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Project Hearing Conservation Program Procedure

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Project Hearing Conservation Program Procedure

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1.0 PURPOSE

The purpose of this Procedure is to provide requirements for protection against hearing loss. Attachment 1 provides a flow chart of the Hearing Conservation Program process.

2.0 SCOPE

The scope of this procedure applies to all works performed under all Government Construction Contracts executed throughout the Kingdom of Saudi Arabia.

3.0 DEFINITIONS

Definitions	Description
Exposure Limit Value	The maximum level of noise to which anyone may be exposed, as measured at the ear.
A-Weighted Network	A scale incorporated in sound level instruments that most approximates the response of the human ear to various sound frequencies.
Attenuation	The reduction of noise achieved by physical barriers, mufflers, personal hearing protection devices, distance, etc.
Continuous Sound	Sound intervals no greater than 1 second apart.
CSM	Construction Site Manager
FM	Facility Manager
Decibel (dB)	A unit of measurement of sound level.
dB(A)	A unit representing the sound in decibels measured on the A-weighting network of a sound level meter/dosimeter. Sound is filtered to replicate the noise heard by the human ear, and this unit is therefore more appropriate for determining worker exposure to noise.
Dose	Exposure to sound levels expressed as a percentage of the occupational exposure limit. A 100% dose requires participation in a Hearing Conservation Program (HCP).
Dual Hearing Protection	Simultaneous wearing of earplugs and earmuffs. Dual hearing protection shall be worn whenever exposure is above the adjusted Noise Reduction Level (NRR) level of the ear piece, or 105 dB(A) exposure duration defined in Table 1 in Section 7.3 of this procedure.
Employee Exposure	Employee exposure means exposure to noise without regard to use of hearing protection.
Exchange Rate	The concept that an increase or decrease of 3 dB(A) noise level will double or halve the allowable noise dose. For example, a noise increase from 85 dB(A) to 88 dB(A) will decrease allowable exposure time from 8 to 4 hours.
HCP	Hearing Conservation Program
HSSE	Health, Safety, Security and Environment
IHRS	Industrial Hygiene Records System
Impulse/Impact Sound	A sound burst that is characterized by a sharp rise and rapid decay in sound levels and is greater than 1 second in duration between sound intervals.
Noise	Noise is defined as unwanted sound pressure. The physiological injury caused by working in elevated noise levels is explained as damage to the hair-like nerve follicles located in the cochlea, which transmit hearing sensation from the inner ear to the brain. Repeated and/or prolonged exposure to elevated levels of noise will result in auditory fatigue of these follicles and eventual function failure of the cochlea.

Definitions	Description
Noise Dosimeter	An instrument that integrates a function of sound pressure over a period in such a manner that it directly indicates a noise dose. The instrument is set at a 3 dB(A) exchange rate.
Noise Reduction Rating (NRR)	The number of decibels by which the hearing protection device has the capability to reduce noise levels. The reduction equivalent of the device is: Ear muff = 75% of NRR Foam ear plugs = 50% of NRR All other ear protection = 30% of NRR
Occupational Exposure Limit (OEL)	The exposure levels and allowable exposure periods that are defined in Table 1 below. An 8-hour time-weighted average (TWA) of 85 dB(A), or 100% dose, will require an HCP to be in place.
Overexposure	Exposure that exceeds the noise level durations defined in Table 1 below regardless of the use of hearing protection devices.
Sound Level Meter	An instrument used to measure instantaneous noise levels. It is typically used for point source measurements of equipment or activities and/or establishment of boundaries. This instrument should not be used to determine 8-hour Time Weighed Average TWAs for OEL comparison.
Standard Threshold Shift (STS)	A change in hearing threshold relative to an average of 10 dB or more at 2,000; 3,000; and 4,000 Hz in either ear. This shift is permanent hearing loss and is an occupational illness.
Temporary Threshold Shift (TTS)	A temporary but reversible hearing loss following excessive sound pressure level exposure that may occur from short-term noise exposures.
Time-Weighted Average (TWA)	The sound level for an 8-hour exposure period covering a range of 80–140 dB(A) with 85 dB(A) criterion and 3 dB exchange rate.

