hour time weighted average (TWA) exposure of 85 decibels</p> <p>The site Occupational Medical Provider (OMP) has the responsibility to conduct the audiometric surveillance program for employees enrolled in the HCP, in accordance with 29 CFR 1910.95 (g)</p> <p>OMP functions:</p> <ul style="list-style-type: none"> <li>• Assist line management in scheduling employees with sound level exposures of 85 dBA TWA enrolled in the HCP for baseline, annual, repeat, and closeout audiograms through the medical scheduling system.</li> <li>• As requested, assist the Accident Investigator and facility/project S&amp;H professional in determining the work-relatedness of the hearing loss.</li> </ul>	I	10 CFR 851 29 CFR 1910.95
2.	<p>Line management shall submit a Employee Job Task Analysis (EJTA) and schedule a baseline audiogram for each employee who is identified as having noise exposure equal to or exceeding 85 dBA TWA (regardless of the use of any hearing protection).</p> <p><b>NOTE:</b> <i>Revising and submitting an employee's EJTA will trigger the scheduling of a baseline audiogram for the employee and will place the employee in the medical surveillance program for hearing conservation provided by the occupational medical provider (OMP), which includes required annual audiograms for the duration of HCP enrollment.</i></p>	I  I	10 CFR 851.23 (3), (7), (9); 10CFR 851.27 (6); 10 CFR 851, Appendix A, item 6(c) 29 CFR 1910.95(g)(5)

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3.	<p>Line management shall ensure that the EJTA is revised so that the baseline audiogram is obtained within 6 months of the employee's first exposure to noise at or above the allowable exposure of 85 dBA TWA. This applies to new employees and employees reassigned from jobs without hazardous noise exposure to jobs where their new exposure level equals or exceeds the TLV.</p> <p><b>NOTE:</b> <i>At least annually after obtaining the baseline audiogram, a new audiogram for each employee exposed at or above the 8-hour time-weighted average of 85 decibels shall be obtained.</i></p>	I	<p>10 CFR 851.23 (3), (7), (9); 10CFR 851.27 (6); 10 CFR 851, Appendix A, item 6(c); 29 CFR 1910.95 (g)(5)(i)</p>
4.	<p>Prior to or upon completion of an employee EJTA revision indicating noise exposure equal to or exceeding 85 dBA TWA line management shall ensure that the employee is enrolled in Hearing Conservation training, as detailed in <a href="#">Section 3.5</a>.</p>	I	<p>10 CFR 851.23 (3), (7), (9); 10CFR 851.27 (6); 10 CFR 851, Appendix A, item 6(c)</p>
5.	<p>Line management shall ensure that the employee is notified that their baseline audiogram is to be preceded by at least 14 hours without exposure to workplace noise at or above the exposure limit (85 dBA TWA). Employees shall also be advised to avoid exposure to high levels of non-occupational noise (or noise from other employment) for 14 hours before each audiogram.</p> <p><b>NOTE:</b> <i>Properly selected and correctly worn hearing protectors may be used to achieve this requirement.</i></p>	I	<p>10 CFR 851.23 (3), (7), (9); 10CFR 851.27 (6); 10 CFR 851, Appendix A, item 6(c), 29 CFR 1910.95 (g)(5)(iii)</p>
6.	<p>Facility/project S&amp;H professionals shall notify line management of employees who need to be enrolled in the HCP as well as those who no longer meet the exposure criteria for continued enrollment. Such notifications shall be based on noise survey, noise dosimetry data, or noise assessment results.</p>	I	<p>10 CFR 851.23 (3), (7), (9); 10CFR 851.27 (6); 10 CFR 851, Appendix A, item 6(b)</p>
7.	<p>When an employee in the HCP will no longer be exposed to noise at 85 dBA TWA or above, or leaves Mission Support Alliance (MSA) or MSA subcontractor employment, line management shall ensure that the employee's participation in the HCP is discontinued, by revising the employee's EJTA accordingly, and documenting the basis for discontinuance.</p>	I	<p>10 CFR 851.23 (3), (7), (9); 10CFR 851.27 (6); 10 CFR 851, Appendix A, item 6(c)</p>

