

November

| 2023

Noise Dosimetry Report

XYZ Manufacturing Company, Inc.

Address (if multiple locations in same city) City, State

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INTRODUCTION

SURVEY LOCATION:	XYZ Manufacturing Company, Inc. 2020 W. Paradise Dr. West Bend, WI 53095
SURVEY DATE:	November 11, 2016
CONDUCTED BY:	Dudley Doright, Loss Control Consultant
CONTACTS:	Mr. John Smith, Human Resources Manager Mr. Martin Short, Press Department Supervisor
PURPOSE:	State specific reason you're doing the monitoring (e.g., request, change in machinery, change in operations, etc.) being brief and to the point. (e.g., Testing was conducted at the request of Mr. John Smith for the purpose of documenting current employee exposure level prior to equipment and plant modifications.)

EXECUTIVE SUMMARY

Summarize the results of the study.

- Give a summary of the results. For example, how many exceeded and were under the Occupational Safety and Health Administrations "Occupational Noise Exposure" Permissible Exposure Limit (OSHA PEL) of 90 dBA and 85 dBA action level.
- When samples are over action level or PEL, there should be some indication of to whom or where they were over.
- Comment if current hearing protection is adequate/inadequate for the recorded exposure if properly worn.
- Indicate what needs to occur if employees are over action level or PEL (indicate if account has HC program and employees need to remain in or be included in it; if account doesn't have program and one needs to be developed).

SAMPLING METHOD

Quest Electronics Model (insert dosimeter model (e.g., Q-200, NoisePro, etc.) dosimeter units were used to complete the noise sampling. A noise dosimeter is a specialized device that integrates an employee's noise exposure over the sampling period. To ensure the accuracy of the results, the dosimeters were calibrated prior to and following the evaluation.

The samples were obtained by fastening the dosimeters onto employees with the microphones on the highest point of the shoulder and close to the ear of those being monitored. This is the most accurate way to determine the noise levels an individual is exposed to while moving through the work environment. Employees were informed of the function and purpose of the noise/dosimeter monitoring and was provided information about avoiding affecting the results by removing the microphone, altering placement of the microphone with the use of additional clothing, or moving the microphone from its pre-set position. Employees were instructed to seek assistance if needed to add or remove clothing and to not attempt to do it themselves. Employees were also instructed to seek assistance if the equipment interfered with their normal duties, or the microphone was altered from its pre-set position. Employees were asked to complete job tasks in a normal fashion.

NARRATIVE DESCRIPTION

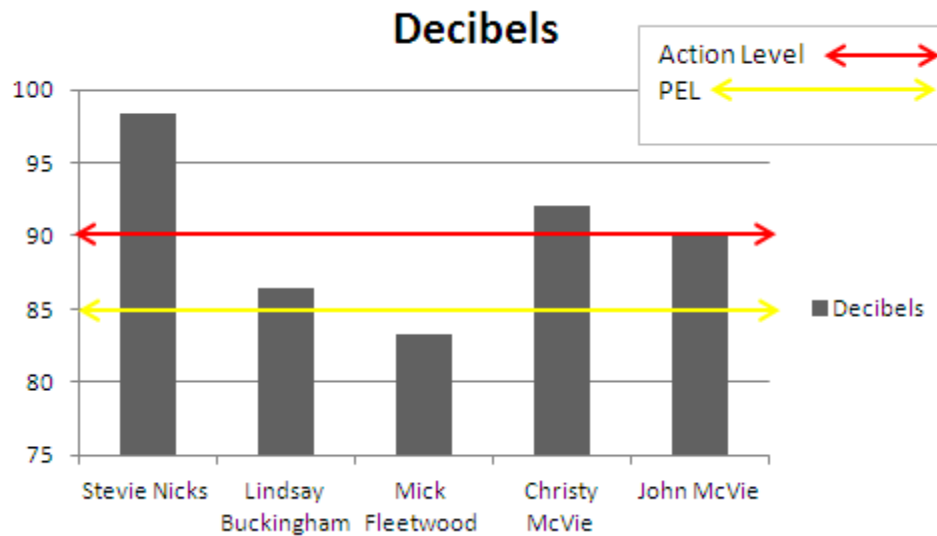
This section should describe the area where each employee was working, what the employees were doing, what typical jobs are, cycle times, machines running, and any obvious conditions which could affect the employees' noise exposure (e.g., radio blaring, headset use, air compressor near a normally quiet area, etc.). Give the reader a clear picture of what the conditions were the day the monitoring was completed. Also include information on whether PPE is required, and if so, what.

- Get the employees' full names.
- Provide significant detail on the employees' work activities.
- Take photos of each employee sampled to document as much as possible for future reference.
- Document type of hearing protector worn, if any, NRR and calculate protected TWA using appendix.
- Indicate length of shift (e.g., eight hours, 10 hours, etc.), typical length of lunch and breaks, and shift start and end times. If the meter was worn during lunch, where did the employee go?
- Indicate if results of sampling were representative of a typical working day. Detail how this was determined (e.g., employee indicates it was a normal day, employee produced approximately same number of widgets as average, etc.).
- Document primary sources of noise.