4.0 REFERENCES

- OSHA 29 CFR 1910.95 Occupational Noise Exposure
- OSHA 29 CFR 1926.101 Hearing Protection
- EPM-KSS-PR-000003 Project Personal Protective Equipment Procedure

5.0 RESPONSIBILITIES

5.1 Construction Site Manager (CSM) / Facility Manager (FM)

- The CSM/FM shall ensure that this procedure is implemented. If an onsite HSSE representative has not been designated, the responsible CSM/FM shall coordinate with the designated HSSE Manager to determine requirements.

5.2 HSSE Supervisor

In conjunction with the CSM/FM, the HSSE Supervisor is responsible for implementing and administering this Procedure. The HSSE Supervisor will ensure that an HCP is established that includes the following elements:

- Assessment of the 8-hour TWA exposure levels in decibel and percentage dose for each task and for routine activities that may exceed the 85 dB(A) OEL. Historical data may be used but with caution because site and task conditions may not be the same as the historical data. Exposure assessments shall be performed by a person experienced with the use of sound-measuring instruments, noise standards, and control methods.
- A personal protective equipment (PPE) program that complies with Section 5.6 of EPM-KSS-PR-000003 Project Personal Protective Equipment Procedure and this procedure.

- Evaluation and implementation of engineering controls for tasks that exceed 85 dB(A) TWA.
- A site-specific Hearing Conservation Training Program adapted to site conditions.
- Accurate project records maintained on the Project and input into the Industrial Hygiene Records System (IHRS).
- Actions to correct any deficiencies that deviate from compliance with this Procedure.
- Ensuring that employees wear hearing protection if noise levels may exceed 85 dB(A) TWA or 100% dose limit.
- Ensuring that equipment has been properly evaluated and accepted for their work environment.

5.3 Supervisors

Superintendents, foremen, and other responsible supervisors are responsible for:

- Ensuring that work areas and tasks under their responsibility have been assessed for noise and that locations with high noise levels are posted in compliance with this Procedure.
- Ensuring that engineering and administrative controls have been assessed for their work locations/tasks and ensuring the implementation of such controls.
- Identifying and alerting HSSE of employees who are or will be potentially affected by the requirements of this Procedure.
- Identifying employees who may be exposed above 85 dB(A) TWA or 100% dose.
- Ensuring that employees who may be exposed above 85 dB(A) TWA or 100% dose have been trained in accordance with the project's HCP training requirements.
- Enforcing the requirements of this Procedure.

5.4 Employees

Employees are responsible for:

- Wearing noise measuring devices
- Attending HCP training.
- Wearing PPE.
- Complying with this procedure.

6.0 RISK ASSESSMENT

An integral aspect of the work planning process is the performance of a proper risk assessment. Risk Assessments must be conducted at the Planning Stage to identify the hazard risks and determine control measures. When employees are subjected to sound exceeding those listed in Table 1 (below), feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table 1 personal protective equipment shall be provided and used to reduce sound levels within the levels of the table.

The Risk Assessments that shall be conducted at the Planning Stage are as follows:

- Project Risk Assessment.
- Work Method Statements (WMS)
- Job Hazard Analysis (JHA).
- Safety Task Analysis and Risk Reduction Talk (STARRT).

It is imperative that prior to beginning any work activity, a STARRT briefing occurs to discuss the contents of the WMS/JHA which includes mitigations for any other hazards noted by the crew at the jobsite. The discussion shall also include job steps, expected hazards associated with the activity, and the mitigation and protection methods that shall be implemented to prevent incidents.

If circumstances change by way of the environment, other work crews are in the area, additional hazards are now present, change of methodology of the task etc.…. another STARRT briefing shall occur.

The Hierarchy of control shall be used to reduce the likelihood of an incident occurring.

- ***Elimination*** (Remove the Hazard)
- ***Substitution/Isolation*** (Replacing material, process or hazard with a lower risk one/ separate people from the hazard (such as suitable guarding, distance, etc.)
- ***Engineering Controls*** (Redesign or replacement of plant and equipment)
- ***Administration Controls*** (Procedures, training, signage)
- **PERSONAL PROTECTIVE EQUIPMENT**

No work is to commence until the above has been implemented and signed by the relevant Supervisor in charge.

