

1. Objective

The purpose of this procedure is to provide Technical Guidance Note and regulatory framework on controls and mitigation strategies of Noise Hazards associated with QAPCO Operations including contractors' activities. QAPCO's Hearing Conservation Program is designed to meet following main Objectives:

- Hearing conservation for employees who are exposed to or above noise level of 85 dBA averaged over an 8 hours' workday.
- Monitoring of actual noise levels in workplace.
- Estimation of the noise exposures.
- Determination of required hearing attenuation.
- Providing guidelines for new installations.

2. Scope

This Procedure regulates noise and hearing protection across QAPCO Operations, where Occupational Noise has been generated as a part of industrial process.

An effective hearing conservation program shall be administered, whenever employee noise exposures equals or exceed an 8 hours time weighted average of 85 dBA. Employee noise exposure shall be estimated/monitored without regards to any attenuation provided by the use of personal protective equipment.

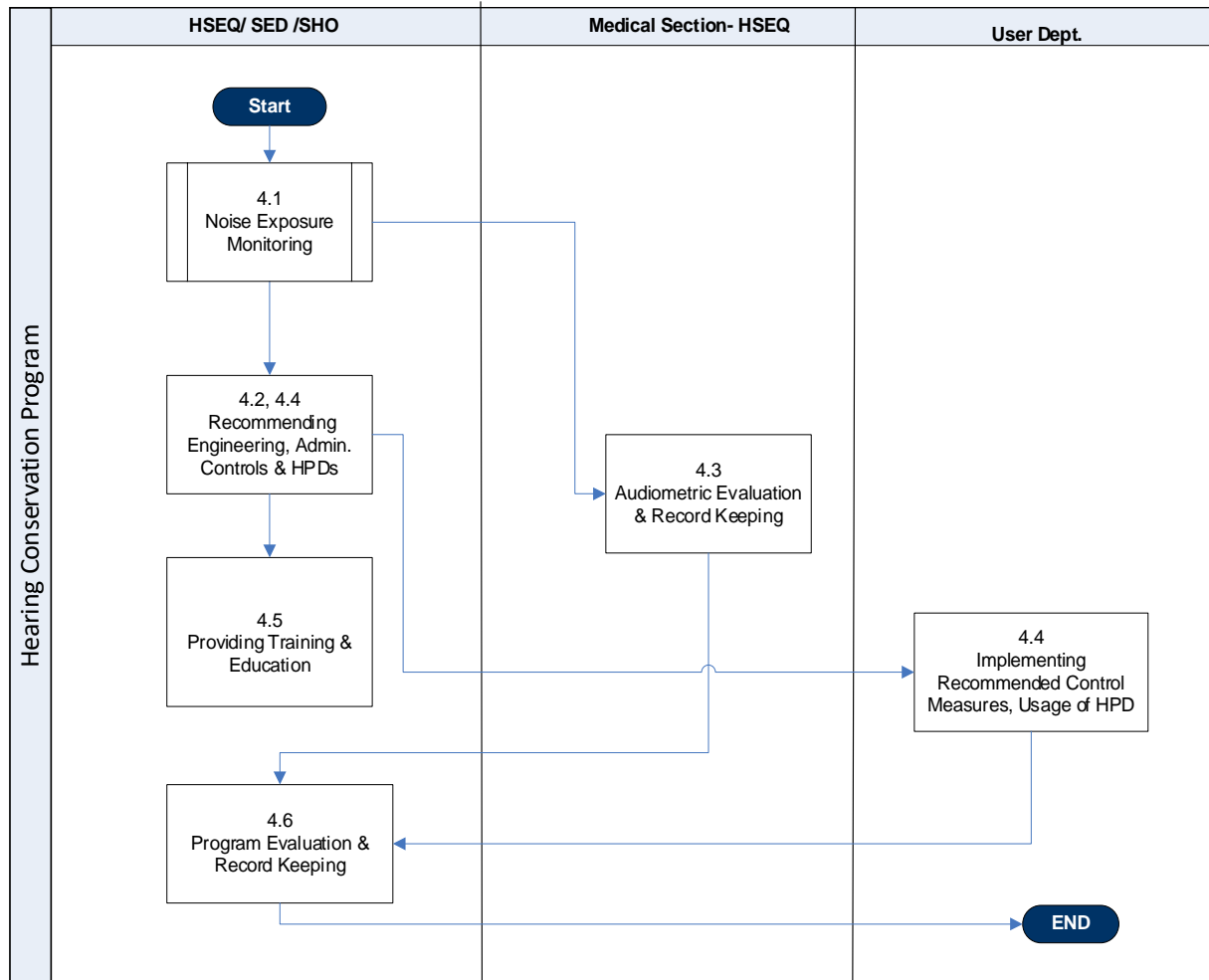
3. Procedure Summary

This procedure (to be referred as technical guidance note) provides information and framework for Identification, Assessment, Evaluation and Control of Occupational health hazards of Noise. Major components of procedure includes: 1) Noise Exposure Monitoring 2) Engineering & Administrative Controls 3) Audiometric evaluation 4) Use of Hearing protection devices 5) Training, Education and Motivation 6) Record Keeping, and 7) Program evaluation.

Table of Contents

4.	Hearing Conservation Process	3
4.1	Noise Exposure Monitoring (Noise Survey):	4
4.2	Engineering & Administrative Controls:	5
4.3	Audiometric Evaluation	6
4.4	Use of Hearing Protection Devices (HPD):	6
4.5	Employee Training & Education:	7
5.	Records	8
6.	Document References / Attachments	8
7.	IT System Requirements	8
8.	Abbreviations / Definitions	9
9.	Revision History	9

4. Hearing Conservation Process



Hearing Conservation Process Clarification

Hearing Conservation Program (HCP) comprises of various tasks and activities aiming to protect workers from occupational health hazards associated with exposure to high noise in QAPCO operations. Seven basic components of HCP consist of: 1) Noise Exposure Monitoring 2) Engineering & Administrative Controls 3) Audiometric evaluation 4) Use of Hearing protection devices 5) Training, Education and Motivation 6) Record Keeping, and 7) Program evaluation. Detailed methodology of HCP is as follows:



4.1 Noise Exposure Monitoring (Noise Survey):

As with any health hazard, it is important to characterize the noise hazard accurately and to identify the affected employees. Noise exposure monitoring should be conducted to meet following main purposes:

- To determine whether hazard to hearing exist or not. (Noise >85 dB(A) or not)
- To determine whether High Noise presents a safety hazard by interfering with speech communications or the recognition of audible warning signals
- To identify employees for inclusion in the HCP
- To identify, assess and evaluate Potentially Controllable Noise Sources (PCNS).

Various kinds of Instrumentation and measurement methods may be used depending on type of survey and noise source. Most commonly applicable measurement types for QAPCO Operations are: 1) Area Noise Monitoring 2) Personal Noise Dosimetry 3) Engineering (Acoustic) surveys.

Area Noise Monitoring: Area/workplace Noise survey shall be carried out by suitably qualified and trained personnel from SED-HSEQD, to identify sources of high noise and group of exposure employees/workers. Duly Calibrated Sound Level Meter should be used to conduct Area noise monitoring as per predefined monitoring frequencies referenced in PR-253-ENV-03- Industrial hygiene Exposure Monitoring Program. Noise monitoring results may be plotted in the form of “Noise contour map” or in Tabular Format.

Permissible Noise Exposure Levels at QAPCO Premises are tabulated as follows:

Daily Permissible Noise Exposure Levels, (Reference: NIOSH- National Institute of Occupational Safety & Health)	
Noise Levels (in Decibels)	Maximum Allowable Time
82 dB(A)	16 Hours / Day
85 dB(A)	8 Hours / Day
88 dB(A)	4 Hours / Day
91 dB(A)	2 Hours / Day
94 dB(A)	1 Hour / Day
97 dB(A)	30 minutes / Day
100 dB(A)	15 minutes / Day
103 dB(A)	7.5 minutes / Day

Nobody shall expose to noise level of 85dBA or more without hearing protection more than 8 hours.

Noise Dosimetry: Dosimetry involves the use of body worn instrument (dosimeters) to monitor an employee’s noise exposure over the entire work-shift. Monitoring Result of one employee can also represent the exposure pattern for other workers in the same area, whose noise exposures are similar. Duly calibrated Noise dosimeters shall be used for employee’s noise dose evaluation at identified area.