RESULTS

Summarize employees tested and results and document if any were out of the ordinary. Include chart for easy reference. {Non-Mandatory – Chart is appropriate if measured levels are significant enough to illustrate see below.} Indicate what each employee's eight-hour TWA was as sampled. A table would be better than a narrative description of the results.

If shift length is more than eight hours, provide an adjusted action level.



Per the requirements of 1910.95(e), should any employee be exposed above the action level, the employee shall be notified of the results of the monitoring.

In addition, 1910.95(m)(3) requires that these results be maintained for at least two years. However, it's encouraged that these results be retained for longer should documentation be necessary to validate or defend claims of hearing loss.

RECOMMENDATIONS

If over the PEL, the following recommendation(s) is(are) required. Should be customized to the specifics of the noise sources/environment.

XX-XX engineering controls should be implemented to bring the noise levels below the OSHA permissible exposure limit of 90 dBA for an eight-hour TWA.

Include additional recommendations as needed to develop hearing conservation program, include personnel in hearing conservation program, improve hearing conservation program, obtain alternative hearing protectors, etc.

Suggest that they share the results or post results for employees to see.

OSHA EXPOSURE CRITERIA

OSHA has established two levels of compliance when evaluating noise.

The one that most people are familiar with is the action level (85 dBA). The action level is when a worker is exposed to noise levels at or above 85 dBA or greater for an eight-hour time weighted average (TWA) or half of the permissible exposure limit (PEL). When a worker is at or above this level, even if only one day per year, a hearing conservation program is required.

Employees can, and do, often work extended or overtime hours. Overtime requires the action levels to be adjusted based upon the number of hours they are working. The formula to determine the new action limit is:

$$\text{Adjusted Action Limit} = 90 + 16.61 \times \log [50 / (12.5 \times \# \text{ hours worked})]$$

This chart shows adjusted action limits for typical overtime hours worked. ¹

Hours Worked	New Action Limit
9	84.1
10	83.4
11	82.7
12	82.1

The second level is the PEL of 90 dBA for an eight-hour TWA. At this level not only is a hearing conservation program required, but hearing protectors are also mandatory, and the employer is required to try and implement engineering controls to reduce the overall noise levels.

HEARING CONSERVATION

This section isn't needed if testing indicates employees TWA is less than 85 dBA. If you choose to delete this section, delete the heading, and update the Table of Contents. Otherwise indicate "Based upon the sampling results in this report, a hearing conservation program doesn't appear to be required at this time."

If one or more of the employees sampled had a noise exposure greater than 85 dBA this section is necessary. You should document the employer's need to have a hearing conservation program, indicate if they have a program, and if they have a program, you must evaluate the program against OSHA's requirements. Hearing conservation programs consist of:

- Baseline and annual audiometric testing
- Annual employee training

¹ Based on the noise exposure limit for overtime or extended work shift using a 5 dB exchange rate.

- Copies of 1910.95 being available to employees
- On-going noise monitoring whenever changes in production/operations would dictate
- Provision of hearing protectors with a suitable NRR
- Recordkeeping of noise monitoring and audiometric results
- Employees being given access to records

EXPOSURE REDUCTION

If exposures are below action level, use this verbiage and delete the text highlighted yellow:

Based upon the sampling results, no additional control measures are necessary at this time to further reduce employee exposure to noise.

If exposures are over the action level, delete the text highlighted green and use this text, customized to the exposures in the workplace:

When noise control is necessary there are many options available; however, the most effective is to start with engineering controls, followed by administrative controls, and then personal protective equipment.

Customize the sections below to fit the unique exposures in the workplace.

Engineering controls involve modifying or replacing equipment or making related physical changes at the noise source or along the transmission path to reduce the noise level at the worker's ear. Examples of inexpensive, effective engineering controls include:

- Installing mufflers on engines.
- Using silencers wherever gases are being released, particularly on the exhausts from compressed air actuated equipment.
- Ensuring equipment is in good operating condition—no squeaking or rattling parts, etc.
- Performing regular preventative maintenance.
- Ensuring equipment is operating as designed—compressed air pressures are set at manufactures recommended levels, motion is within design limits and not hitting stops or other objects, impact pressure is set correctly.
- Using the correct equipment for the work—inefficient equipment may generate more noise and will usually generate noise for a longer time.
- Damping noise producing machine panels and materials. Some panels and materials will work like drums or bells to produce noise when they are shaken, vibrated, or struck. Damping means holding the materials tightly to prevent them from continuing to vibrate or adding materials that absorb the vibration energy.
- Contact equipment manufacturer, supplier or distributors for equipment retrofits or upgrades.
- Move workstations further from noise sources.
- Place panels or barriers between the worker and the noise source.
- Enclose or isolate noise-producing equipment.

