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1.0 INTRODUCTION

1.1 Purpose

The purpose of this program is to outline the methods for identifying and managing the hazards associated with noise and effective methods for mitigating and monitoring noise exposure. It is the objective of Marathon to reduce employee workplace noise exposure to the extent that no Marathon employee will sustain a permanent hearing loss as the result of work environment.

1.2 Scope

This procedure applies to Marathon Anacortes Refinery employees and contractors. All personnel working on Marathon Anacortes Refinery property must comply with this procedure.

2.0 REFERENCES

2.1 Marathon Standards, Policies & Procedures

- HLT-2034, Hearing Conservation Program
- HLT-2001, Industrial Hygiene Program
- HLT-2025, Employee Health Monitoring Examination Protocols Standard
- TES-410, Noise Limits for Equipment and Piping

2.2 Government Regulations

- OSHA 29 CFR 1910.95, Occupational Noise Exposure
- WAC 296-817, Hearing Loss Prevention (Noise)

2.3 Other

- ACGIH 2015 TLVs and BEIs Book

3.0 DEFINITIONS

The following definitions are applicable to this procedure.

Table 1 Definitions

Term	Description
Action Level (AL) for Noise	A time-weighted average measured on the A-scale, slow response. For 8-hour work shifts the AL is 85 dBA, for 10-hour work shifts, the AL is 83dBA, for 12-hour work shifts, the AL is 82 dBA or equivalently, a dose of fifty percent of the OSHA PEL.
Audiogram	A chart, graph or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

Table 1 Definitions

Term	Description
Audiologist	A professional, specializing in the study and rehabilitation of hearing, who is certified by the American Speech, Hearing, and Language Association, or the American Academy of Audiology, and is licensed by the state board of examiners.
Baseline Audiogram	The audiogram against which future audiograms are compared. A baseline audiogram must be obtained within 6 months of an employee's first assignment to job duties that result in noise exposure at or above the action level.
Decibels (dB)	Commonly used as a measurement of acoustic intensity and sound pressure levels.
Decibels, A-Weighted (dBA)	Sound level meters and noise dosimeters are typically set to A-weighting with slow response to measure occupational noise exposure. A weighting is designed to mimic the sensitivity of the human ear to noise levels less than 100 decibels and is used for regulatory compliance determinations.
Dual (or Double) Hearing Protection	Concurrent use of both plug type and muff type hearing protectors.
Exchange Rate	Amount by which the permitted sound level may increase if the exposure time is halved. The OSHA exchange rate is 5 dBA, the ACGIH and NIOSH exchange rate is 3 dBA
Fast Response	A setting for a sound level meter that will allow the meter to respond to noise events of less than one second. Used for evaluating impulse and impact noise levels.
Slow Response	A setting for a sound level meter mandated by OSHA to be used for measuring noise exposure against a time weighted average permissible exposure limit.
Hearing Protector Device (HPD)	Devices, such as ear plugs or ear muffs, designed to protect against harmful effects on hearing from over-exposure to noise.
Hertz (Hz)	Unit of measurement of frequency, numerically equal to cycles per second
High Noise Area	Defined as an area where ambient noise levels can routinely exceed 85dBA
Noise Area Survey	A noise area survey takes noise measurements throughout a site to identify high noise areas. The data is plotted on a sketch of the work area. Noise area surveys are also known as noise maps.
Noise Dose	The total noise exposure received by an employee during the work shift. Noise dose can be expressed as a percentage of the noise exposure that would occur from 8 hours of exposure to 90dBA (OSHA PEL) or 85dBA (TEOL). Noise dose may also be expressed as the average sound level in dBA experienced by the employee during the entire work shift.
Occupational Hearing Loss	A reduction in hearing ability that was caused by or contributed to by exposure to high noise in the work environment
Otolaryngologist	A physician specializing in diagnosis and treatment of disorders of the ear, nose and throat.
Permanent Threshold Shift	A hearing level reduction that has become persistent and is not expected to improve.