7.0 REQUIREMENTS

7.1 Exposure Prevention and Control

The Project/facility will be required to develop and implement an HCP that meets or exceeds the requirements of this procedure if the Hazard Assessment Review indicates potential noise exposure at or above the levels specified in Table 1. All Projects and facilities shall meet the requirements of the host country standard but cannot be less stringent than this procedure. However, if the host country standard is ***more stringent***, the host country standard will take precedence.

When noise monitoring results indicate that any worker may be exposed to levels exceeding the 85 dB(A) (TWA) OEL derived from Table 1, the worker will be enrolled in the Project's HCP. Key components of the HCP will include:

- Written HCP process.
- Noise monitoring.
- Training.
- Hearing protection devices.
- Program assessment.
- Engineering and administrative controls.
- Posting.
- Employee exposure notification.
- Periodic hearing surveilence examination
- Health screening and surveilence

7.2 Hazard Assessment Review and Planning

A noise hazard assessment review shall be performed during activity planning and before implementation to identify known tasks and activities with the potential to exceed the 85 dB(A) 8-hour TWA and dose limits. The Project/facility may refer to historical data, plant and equipment noise emission tables, and other sources where applicable but must be verified through onsite monitoring. In many countries, manufacturers and suppliers have a legal duty to provide information on noise levels generated by their equipment. In other countries, no such requirements exist and, therefore, proper monitoring and assessment per the requirements of this Procedure are essential.

Each Project/facility shall plan for:

- Noise measurement assessments during work activities, including instrumentation (where applicable).
- Employee training.
- Employee hearing protection devices.
- Assessment and implementation of engineering controls.
- Assessment and implementation of administrative controls.

The requirement for engineering controls and/or hearing protection will be evaluated by the Project HSSE Supervisor. If data are available, the results of this evaluation shall be described in the hazard analysis section of the HSSE Execution Plan.

7.3 Noise Monitoring

Noise surveys will be conducted when noise levels have the potential to exceed 85 dBA and/or when the adequacy of engineering controls and personal protective equipment is evaluated.

7.3.1 Occupational Exposure Limit Values for Noise

Table 1 shows the acceptable noise levels for employee exposure without the use of hearing protection.

Hearing protection, with the appropriate adjusted NRR, must be provided for exposures exceeding those outlined in Table 1.

Noise monitoring shall be performed to ensure that workers are not exposed to harmful noise levels. An increase of three decibels is equivelent to the doubling of the noise level and would require an equivelent halving of the exposure time, check the table below :-

Hours duration per day	Sound level [dBA]
16	82
12	83
10	84
8	85
4	88
2	91
1	94
30 min	97
15 min	100
7.5 min	103
357 sec	104
283 sec	105
89 sec	110
28 sec	115

Table 1: Noise Level Duration, 3 dBA Exchange Rate

7.3.2 Instrumentation

The calibration of both the sound level meter and the dosimeter will be checked before and after each use in accordance with the manufacturer's recommendations.

All sound level meters shall have the capacity to measure continuous sound from 80 dB(A) to 140 dB(A) on the “A” scale network. The sound level meter shall meet design and operation specifications applicable to the authority having jurisdiction and meet the requirements of this Core Process (i.e., 3 dB(A) exchange rate).

All noise dosimeters shall have the capacity to measure continuous noise on the “A” scale network using a 3 dB(A) exchange rate and must be capable of integrating all continuous, intermittent, and impulse noise levels from 80 dB(A) to 140 dB(A). The dosimeter shall be able to indicate the time/duration the noise level was at or above 115 dB(A). Dosimeters shall be capable of determining TWA dB(A) measurement and percent dose. Dosimeters shall meet design and operation specifications applicable to the authority having jurisdiction and meet the requirements of this core process (i.e., 3 dB(A) exchange rate).

7.3.3 Noise Monitoring Strategy

The noise monitoring strategy will be designed by the HSSE Supervisor, or designee, to identify employees for inclusion in the HCP and to enable the proper selection of hearing protectors and engineering and/or administrative controls. Noise monitoring shall be performed by HSSE persons knowledgeable in noise monitoring strategy, noise monitoring equipment and standards, and the requirements of this Procedure. In all cases noise exposure should be reduced as far as is reasonably practicable and Projects shall not exceed the limits found in Table 1 without engineering controls and personal protective equipment in place.