Administrative controls are changes in the workplace or schedule that reduce or eliminate the worker exposure to noise. Examples include operating noisy machines during shifts when fewer people are exposed, limiting the amount of time a person spends at a noise source, providing quiet areas where workers can gain relief from hazardous noise sources, and controlling noise exposure through distance (for every doubling of the distance between the source of noise and the worker, the noise is decreased by six dBA).

DISCLAIMER

The results in this report describe the noise levels and the information supplied on the date of the survey. On a day-to-day basis many factors can affect the results. Environmental factors include radio use, lift truck traffic, open windows/doors, warning bells, alarms, sirens. PA announcements, etc. Other factors, such as production increases, downtime, machinery/equipment, and product being produced also play a role in the employee's exposure.

Safety and health are the responsibilities of your company. Please understand that the information and services provided don't guarantee that your premises and/or operation are completely free of all hazards or in compliance with OSHA or any other municipal, state, or federal ordinances or regulations. The information and services received aren't a substitute for ongoing safety/loss control programs designed and implemented by your company.

APPENDIX - Calculating Hearing Protector Effectiveness

Reducing employee exposure to noise is most effectively accomplished through engineering controls. Engineering controls should be implemented as the preferred means to reduce the worker's noise exposure below 90 dBA for an eight-hour time-weighted average (eight-hour TWA). Although in certain situations the Occupational Safety and Health Administration (OSHA) does permit controlling noise through administrative controls and/or in combination with a hearing conservation program, these methods are not as effective as well designed and maintained engineering controls.

When earplugs or earmuffs are used as a means of protection, you need to know if the protection reduces the employee's exposures below current requirements. While hearing protectors are assigned a noise reduction rating (NRR) rating by the Environmental Protection Agency (EPA), the NRR simply can't be subtracted from the level of noise to which an employee is exposed. In addition, the NRR value is determined in a laboratory, and it has been found that in the real world, employees do not generally receive as much noise protection.

To estimate the attenuation provided by hearing protectors and an employee's estimated amount of noise exposure (protected TWA), the following calculations can be used. Note: while OSHA does not require the 50% safety factor to be used for all regulatory purposes in the Occupational Noise Standard (1910.95), Argent feels OSHA's NRR adjustment process detailed below is the best method for determining if the hearing protectors employers are providing to their employees provide adequate protection from the damaging effects of noise.

For muffs or plugs:

- Determine the NRR. This number is typically visible and should be on the hearing protection packaging.
- Subtract seven dB from the NRR to correct for using A-weighted measurements.
- OSHA compliance offices then take half (50%) of the corrected NRR from the noise exposure.

Example one

Measured Employee Exposure = 100 dBA 8-hour TWA

Muff NRR = 20 dB

Solution: Attenuation is $(20 - 7)/2 = 6.5$ dB

Protected TWA: 100 dBA TWA - 6.5 dB = 93.5 dBA

Conclusion: The protected TWA can be assumed to be 93.5 dBA. This hearing protection isn't adequate and engineering controls should be utilized. If engineering controls are not feasible

better hearing protection must be used. If the employee shows STS, administrative controls or medical removal should be employed.²

Example two

Measured Employee Exposure = 98 dBA 8-hour TWA

Plug NRR = 29 dB

Solution: Attenuation is $(29 - 7)/2 = 11$ dB

Protected TWA: 98 dBA TWA - 11 dB = 87 dBA

Conclusion: The protected TWA can be assumed to be 87 dBA. This hearing protector is adequate if the employee does not exhibit STS or where there is less than six months from the employee's first exposure and their baseline audiogram using the mobile test van exception (1910.95(g) (5) (ii)). Engineering controls should be utilized to further reduce the noise level below 85 dBA.

For dual protection (e.g., employee wears both muffs and plugs):

- Determine the laboratory-based noise attenuation (NRR) for the higher rated hearing protector, subtract 7dB, divide by 2 (50%).
- Then add 5 dB to the field-adjusted NRR to account for the use of the second hearing protector.

Example

Measured Employee Exposure = 110 dBA TWA

Plug NRR = 29 dB Muff NRR = 25 dB Employer requires dual protection.

Solution: (a) Calculate adjusted NRR for the better protector. $(29 - 7)/2 = 11$ dB

(b) For dual protection add 5 dB to this field-adjusted NRR. $11 + 5 = 16$ dB

Protected TWA: 110 dBA TWA - 16 dB = 94 dBA

Conclusion: The protected eight-hour TWA is 94 dBA. This hearing protection is not adequate and engineering controls should be utilized. If engineering controls are not feasible better hearing protection must be used. If the employee shows STS, administrative controls or medical removal should be employed.

2 CPL 2-2.35A, May 8, 1984, MEMORANDUM FOR: REGIONAL ADMINISTRATORS, FROM: JOHN B. MILES, JR., Director, Directorate of Field Operations, SUBJECT: Region III's Supplement to Noise Policy Question 10. OSHA Technical Manual for compliance officers.