JOSOP 515 - Hearing Conservation Program

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Contents

1.0 Purpose and Scope

Purpose

The purpose of this Joint Operations Safe Operating Procedure (JOSOP) is to comply with SA/PZ Occupational Hygiene OE Process, KPC HSE standards, State of Kuwait regulatory requirements, and international legal requirements regarding noise exposures, monitoring and control, and hearing conservation in order to protect the hearing of personnel in the workplace. The most stringent of these regulations shall be applied.

Scope:

This JOSOP covers operations and work carried out in areas within JO operational control, and it is applicable to both JO and contractor employees.

2.0 Definitions

“Action Level”: 50% of Allowable Daily Dose (50% ADD). The action level is equivalent to an 8-hour time weighted average of 82 dB(A).

“Administrative controls”: Efforts by management to limit personnel’s exposure by modifying their schedules (e.g. rotation) or locations or by modifying the operating schedule of noisy equipment.

“Allowable Daily Dose (%ADD): An indication of employee exposures to a varying noise levels over a length of time compared to the maximum unprotected dose permitted by Kuwait EPA (i.e., 100% ADD).

"Annual Audiometric Testing (AAT) group”: Individuals who have annual audiometric testing and/ or medical clearance under fitness-for-duty, to continue to work in high noise areas, jobs, or assignments.

"Decibel (dB)”: Unit used to express the intensity of sound (sound pressure level).

"dB (A)": The sound pressure level in decibels on an “A” filter of a sound level meter or noise dosimeter weighted to approximate the frequency response of the human ear. The dB (A) is the standard unit of sound pressure level measurement.

"Dose monitoring": Noise readings that are an integrated over time, providing an average exposure reading for a given period of time (e.g., eight-hour workday).

"Dosimeter ": An instrument that measures sound levels over a specified interval, stores the measurements, calculates the sound as a function of sound level and sound duration, and then describes the results in terms of dose, time weighted average, and other parameters, e.g., peak level, and equivalent sound level (LEQ).

"Engineering Control": Any use of engineering methods to reduce or control the sound level of a noise source by modifying or replacing the equipment or by making any physical changes at the noise source or along the transmission path (with the exception of hearing protectors).

“Fence line noise”: Noise level measured at the fence line of an industrial property towards the residential and industrial neighbors. It must be kept below the local statutory levels sets for the zone of activity (environmental monitoring).

“Fit test (hearing protectors)”: An audiometric test performed with insert-type earplugs in place to document the approximate protection of the inserts for the individual. The insert-type earplugs should generally provide 10 to 15 dB of protection at each frequency.

“Hearing conservation program (HCP)”: A management system with elements that are designed to help prevent hearing loss in personnel.

“Hearing protection devices (HPDs)”: Ear plugs, otoplastics and/or earmuffs designed to help prevent significant hearing loss and used as the last line of defense against noise in the work environment where engineering and/or administrative controls have not reduced personnel exposure to safe levels.

“Noise”: The undesired sounds resulting from sound waves emitted from indoor or outdoor sources which have immediate rapid effect on the activity of workers and which may affect hearing ability or disturbance in the neighborhood.

“Noise dose”: Noise exposure expressed as a percentage of the noise exposure limit.

“Noise-induced hearing loss”: Diminution of hearing due to prolonged, habitual exposure to high-intensity noise.

“Noise reduction rating (NRR”): A single-number rating method that attempts to describe a specific hearing protector (i.e., brand/mode) based on how much it reduces the overall noise level in laboratory testing.

“Noise-sensitive individual”: An individual who is unusually susceptible to noise-induced hearing effects.

“Periodic audiometric testing (PAT) group”: Individuals who are exposed only occasionally to noise who are offered audiometric testing every two years or with periodic medical examination.

“Personnel”: Include employees and contractor employees of Joint Operations who receive day-to-day direction from Joint Operations.

“Presbycusis”: Change in hearing thresholds thought to be related to physiological changes that occur with age.

“Required Noise reduction rating”: The minimum noise reduction rating desired for hearing protectors to attenuate workplace noise to the pertinent level.

“Retrofit controls”: Controls put in place after the installation of equipment to control noise exposure in the workplace and at fence line.

“Sound level meter (SLM)”: A device that measures sound intensity and provides readout of the resulting measurement.