Table 1 Definitions

Term	Description
Permissible Exposure Limit (PEL) for Noise	OSHA 29 CFR 1910.95 provides a time-weighted average permissible exposure limit of 90 dBA over 8 hours, 88 dBA over 10 hours and 87 dBA over 12 hours.
Sound Level Meter	An instrument that measures sound level or intensity of ambient noise.
STS (Standard Threshold Shift)	An average 10dB loss from baseline 2000, 3000 and 4000 Hz in either ear as measured by an audiogram and sustained after repeated audiograms.
Temporary Threshold Shift (TTS)	A reduction in hearing ability that improves with time away from noise. TTS can become permanent if over-exposure to loud noise is repeated frequently.
Occupational Exposure Limit (OEL)	The allowed occupational exposure for Marathon employees based on Marathon's use of industry best practice and/or Marathon's risk tolerance. The OEL for noise is a 8-hour TWA of 85dBA based on a 3 dBA exchange rate.

4.0 ROLES AND RESPONSIBILITIES

4.1 Industrial Hygienist

The Industrial Hygienist is the owner of the hearing conservation program (HCP) responsible for ensuring noise monitoring data is current and available for employees. This standard shall be reviewed by the owner on a periodic basis, period not to exceed three years, to ensure that all requirements of HLT-2034 are covered. It should also be checked against applicable state, county and municipal agency requirements during review to ensure that any legal requirements more stringent than Marathon's corporate standard are met.

4.2 Health Services Department

The Health Service Department is responsible for administrating, and communicating the results of audiometric evaluations. Requirements and protocols for Medical surveillance are set forth in the HLT-2025 Employee Health Monitoring Examination Protocols Standard and in 29 CFR 1910.95.

4.3 Engineering and Planning

Engineering and Planning personnel are responsible for designing or installing new equipment and must be familiar with the requirements set forth in TES-410 Noise Limits for Equipment and Piping. New equipment should be purchased that will not emit continuous noise levels above 85dBA measured three feet from surface. If quieter equipment has been investigated and is not feasible, then part of the equipment installation project will include engineering controls to reduce noise to 85dBA or less. Existing equipment should be maintained so that equipment will not be unnecessarily loud.

Engineering Controls include, but are not limited to, sound proofing material or enclosing or isolating noise sources. Site Engineers will be responsible to either design the controls or review designs submitted by manufacturers or contractors installing equipment.

4.4 Supervisors

Supervisors are responsible for providing adequate PPE and ensuring that employees wear hearing protection in high noise areas where it is required, in accordance with WAC 296-817-20015.

4.5 Employees

Employees are responsible for scheduling appointments and staying aware of this procedure, compliance with use of hearing protection, and completion of program training requirements.

5.0 HEALTH EFFECTS OF NOISE

Hearing loss in adults has many causes including, but not limited to, disease, infection, drugs, unprotected exposure to loud noise, tumors, trauma, and the aging process. Tinnitus or ringing in the ears may occur as a symptom of hearing loss or may occur by itself without any hearing loss.

5.1 Acute Effects (i.e., Short Term)

Unprotected exposure to loud noise, if only occasional, can at first cause temporary hearing loss. If unprotected exposures continue day after day (i.e., chronic), temporary shifts or reduction in hearing ability can become permanent.

5.2 Chronic (i.e., Long Term)

Permanent hearing loss due to noise exposure above 90 dBA results from nerve cell damage in the inner ear and cannot be medically repaired or treated.

6.0 NOISE EXPOSURE CONTROLS

When feasible and cost effective, engineering controls are required to reduce employee full-shift noise exposures to below the applicable action levels. When noise levels cannot be mitigated through engineering controls or administrative control measures, then hearing protection devices must be used.

Administrative Controls include limiting the amount of time a person may spend near a noise source or restricting worker presence to a suitable distance away from noisy equipment or placing signs to identify high noise areas.