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	<b>NOTE:</b> <i>Revising and submitting the EJTA to indicate that the employee will no longer be exposed to noise at 85 dBA TWA or above will trigger the OMP to schedule a close-out audiogram and discontinue the medical portion of the HCP, including the annual audiograms.</i>		
8.	When notified by the site OMP that, as a result of the annual audiogram, a standard threshold shift (STS) has occurred, line management shall ensure that a repeat audiogram is scheduled within 30 days of the original to determine if the STS is persistent.	I	10 CFR 851.23 (3) and (7); 10 CFR 851, Appendix A, item 6(c) 29 CFR 1910.95(g)(7)(ii)
9.	Line management shall notify facility/project S&H professionals that an employee STS has occurred so that the employee's exposure, use and adequacy of controls and hearing protection is re-evaluated.	I	10 CFR 851.23 (3) and (7); 10 CFR 851, Appendix A, item 6(b)
10.	Project S/H shall evaluate and document employee noise exposures and provide a summary report to Case Manager within 14 working days upon receipt of STS notification. Summary report data to be captured on Standard Threshold Shift (STS) Form A-6006-313.	I	29 CFR 1910.95(g)(7)(iii)(A)
11.	When a repeat audiogram shows that the STS is persistent, line management shall ensure that the employee is trained (or re-trained) in the proper use and care of hearing protectors and shall require the employee to wear hearing protectors until engineering or administrative controls are implemented so that they reduce the noise exposure to 85 dBA TWA or less.	I	10 CFR 851.23 (3), (7), (9); 10CFR 851.27 (6)
12.	If the repeat audiogram shows that the STS is persistent, line management shall ensure that the affected employee is notified in writing within 21 working days of the repeat audiogram.	I	10 CFR 851.23 (3), and (7); 10 CFR 851, Appendix A, item 6(c) 29 CFR 1910.95(g)(9)(i)
13.	Line management shall refer employees to the OMP for evaluation if problems due to wearing hearing protectors (such as headaches, ear pain, irritation, or inability to hear signals) are reported or suspected.	I	10 CFR 851.23 (3) and (7); 10 CFR 851, Appendix A, item 6(c)
14.	Facility/project S&H professionals shall assist line management in interpreting the IH aspects of medical opinions and recommendations, and interface with the OMP.	I	10 CFR 851, Appendix A, items 6(b) and 6(c)

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### 3.5 Employee Training

1.	Line managers that have employees enrolled in the Hearing Conservation Program or have employees identified in their EJTA as having noise exposure shall be assigned MSC-RD-11812 as Required Reading.	I	29 CFR 1910.95(k)
2.	<p>Line management shall ensure that each newly enrolled employee in the HCP is provided initial training on the following general HCP topics:</p> <ul style="list-style-type: none"> <li>• Effects of noise on hearing.</li> <li>• Purpose of hearing protection.</li> <li>• Advantages and disadvantages of various types of protection.</li> <li>• Instructions on selection, fit, use and care of protective devices.</li> <li>• Purpose of audiometric testing and an explanation of the test procedure.</li> <li>• Rights of workers to access records and federal hearing information releases.</li> <li>• Where to obtain copies of this RD and 29 CFR 1910.95 (or 29 CFR 1926.52, as appropriate).</li> </ul> <p><b>NOTE:</b> <i>Course # 020194, or equivalent, can be used to fulfill these training requirements.</i></p>	I	<p>10 CFR 851.23 (3) and (7)</p> <p>29 CFR 1910.95 (k)</p>
3.	<p>Line management shall ensure that facility/project - specific training is provided, as necessary, to address, as a minimum, the following additional information: Facilities areas, processes and/ or equipment where the employee may be required to work that have been found to have noise levels resulting in exposures above a TWA of 85 dBA.</p> <p>Project/facility-specific requirements or practices regarding noise exposure and/or controls (posting/signing, personnel protective equipment (PPE), etc.)</p> <p><b>NOTE:</b> <i>Facility Emergency Hazard and Information Checklist (FEHIC) training may be used to accomplish the training requirements specified above.</i></p>	I	<p>10 CFR 851.23 (3), (7) and (9); 10 CFR 851.27(6)</p>
4.	<p>Upon continued exposure to 85 dBA TWA or greater, provide annual refresher training on the subjects above.</p> <p><b>NOTE:</b> <i>Course # 020194, or equivalent, when supplemented by facility-specific training on the topics</i></p>	I	<p>10 CFR 851.23 (3), (7) and (9); 10 CFR 851.27(6)</p> <p>29 CFR 1910.95(k)(2)</p>



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## 5.0 RECORDS IDENTIFICATION

All records are generated, received, processed, and maintained by MSC in accordance with [MSC-PRO-10588](#), *Records Management Processes*.