Area monitoring should not be used to determine an employee’s exposure. Area monitoring should be used only to determine boundary noise levels, posted areas, point source noise levels, and general environmental conditions.

Initial noise monitoring surveys shall be conducted at the start of work activities. Monitoring surveys shall be conducted when:

- The activities and job classifications with the potential to result in worker exposures exceeding the 85 dB(A) OEL are being identified.
- The adequacy of engineering, administrative, and PPE control measures is being assessed.
- There is a change in process, equipment or controls that may increase noise exposures to levels above the 85 dB(A) OEL.

Attachment 2 is a sample of a form used for documenting noise monitoring results.

A representative number of workers in each job task and job classification shall be monitored. If there is no discrimination of work tasks between employees within a job classification, all workers within that job classification shall be considered to have similar exposure. The resulting exposure data shall be applied to all affected employees, by name. A representative number of employees shall be considered the number of employees that will produce reliable statistical data and justification of the correlation application.

7.4 Noise Prevention Methods

7.4.1 Engineering Controls

The first line of defense against noise exposure is engineering controls. Projects and facilities shall always provide onsite verification of the effectiveness of the control measures through noise monitoring data. Specific engineering controls may include:

- Alternative work methods that will not require noisy equipment.
- Noise source isolation such as erecting suitable sound barrier material between the machines and employees.
- Vibration dampeners.
- Mufflers.
- Equipment with noise reduction controls in place.
- Equipment with low noise output and local noise attenuation fitted to it.
- Other feasible engineering controls when noise is inherent in the task.

7.4.2 Administrative Controls

The second line of defense against noise exposure is administrative controls. Projects and facilities shall provide onsite verification of the effectiveness of the control measures through noise monitoring data. Specific administrative controls may include:

- Ensuring that equipment is well maintained and the noise attenuation equipment is fitted and working.
- Arranging noise-producing plant equipment, as practicable, at a distance from employees.
- Limiting access, when feasible, to noisy areas and planning work methods that will reduce exposure times to noise, and shutting down noisy equipment when it is not needed.
- Erecting signs and barriers prohibiting unauthorized personnel from entering noisy areas.
- Monitor the HCP, including the effective use of protective hearing devices.

7.4.3 Personal Protective Equipment (PPE)

The HSSE Supervisor shall select the proper hearing protective devices based on the noise levels and the NRR of the devices.

- Hearing protectors shall be used when engineering and/or administrative controls have not yet been determined, are not feasible, or fail to reduce noise levels to the 85 dB(A) OEL.
- Double hearing protection shall be used when exposure reaches 105 dB(A), as defined in Table 1.

Each Project and facility shall provide a selection of at least two types of earplugs (formable, premolded, banded, or custom) and one type of earmuff that meets appropriate attenuation requirements. Employees must wear suitable and effective hearing protectors always when the 85 dB(A) and 105 dB(A) OELs have been exceeded. Provisions shall be made to engage the employees in the selection of suitable devices.

Provisions shall be made that afford employees ready access to hearing protection devices. Rules shall be enacted requiring devices to be carried by employees participating in the program. Inspections, the Safety Task Analysis and Risk Reduction Talk (STARRT), and other programs shall include hearing protection requirements. Work rules shall reference hearing protection. Line managers shall monitor and enforce the use of the hearing protection devices.

7.5 Hearing Protection Device Selection

Hearing protection shall not interfere with the wearing of other PPE. In areas where hearing protection or noise levels interfere with communications, suitable alternative arrangements shall be in place for alerting employees in the event of an emergency.

Hearing protection device selection shall be compatible with other required PPE, cleanliness, comfort, ear canal size, communication needs, and intermittency of exposure. The selection of an appropriate standard of hearing protection will be based on noise dosimeter data.

The adequacy of noise attenuation will be reevaluated based on the monitored noise level and the protection device NRR rating whenever employee noise exposures increase to the extent that the hearing protectors provided may no longer provide adequate attenuation. If necessary, more effective hearing protectors will be provided.