"Standard threshold shift (STS)": A change in a person's hearing threshold level in either ear relative to his or her baseline audiogram of an average of 10 dB or more at frequencies of 4000, 3000, and 2000 Hertz (Hz). In determining whether a standard threshold shift has occurred, allowance may be made for the contribution of ageing (i.e., presbycusis) to the change in hearing level.

"Supervising medical professional": The individual who is responsible for the medical screening (audiogram) of personnel in a hearing conservation program (i.e., a physician, certified audiologist, or otolaryngologist).

"Temporary threshold shift": A hearing loss suffered as a result of noise exposure, all or part of which is recovered during an arbitrarily determined period of time away from the noise.

3.0 Requirements

3.1.0 Allowable Noise Exposure Limits

3.1.1 Allowable Noise Exposure Limits at Work Environment

Threshold limit value (TLV) or allowable exposure limit of employees to noise in an industrial work environment varies according to duration of exposure and should not exceed the limits specified in Appendix No. 4-1 Kuwait EPA regulation. Kuwait EPA has set 85 dB (A) Time Weighted Average exposure to noise as an allowable limit for 8 hours a day work, for 5 days work week. Some key exposure levels and time duration from Appendix No.4-1 are re-produced below in Table 1.

Noise levels in an industrial work environment must be maintained below 85 dB(A), whenever feasible, without regard to the use of hearing protection. Where these levels are exceeded, exposures must be controlled using the program elements of a hearing conservation program.

Table 1: Allowable Noise Limits at Work Environment by K-EPA

Allowable Noise Limits (Sound pressure required to reach 100% Allowable Daily Dose)		
Scheduled Time duration (shift duration) per day		**Exposure to sound Pressure level in dB(A)**
Hours	**Minutes**	
16		82
12	42	83
10	05	84
08		85
04		88
02		91
01		94
0	30	97
0	15	100

3.1.2 Allowable Noise Exposure Limits in buildings inside the Industrial Establishment

Noise levels in buildings inside the industrial establishment should not exceed the allowable noise levels specified in Appendix No. 4-2 Kuwait EPA regulation. These are reproduced below in Table 2.

Table 2: Allowable Noise Limits in buildings inside the Industrial Facilities Buildings

Type of location inside Industrial Establishment	**Allowable Noise Level Limits in dB(A)**
Conference room	35 to 40
Offices	40 to 45
Workshop offices	45 to 50
Laboratory, measurement or inspection rooms	50 to 55
Repair workshops	60 to 65
Canteen	50 to 55
Production area & fan rooms, compressor rooms, etc	85 to 90

3.1.3 Allowable Noise Exposure Limits for indoor noise in Non-Industrial Environment

Noise levels in an indoor non-industrial environment should not exceed the allowable noise levels specified in Appendix No. 4-3 Kuwait EPA regulation.

3.2.0 Noise monitoring

3.2.1 Noise-level surveys: Noise-level surveys must be conducted at the following intervals:

- Initially at all work areas including office buildings and fence line.

- Every 6 months a fence line noise surveys must be performed if residential or industrial neighbors could be affected by noise emissions. The measurements cover the different time periods as regulated. The results must be recorded and analyzed for trends. Such readings must also be performed after addition or dismantling of equipment having impact on fence line noise. Statutory complaints from neighbors must be investigated and reported as environmental incidents.

- Annually for all areas with noise levels of 80 dB (A) and above unless an operation has at least two years of data that show that noise levels remain consistent. In this case, the interval can be extended to every 24 months (two years).

- A baseline monitoring of noise levels must be conducted under worst condition inside Industrial Facility Buildings and Non-Industrial Office Buildings to evaluate compliance with values given in Appendix No. 4-2 and Appendix 4-3 of K-EPA regulation, and to initiate improvements where necessary. The noise level monitoring should be repeated whenever any significant changes are noticed or at least every twenty four months (two years).

- Whenever any significant changes in equipment or process occur that may affect noise levels or when personnel notice increases in noise levels.

3.2.2 Field measurements

Properly conducted noise level measurements and/ personal noise dosimetry measurements are the basis for evaluation of personnel exposure, compliance with regulations, and selection of noise control procedures. Guidance on equipment selection, calibration of equipment, and procedures for noise monitoring, and dosimetry given in "Chevron Guidance for Exposure Assessment, Prevention and Control", and in KPC Corporate HSE Standard, "Noise Exposure Control and Management" should be followed.