**Records Capture Table**

Name of Document	Submittal Responsibility	Retention Responsibility
Industrial Hygiene Baseline Hazards Assessments (ref: <a href="#">Section 3.1.4</a> )	Project/facility S&H	Project/facility S&H
Noise surveys and noise exposure monitoring records. MSC-PRO-409	Project/facility S&H	Project/facility S&H
Employee notifications of noise monitoring results (ref: <a href="#">Section 3.2.9</a> )	Project/facility S&H	Project/facility line management

## 5.0 REFERENCES

### 5.1 Source References

10 CFR 851, *Worker Safety and Health Program*

MSC-MP-32219, *10 CFR 851 MSC Worker Safety and Health Program Description*  
 MSC-PRO-17916, *Industrial Hygiene Baseline Hazard Assessments*  
 MSC-PRO-079, *Job Hazard Analyses*

29 CFR 1910, Occupational Safety and Health Standards, General Industry  
 29 CFR 1926, Occupational Safety and Health Standards, Construction Industry

STD-1474D-1997, Department of Defense Design Criteria Standard - Noise Limits"

### 5.2 Working References

*Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, American Conference of Governmental Industrial Hygienists, most current edition.

29 CFR 1910.1020, *Access to Employee Exposure and Medical Records*  
 29 CFR 1910.95(m)(4), *Recordkeeping*

[MSC-PRO-409](#), *Industrial Hygiene Monitoring, Reporting and Records Management*  
[MSC-PRO-10588](#), *Records Management Processes*

NIOSH 98-126, *Criteria for a Recommended Standard - Occupational Noise Exposure (Incorporated by reference to OSHA 29 CFR 1910.95)*

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## APPENDIX A Glossary

Term	Definition
<b>audiogram</b>	A chart, graph, or table presenting the results from an audiometric test, showing an individual's hearing threshold levels as a function of frequency.
<b>baseline audiogram</b>	An audiogram against which future audiograms are compared.
<b>decibel (dB)</b>	Unit for expressing the relative sound pressure level on a logarithmic scale from zero for the average least perceptible sound to about 130 for the average pain level.
<b>A-weighted sound pressure level (dBA)</b>	Sound pressure level measured on the "A" frequency weighting scale of a standard sound level meter. This scale approximates the response of the human ear to noise at lower levels, by selectively responding to higher sound frequencies (which are more damaging than lower frequencies).
<b>dose</b>	The measure of exposure to noise energy with reference to the stated TLV. For example: a 100 percent TLV dose is equivalent to 85 dBA as an 8-hour TWA; a worker exposed to 85 dBA for 4 hours has received 50 percent of the allowable dose, and a worker exposed to 88 dBA for 4 hours has received 100 percent of the allowable dose.
<b>exchange rate</b>	The rate at which an increase in noise level is "exchanged" for decreased exposure time, or conversely, a decrease in noise level is exchanged for a longer exposure time. A 3 dB exchange rate results in cutting the allowable exposure time in half when the noise energy doubles (i.e., increases by 3 dB).
<b>exposure assessments</b>	Determinations of potential and actual exposure to noise, including initial and subsequent qualitative and quantitative exposure assessment activities.
<b>impulse or impact noise</b>	Noise characterized by a sharp rise and rapid decay in sound levels and is less than 1 second in duration.
<b>noise reduction rating (NRR)</b>	The amount of attenuation in decibels provided by hearing protectors with individual pure tones in a test chamber without echoes or reflections. This number must be adjusted downward in consideration of actual noise exposure situations.
<b>noise (hazardous noise)</b>	Noise levels equal to or exceeding 85 dBA TWA or an equivalent noise dose.

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<b>OSHA recordable threshold shift</b>	Generally, a threshold shift of 25 dB avg. at 2000, 3000, and 4000 Hz or greater when compared with the original (earliest) baseline audiogram, allowing for presbycusis.
<b>Standard Threshold Shift (STS)</b>	Change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz or greater in either ear, and accounting for presbycusis.
<b>Threshold Limit Value (TLV)</b>	The sound level in dBA to which workers may be exposed for a specified duration which will protect most workers against hearing loss over a working lifetime.
<b>Time-Weighted Average (TWA)</b>	The average sound pressure level incorporating varying exposure levels weighted by their duration during the work shift.

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### APPENDIX B

#### Default controls/actions to prevent unprotected noise exposures above 85 dBA, 8-hour TWA

Included in this Appendix are work activities for which MSA S&H has determined, to date, that sufficient MSA exposure monitoring data is available so as to allow establishment of default actions and controls applicable to all anticipated instances of those work activities.