Engineering (Acoustic) surveys employ more sophisticated acoustic equipment in addition to sound level meters. These can include Octave band Analyzers and sound level recorders which furnish information on frequencies/Intensity composition of emitted noise. These measurements are used to assess options for applying engineering controls. It is not mandatory for QAPCO HSEQD to procure this additional equipment and to conduct Acoustic surveys by in-house capabilities as it can be achieved by obtaining third party expertise as & when required.

4.2 Engineering & Administrative Controls:

Engineering and Administrative controls are essential to achieve and effective HCP. For hearing conservation purposes, engineering controls are defined as any modification or replacement of equipment, or related physical change at the noise source or along the transmission path that reduces the noise level at the employee’s ear. Typical engineering controls involves:

- Installing a muffler or silencer
- Erecting acoustic enclosures and barriers
- Installing sound absorbing material
- Installing vibration mounts and providing proper lubrications.

User Department-Area Owner (in coordination with concerned department) shall implement applicable type of engineering controls based on technical survey recommendations given by SED-HSEQD.

Administrative controls for hearing conservation, includes High Noise Area Markings and provision of Warning Signs where Noise Exposure is above 85 dB(A). User Department-Area Owner (in coordination with concerned department) shall implement applicable Administrative Controls, such as Placing “High Noise Warning Signs” as per the technical advice & guidance provided by HSEQD.

4.3 Audiometric Evaluation

Roles and responsibilities of identifying needs & implementation of Health surveillance including Audiometry testing, lies with Medical Section of HSEQ Division. Noise Exposure Monitoring Data are the basis of defining Audiometry requirements.

Audiometric testing shall be made available to the employees who are exposed to High Noise. (Equals or exceed an 8 hours TWA of 85 dBA.) It shall be provided at no cost to the employees. Valid baseline audiogram shall be established, against which, subsequent audiograms can be compared. It shall be done with at least 14 hours without exposure to workplace noise or at the time of hiring new employee.

Annual audiogram shall be obtained at least one year after of the baseline audiogram and shall be repeated at same frequency. Annual audiogram shall be compared to baseline audiogram to determine if standard threshold shift has been occurred. Allowance shall be made to presbycusis. Audiometric retest can occur within 90 days of the periodic test (ref. to CDC-NIOSH) if standard threshold shift has occurred.

Audiogram Follow-up: Affected employee shall be informed in writing, within 21 days of the determination. Unless physician determines that the standard threshold shift is not work related, following steps shall be taken:

- Train and provide hearing protectors to him if he was not using it before.
- Provide hearing protectors with more attenuation if he was already using it.
- Sending for clinical audiological evaluation or an ontological examination, as appropriate.

Age correction shall be made to audiogram every year. Audiometers shall be calibrated (if required by type of equipment) as per MOPH (Ministry of Public health), the State of Qatar recommendation or manufacturer's guideline (Follow Whichever is more strengthen).

4.4 Use of Hearing Protection Devices (HPD):

At QAPCO Premises, HPD must be worn while working inside the battery limits of process plant areas. All the identified process areas (having noise levels >85) should be marked with red color in Area Noise Contour maps & Clear sign board (Yellow- CAUTION) stating that 'You are required to wear Ear Protection' should be placed at Plant Entry gates - Sign Board Design as shown in below image.



In addition to process plant areas, HPD may also be necessary for certain activities, i.e. Welding, Grinding, Cutting, Jack-hammering etc... which generates high noise.

There are various types of HPDs Available at QAPCO, such as: Pre-molded Ear-plugs, Foam Ear-plugs, Ear muffs etc. While choosing HPD for any activity at high noise area, employee should always look at the NRR (Noise Reduction Rate) value of Ear-plug or Ear muff. Higher NRR value, gives better protection against high noise. Depend on the workplace noise level, employee have to choose appropriate HPD with required NRR. For example if person is working in noisy area of 90 dB(A), he/she may choose to wear normal ear-plug– which has NRR of 25-29 dB or Ear-Muffs– which has NRR between 25-27 dB. Ear Muffs are very easy to fit, but they normally offer less protection than ear plugs. This is because they only sit over the ears, rather than directly in the ear canal.