6.1 High Noise Areas

Areas with noise levels that consistently exceed 85dBA are designated as high noise areas. High noise areas require persons entering those areas to use hearing protection.

Hearing protection devices are available to all employees and contractors. At the Marathon Anacortes Refinery, all process areas/units are considered high noise areas and require hearing protection to be worn. Other areas within the refinery that are outside of process units (i.e., Flare Gas Recovery Unit) use signs to identify high noise areas. Signs shall be permanently affixed around the perimeter of areas designated as high noise areas, including all process units where high noise areas are assumed. The signs may be specific to the location with regards to composition, size, pictograms etc., but must at a minimum contain the words:

- High Noise Area
- Hearing Protection Required

Marathon Anacortes Refinery provides information and training on how to identify high noise areas in the information given to contractors, vendors and visitors coming on site.

6.2 Dual Hearing Protection Areas

Areas with noise levels where workers could be exposed to ≥ 100 dBA are designated as dual hearing protection required areas. Dual hearing protection required areas are marked with signs and require workers entering those areas to use dual hearing protection.

Designation of dual hearing protection areas is calculated based on local hearing protection required in an area and determining what decibel level an employee might be exposed to ≥100 dBA.

Signs shall be permanently affixed around the perimeter of areas designated as dual hearing protection areas. The signs may be specific to the location with regards to composition, size, pictograms etc., but must at a minimum contain the words:

- High Noise Area
- Dual Hearing Protection Required

6.3 Temporary High Noise and Dual Hearing Protection Areas

Some tasks may be performed such as during a turnaround or maintenance activities that cause noise in an area to exceed the 85dBA threshold for hearing protection required or 100dBA that requires dual hearing protection. In those instances, temporary, portable, hearing protection required signs will be posted around the edges of the job site for the duration of the job.

There are instances when stationary equipment is not constantly used but when the equipment is in use the surrounding area becomes a high noise or dual hearing protection required area. In those cases, it is acceptable to affix signs in the area that state that hearing protection (or dual hearing protection) is required when the equipment is in operation.

7.0 HEARING CONSERVATION PROGRAM (HCP)

Employees that are required to work in positions that exceed the 85 dBA OSHA action level are included in the Hearing Conservation Program. Operators normally working in the process units are included. Based on current industrial hygiene data, this does not typically include engineering, inspection, administration, planning or other non-process related groups.

Personal noise dosimetry and sound level monitoring results from Industrial Hygiene will determine inclusion into the Hearing Conservation Program. .

Employees included in the HCP are to receive initial and annual training. They are also to receive baseline and annual audiograms as part of medical surveillance.

8.0 ANNUAL AUDIOMETRIC TESTING

As noted above, all employees included in the HCP are to receive baseline and annual audiograms as part of medical surveillance. All audiometric testing requirements will comply with

the HLT-2025 Employee Health Monitoring Examination Protocols Standard and OSHA 29 CFR 1910.95. If a Standard Threshold Shift (STS) is detected during the audiometric test, the Health Services Clinic has 30 days to perform a follow-up audiometric test. A certified Audiologist may be consulted in order to further evaluate possible noise related hearing loss. If a work-related STS has occurred, the Health Services l Clinic shall inform the employee in writing within 21 days of the determination and will take appropriate steps to ensure OSHA criteria for record keeping is met.

9.0 HEARING PROTECTION DEVICES

The Health & Safety Department will ensure several different types of hearing protection devices are available for all employees. All Hearing Protection Devices (HPD) are required to have minimum Noise Reduction Rating (NRR) of 26 and must be ANSI and/or NIOSH approved. If muffs are used as part of dual hearing protection, they must have a minimum NRR of 21. The following formula from OSHA 29 CFR 1910.95 is used to determine a minimum NRR: Required NRR = Measured dBA - (NRR of HPD - 7)/2.