These work activities shall be accepted as having sufficient potential to result in 8-hour TWA exposures above 85 dBA so as to make additional exposure monitoring unnecessary unless the cognizant IH has reason to believe that new, previously-unmonitored exposure scenarios for the work activity are taking place.

**NOTE:** *Noise surveys and exposure monitoring is recommended at a minimum of every 2 years, or more frequent if equipment, procedures, processes or specific work activities change.*

This Appendix will be expanded to include additional work activities as sufficient additional exposure monitoring data for those activities become part of MSA's Industrial Hygiene employee exposure database.

Inclusion in this Appendix also serves as the documentation required by [Section 3.3.4](#) of this RD that engineering and/or administrative controls to reduce employee exposures to below the 8-hour TWA of 85 dBA are "not feasible". Therefore, inclusion of a work activity in this Appendix means that no separate/further documentation to meet this requirement is necessary.

#### **Mandatory default actions/controls:**

- Hearing protection required for workers performing activity and other workers within 25' of activity (ref: Section 3.3.5 of this RD); and
- EJTA review required to ensure that Question 9 on "PEH, Part 1" page is answered either "2" or "3", as appropriate (ref: [Section 3.4.1](#) of this RD); and
- Training required (ref: [Section 3.5](#) of this RD)

**NOTE:** *for impact/impulse noise Hanford Patrol shall refer to current MIL-STD-1474 for hearing protection requirements.*

#### **Work activities to which the mandatory default actions/controls apply:**

1. well drilling operations; and
2. pneumatic tool operation; and
3. power equipment operation (drills, saws, grinders, etc.); and
4. "Guzzler " truck operation; and
5. heavy equipment operations (excavators, loaders, graders, etc.)
6. Concrete coring, cutting; and
7. Chain sawing; and

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8. Work around generators, compressors, emergency generators, pumps; and
9. Equipment, process or continuous operations that exceed 105 dBA shall require the use of double hearing protection (ear plugs and ear muffs or other combination) unless controls (e.g., posting, time limits or other administrative controls) are documented in a specific hazard analyses.

If a project/facility has noise exposure monitoring data indicating that noise exposures for work activities listed above are below an 8-hr TWA of 85 dBA and desires an exemption to the mandatory default controls required by this Appendix for those work activities, they shall submit to the MSA noise control/hearing conservation Interpretive Authority (IA) (or Functional Area Manager (FAM), if IA is not available), data and information verifying that exposures will be below 85 dBA, 8-hour TWA. The data/information to be submitted shall include, as a minimum:

- description of operation, which includes environmental and exposure factors likely to influence noise exposures; and
- equipment being used; and
- specific controls being utilized; and
- summary of exposure monitoring data.

Upon completion of data review, the MSA S&H IA (or FAM) will notify the requestor via e-mail whether an exemption will be granted.

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## Appendix C

### Allowable Exposure Limits for Noise ACGIH TLV

Table 1. Exposure Limits for Noise<sup>a</sup>

Hours Per Day	Sound Level dBA	Minutes Per Day	Sound Level dBA	Seconds Per Day <sup>b</sup>	Sound Level dBA
24	80	30	97	28.12	115
16	82	15	100	14.06	118
8	85	7.50 <sup>b</sup>	103	7.03	121
4	88	3.75 <sup>b</sup>	106	3.52	124
2	91	1.88 <sup>b</sup>	109	1.76	127
1	94	0.94 <sup>b</sup>	112	0.88	130
--	--	--	--	0.44	133
--	--	--	--	0.22	136
--	--	--	--	0.11	139

<sup>a</sup> No exposure to continuous, intermittent, impulse, or impact noise in excess of a peak C-weighted level of 140 dB.

<sup>b</sup> Limited by duration of the noise source, not by administrative control. (Administrative control is not effective for these exposures because of the difficulty in limiting short stay times.)

Combining periods of exposure at different sound levels:

If the daily noise exposure is composed of 2 or more periods of noise exposure of different sound pressure levels, combine the periods in the following equation:

$$\left( \frac{C^1}{T^1} + \frac{C^2}{T^2} + \frac{C^3}{T^3} + \dots + \frac{C^n}{T^n} \right) \times 100 = \text{percent of allowable dose}$$

Where:

- C** = total duration (hours, minutes, or seconds) of exposure at a specific sound pressure level
- T** = allowable exposure duration (hours, minutes, or seconds) from Table 1.

If the sum of these fractions is greater than 1 (such as unity), the combined exposure exceeds the exposure dose limit of 85 dBA TWA. Multiplying the sum of fractions by 100 will convert the answer to percent of the allowable dose.