Note: *Employees who have experienced a standard threshold shift must wear hearing protectors for any noise level period above 85 dB(A). Attenuation by the hearing protection device shall reduce the exposure level to or below 85 dB(A*).

7.6 Training

Employees who are exposed to noise at or above the levels defined in Table 1 will receive the training required by this program. Training shall be repeated annually for each employee. Information provided in the training shall be updated, as necessary, to be consistent with changes in protective equipment, work processes, and/or activities.

As a minimum, the following training topics must be discussed:

- Site-specific noise hazards and noise levels of typical equipment used.
- Early symptoms of hearing loss.
- Hearing physiology.
- Engineering controls being used.
- The purpose of hearing protectors, including the advantages, disadvantages, and attenuation levels of various types of protectors.
- Instruction on selection, fitting, use, and care of hearing protectors.
- Practical (hands-on) training in fitting and use of the hearing protection in use at the site.

Informational materials for the hearing conservation program will be available to affected employees or their representatives. In addition to the training, supervisors are to demonstrate leadership and share the appropriate control measures with employees during the STARRT briefing.

7.7 Audiometric Testing

Where applicable, personnel engaged in work where high noise levels cannot be attenuated may be subjected to screening, which may include a baseline test, to assess if any impairment has occurred. Any such testing shall be in accordance with the requirements of the authority having jurisdiction for the project/facility location.

Projects/facilities that are required to perform audiometric testing by either contract or host country regulations shall ensure compliance with applicable requirements.

7.8 Employee Notification

Employees exposed at or above an 8-hour TWA of 85 dB(A) will be notified of the results of the monitoring. Affected workers will be notified verbally, or by posting, or in writing within 48 hours of any noise exposure above levels defined in Table 1. Attachment 3 provides a sample employee notification form. Verbal notification can be documented in a tool box meeting. Any posting must be in a conspicuous location. If the notification is in writing, documentation must be maintained in the individual's file.

Noise monitoring records shall be provided to employees upon receipt of a formal written request.

7.9 Documentation

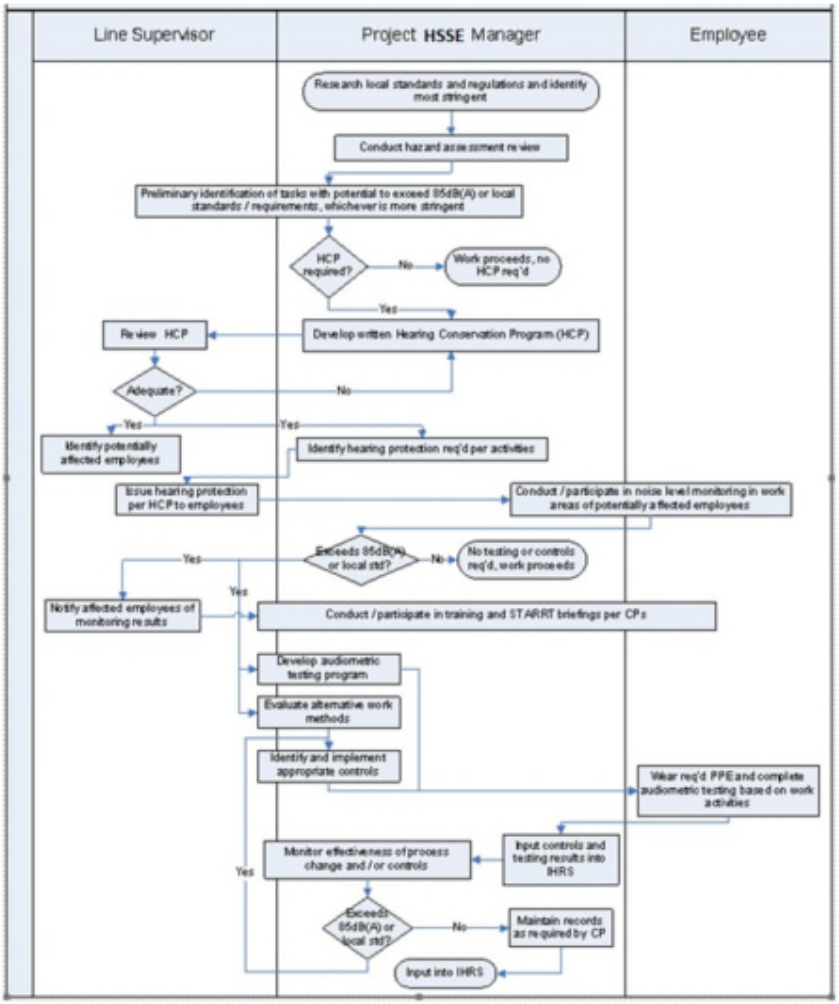
Noise monitoring forms Attachment 2, employee notification forms Attachment 3, noise testing results/data and training records shall be maintained for at least 75 years.