Double Hearing Protection: At any work-place locations, **where Noise levels are extremely high (Equal to or Above 100 dBA)- Dual Protection is Mandatory to be used by all personnel working more than 15 minutes in that area.** Based on the NRR Values of available types of hearing protection at QAPCO, we can achieve effective noise protection as below:



Hearing Protection Vs. Noise Reduction Rate	Ear Plug.	Ear Muff	Dual Protection
Noise Reduction Rate	29 dB	27 dB	34 dB

Reference: NIOSH- List of Personal Hearing Protectors and Attenuation Data

4.5 Employee Training & Education:

To obtain active participation in the HCP by employees, it is necessary to train, educate and motivate them in order to mitigate adverse health effects of high noise exposures. Exposed employees shall be trained on following contents:

- The effect of noise on hearing ability
- Purpose of hearing protectors.

- Purpose of audiometric testing, and explanation of the test procedures.

QAPCO Employee’s Training & Evaluation shall be conducted as per HSE Training Process

5. Records

The owner / executor shall maintain the following records / documents for reference:

#	Document / Record name	Retention period	Retention policy	Retention method	Classification
1	Technical reports, Survey findings, Improvement action Plans. (OHRA Reports, Noise Monitoring reports)	5 Years	SED will maintain records	Soft	Internal

6. Document References / Attachments

#	Document ID	Document name	Summary of dependency
6.1 Document References			
1	29 CFR-1910.95	OSHA- Occupational Noise Exposure	Reference
2	QV-00-NHT-F50-00003	QVC Project Specification Volume 2, Document	Reference
3	CDC- Alice H Suter & John R. Franks	Practical Guide to effective Hearing Conservation Program in Workplace- By US Department of Health and Human services- Centre for Disease Control-NIOSH	Reference, Sec-4
4	PR-253-ENV-03	QAPCO Procedure on: Industrial hygiene Exposure Monitoring Program	Reference, Sec-4
6.2 Attachments			
	None	None	

7. IT System Requirements

#	IT system module name	Summary of IT system module use
1	NA	NA

8. Abbreviations / Definitions

#	Abbreviation / Key word	Definition summary
1.	'A' Scale:	It is one of the three scales designed to evaluate the human ear response to noise. 'A' scale is thought to provide a rating of industrial broadband noise that indicates the injurious effects of such noise on the human ear.
2.	Attenuation	It is the reduction in the heard noise level provided by use of a hearing protector.
3.	Audiogram	A chart, graph or table resulting from an audiometric test, showing an individual hearing threshold level as a function of frequency.
4.	Continuous Noise	If the variation in the noise level involves maxima at intervals of 1sec or less, it is to be considered continuous. This is generally a broadband noise of approximately constant level.
5.	Decibels (dBA):	Unit used to express the sound level on 'A' Scale.
6.	Hearing Threshold	A minimum sound which can be heard by human ear, it is 1 dBA referred to sound pressure level of 20 u Pa (micro Pascal).
7.	HCP	Hearing Conservation Program.
8.	HPD	Hearing Protection Device, i.e., Earplug or ear muff
9.	Impact or Impulsive Noise	It is a sharp burst of sound, generally less than one-half second in duration and does not repeat more than once per second. e.g., hammer blows or explosions.
10.	Presbycusis	Change in the hearing capability of a person due to aging factor.
11.	Standard Threshold Shift (STS)	This is the change in the hearing threshold relative to the baseline audiogram of an average of 10 dBA or more at 2000, 3000, and 4000 Hz in either ear, after giving allowance of presbycusis.
12.	PCNS	Potentially Controllable Noise Sources.
13.	NRR	Noise Reduction Rate
14.	QAPCO	QAPCO Means QAPCO, Qatofin & QVC
15.	HSEQD	Health Safety Security Environment and Quality Divison

9. Revision History

Rev #	Date	Section No.	Reason for revision / modification
00	26.04.2018	All	New Procedure prepared as per new organization and BT-4 documents. Integration of QVC Procedure on Hearing Conservation Program (P-VGEN-617)
01	As per ISO Achiever Publishing Date	All	Changed Procedure number from PR-253-ENV-04 to PR-SE-04. Revised the procedure as per new template requirement. Adoption of management decision under OSTF Committee regarding mandatory usage of HPD at Process plant areas.