As an example, if the hearing protector NRR is 29, subtracting 7 from 29 indicates 22dB, which is then divided by 2, giving us an 11dB reduction in noise. If an employee's 12-hour shift, average noise exposure (TWA) were 93 dBA or less, the hearing protector would be adequate since 93 dBA – 11 dB = 82 dBA, which is at the 12-hour action level of 82 dBA. The Noise Dosimetry section of this procedure contains additional information on action levels.

HPDs are available throughout the refinery. They are located in the Warehouse, most of the shops and operator field operations centers (FOCs). HPDs must be disposed of and replaced as soon as they become dirty, or when they stop returning to their normal shape when you remove them from your ear canal, whichever comes first.

Note: Hearing Protection Devices are required in all Marathon Anacortes Refinery process units, regardless if you are included in the Hearing Conservation Program. Other areas of the Marathon Anacortes Refinery may also require hearing protection, as identified by the Health & Safety Department and labeled with adequate signage. Hearing protection may also be required in non-process areas where the level of noise is of concern. The Health & Safety Department should always be notified when loud equipment is brought in so noise monitoring can be conducted

9.1 Hearing Protection Device Fit Testing

To ensure that HPDs are properly selected and correctly worn and to document HPD refitting of employees with standard threshold shifts, Marathon Anacortes Refinery uses an HPD fit-testing system. Employees must attain a personal attenuation rating of 20 dB or greater to be considered successfully fitted for hearing protection.

Employees without STS MAY be fit tested at a minimum once per three years.

Employees with an STS MUST use the system to refit HPDs and to document retraining on HPD use.

10.0 NOISE MONITORING

Noise monitoring must be conducted to establish/determine the employee's exposure levels. Regulatory agencies have established clear guidelines on how noise monitoring should be conducted. The Industrial Hygienist or a trained member of the Health & Safety Department will conduct this noise monitoring. Noise testing equipment, including sound level meters and personal noise dosimeters must be calibrated per the manufacturers' instructions. Records of

these calibrations are kept in the Health & Safety Department Filing System. Settings for noise testing equipment should conform with 29 CFR 1910.95 requirements. Noise monitoring should be repeated when changes to the process or equipment alter noise levels.

10.1 Noise Dosimetry

Noise dosimetry establishes the employee's noise exposure on a time weighted average (TWA). The time weighted average is dependent on how many hours the employee typically works. Regulatory agencies have established an 85-dBA action level that determines if the employee should be included in the Hearing Conservation Program. Regulatory agencies have also established 90 dB as the permissible exposure limit (PEL) for noise exposure. Marathon has adopted a more conservative occupational exposure limit of 85 dBA. Employees exposed to noise levels that exceed 85 dBA must have available and use adequate hearing protection. The values below indicate action levels for the following work shifts:

- 8-hour work shifts: noise action level is 85 dBA
- 10-hour work shifts: noise action level is 83 dBA
- 12-hour work shifts: noise action level is 82 dBA

All noise dosimetry data is available for review in the Industrial Hygiene Management Database and complies with Marathon Industrial Hygiene Program (HLT-2001). See Appendix A for dosimeter settings.

10.2 Area Monitoring

Area monitoring evaluates the real-time noise levels. A time weighted average is not used when collecting area monitoring data. Area monitoring data is transferred to Marathon Anacortes Refinery Area Noise Survey Maps. Data from the area noise survey maps will be used to designate high noise areas and dual hearing protection areas. The area noise survey maps shall be reviewed by a local member of the EHS&S Department on a periodic basis, not to exceed three years in length, to ensure that all process changes involving noise emitting equipment have been captured on the current surveys. See Appendix A for overview on how to conduct an area noise survey.

11.0 TRAINING

All employees will receive annual refresher training that covers the following objectives:

- Effects of noise on hearing
- Purpose of hearing protectors
- Advantages, disadvantages, and attenuation of various hearing protector types available for use at the facility
- Instructions on selection, use and care of hearing protectors provided by the facility
- High noise areas at the site
- Description of any changes in hearing protection equipment
- Description of any changes in work processes that might affect noise exposure
- Purpose of audiometric testing, and an explanation of the test procedure
- Where employees can obtain a copy of the regulating occupational noise exposure standard

Information provided in the training shall be reviewed on a periodic basis by a subject matter expert, period not to exceed three years, to ensure that it is consistent with changes in work processes, protective practices, equipment, the contents of this document and regulatory requirements.