8.0 ATTACHMENTS

1. Hearing Conservation Program Flowchart
2. EPM-KSH-TP-000015 - Noise Monitoring Form Template
3. EPM-KSH-TP-000016 - Employee Notification Form Template

Project Hearing Conservation Program Procedure

Attachment 1 - Hearing Conservation Program Flowchart



Project Hearing Conservation Program Procedure

Attachment 2 - EPM-KSH-TP-000015 - Noise Monitoring Form Template

PART I

DATE: _____

EMPLOYEE NAME: _____
*(If more than one, please list on other side)

SOCIAL SECURITY NO.: _____
(or other unique ID Number)

JOB CODE: _____ TASK DESCRIPTION: _____

JOB SITE LOCATION: _____ PROJECT NO.: _____

EMPLOYER NAME: _____ TELEPHONE NO.: _____

PART II

AREA SAMPLE: _____ PERSONAL SAMPLE: _____ NUMBER OF WORKERS EXPOSED: _____

HEARING PROTECTION IN USE? YES ☐ NO ☐ IF YES, NRR _____

RUN TIME: _____ SOUND LEVEL: _____ dBA PEAK LEVEL: ___ dBA

TL- RUN TIME TWA: ____ dBA

TL- 8-HOUR TWA: ____ dBA

TL- 8-HOUR DOSE: ____ %

SAMPLED BY: _____ TITLE: _____ DATE: _____

PART III

NOISE MEASURING INSTRUMENT NAME: _____ SERIAL NO.: _____

CALIBRATING INSTRUMENT NAME: _____ SERIAL NO.: _____

BEFORE SURVEY CHECK/CALIBRATION: ___OK ___NOT OK; TIME: _____ AM PM; AT _____ dB; CODE: _____

AFTER SURVEY CHECK/CALIBRATION: ___OK ___NOT OK; TIME: _____ AM PM; AT _____ dB; CODE: _____

CALIBRATED BY: _____ TITLE: _____ DATE: _____

PART IV

NOTE 1. The noise measuring instrument must be set in the "run" mode to obtain the above data.
NOTE 2. LTL-TWA readings * 85 dBA shall require compliance with hearing conservation requirements.
NOTE 3. PARTS I and II will be used to update the Health Database.
NOTE 4. The original copy of this form shall be maintained by PDCC (project document control center).
NOTE 5. CODE – an encoded number which identifies the internal switch setting (refer to Instrument - Instruction manual).
NOTE 6. OL-Time is the length of time the noise equaled or exceeded 115 dBA.

Project Hearing Conservation Program Procedure

Attachment 3 - EPM-KSH-TP-000016 - Employee Notification Form Template

Preparer:
Project and Project No.:
Work Location:
Work Being Conducted:

HAZARD: Noise				
Employee's Name/ Badge #	**Date of Monitoring**	**Monitor No.**	**Results: 8-hour average (TWA)**	**8-hour Exposure Limit***
			dB(A)	85 dB(A)
			dB(A)	85 dB(A)

Hearing protection in use: Type, manufacturer, model, NRR

_____

_____

_____

Hearing Protection adequate: Yes/No

Current engineering controls in place: Write in type

_____

_____

_____

Current safe work practices in place: List

_____

_____

_____

Corrective Actions Required when Personal Exposure is Above Occupational Exposure Limit(s)	
Corrective Action Needed (Substitution, Engineering Controls, Administrative Controls, PPE):	**Implementation Due Date:**

HSE Signature	**Date**
Signature of Worker	**Date Received**