The site must make available upon request of the employee or of their representative copies of this noise standard and copies of training materials used by the site.

12.0 RECORDKEEPING

Employees or employee representative designated in writing by the individual employee have access to their noise exposure monitoring data, medical records and training materials used by Marathon. Marathon will give copies of records to the employee or employee representative and maintain documentation of the request and show proof that Marathon complied with the request.

- Area Noise Surveys

  Current Refinery Noise Surveys are located on the Anacortes Sharepoint Site on the EHS page. Area surveys are retained for thirty years.

- Personal Monitoring

  Employee noise exposure monitoring data will be kept in the Marathon corporate Industrial Hygiene database and must be retained for the duration of employment plus thirty years.

- Audiometric Data

  Audiometric test records will reside in the Marathon corporate Medical database and must be retained for the duration of employment plus thirty years.

- Training Records

  Noise training records will be retained by the training department and must be retained according to Marathon Records Management policy.

13.0 REVIEW AND REVISION HISTORY

Revision #	Preparer	Date	Description
0	Mark Willand	10/31/2021	Reformatted and Numbered per Document Control Policy, R-63-001.
1	Michael Fazio	7/31/24	Health Services, clarifications- employees schedule appointments and hearing conservation coverage. Updated Content Custodian and Approver. Line by Line review.

14.0 APPENDIX A – SURVEYS

14.1 Area Noise Survey Overview

When using a sound level meter to conduct area surveys use a Type II Sound Level Meter (SLM). The SLM should have a current factory calibration and should also be field calibrated before use. Use the slow response setting. If the SLM has an A-weighting filter that can be switched on or off, make sure that it is switched to the on position.

There are some noise dosimeters available that provide instantaneous sound level reading in dBA and can be used as Type II sound level meters. Check the manufacturer's information on the instrument to determine if the instrument is suitable for this use and follow manufacturer's instructions for use.

Measurements of area noise levels are generally taken at ear level, approximately 5 feet above walking surface. Noise level readings are taken at a suitable number of positions around an area and are marked on a sketch of the area. Noisy equipment in an area is also identified on the sketch as a noise source. Noise source measurements are taken about 3 feet from noise-emitting equipment.

To obtain a representative noise level reading, a minimum of three readings for each measuring point are taken until there are two that are within 2 dB of each other. The reported value is the average of the values that are within 2dB of each other if there are two pairs of readings within 2 dB of each other; report the average of the higher pair.

14.2 Personal Noise Survey Overview

Personal noise surveys will follow all personal sampling requirements of the Marathon Corporate Exposure Assessment standard.

The dosimeter must be pre and post calibrated.

Settings to be used for the dosimeter to monitor Marathon employees are as follows:

- Exchange rate - 3dB
- Frequency weighting – A
- Response – slow
- Criterion level - 85dBA
- Threshold - 80Dba

The Industrial Hygiene database used by Marathon allows for more than one set of measurements per sample. If the noise dosimeter used allows for simultaneous measurements, in addition to the above Marathon measurements set the dosimeter to also collect measurements, using the OSHA settings below:

- Exchange rate - 5dB
- Frequency weighting – A
- Response – slow
- Criterion level - 90dBA
- Threshold - 85dBA

If the personal noise sample is on a non-Marathon worker use the OSHA settings:

- Exchange rate - 5dB
- Frequency weighting – A
- Response – slow
- Criterion level - 90dBA
- Threshold - 85dBA

The microphone for the dosimeter should be positioned midway between the neck and shoulder in an upright position. Avoid placing the microphone where it could become enfolded in clothing or rub against cloth or other materials.