3.2.3 Personal exposure (noise dose) monitoring

Personal exposure (noise dose) monitoring is done to identify employee groups exposed to noise at or above 82 dB(A) time weighted average (TWA) for 8 hour shift or its equivalent for any other period of shift, in order to include such employees under hearing conservation.

Personal exposure monitoring should be carried out on representative sample of employees working in areas with noise level of 80 dB(A) or more, or carrying out tasks exposing them to noise level of 80 dB(A) or more to determine noise dose. Personal exposure monitoring should be done using noise dosimeter, covering their entire shift period. Dosimeter should be capable of integrating all continuous, intermittent, and impulse sound levels from 80 dB(A) to 130 dB(A) must be used when measuring exposure for evaluating against hearing conservation criteria. Dosimeters should be calibrated before and after a survey has been made according to calibration procedure of the instrument manufacturer.

3.3.0 Hearing Conservation Program

It is designed to protect hearing of employees even of those exposed to significant noise levels. Employees exposed to noise at "Action Level" or above must be included in Hearing Conservation Program. Action level is 50% of Allowable Daily Dose or above which is equal to 8-hour time weighted average of 82 dB (A). Action level for duration of shift other than 8-hour can be derived from Appendix 4-1 Kuwait EPA. Elements of Hearing Conservation include the following, and these are also shown in Appendix A.

3.3.1 Audiometric Testing: Employees' ability to hear sound at different frequencies is recorded in a quiet booth using equipment called Audiometer, and the record is called audiogram. Audiometric testing is categorized and conducted as follows:

Baseline audiometric testing: It is the first audiogram of the employee. It provides a reference audiogram for an employee against which his/ her future audiograms are compared. Employers must provide baseline audiograms to their employees as part of Pre-employment examination or before initial assignment to an area or job with noise level at or above 80 dB(A) but not later than 6 months after initial assignment. Personnel undergoing audiometric test should be instructed to avoid exposure to noise for 14 hours prior to taking the test.

Annual Audiometric testing (AAT): Annual audiometric testing is done every year for employees who are individually or as a group exposed to noise at "Action Level" or above. Action level is 50% of Allowable Daily Dose which is equal to 8-hour time weighted average of of 82 dB (A). Employees' exposures to noise must be determined using dosimetry, as mentioned

under item 3.2.3. If dosimetry is used for shift lengths other than eight hours, appropriate adjustment to exposure to sound pressure level TWA must be made according to duration of exposure to determine eligibility for AAT.

Industrial Hygienist should send the initial request for the first annual audiogram of the concerned employee/ employee group along with the most recent TWA exposure of employee or employee's group to noise, to the concerned Medical Service Provider, with a copy to Superintendent of the concerned Division. Industrial Hygienist must record and communicate the most recent TWA exposure of employee or employee's group to noise to the concerned Medical Service Provider from time to time. Medical Service Provider must continue to provide annual audiometric tests to employees who continue to be exposed to noise levels equal to or above 50% noise dose. Names of employees whose exposures drop below 50% noise dose or who are no longer part of the exposed group should be removed from the program.

The concerned employees should report to the Medical Service Provider for annual audiogram and avoid exposure to noise for 14 hours prior to the test. Hearing protectors can be used during the 14 hour period to achieve the desired "quiet" level. The supervising medical professional responsible for medical screening (audiogram) in a hearing conservation program (i.e., a physician, a certified audiologist, or otolaryngologist) shall either conduct audiograms or arrange audiogram by a trained technician/ nurse under his/ her immediate supervision and review audiograms as per Hearing Conservation Program. If a Standard Threshold Shift (STS) is detected, the supervising medical professional will send a written notice of STS to the affected employee, and ask the employee to do the re-test within 30 days to determine if the STS is persistent or temporary. The result of re-test audiogram shall be considered as the final annual audiogram. If a re-test is not performed, the STS identified shall be considered as "final". In determining STS, allowance can be made for the contribution of aging to the change in hearing level. The supervising professional in Medical shall notify employee diagnosed as having STS (final) within 21 days of the final determination using a notification form. A copy of notification form shall also be sent to the employee's Superintendent/ Team Leader, and Industrial Hygienist.

Periodic Audiometric testing (PAT): All personnel, including those excluded from AAT group, shall periodically receive audiometric testing with their periodic medical examinations. Frequency of such testing should be the same as periodic medical examination. PAT serves the following purposes: (a) Detect individuals especially susceptible to hearing loss caused by industrial noise. Noise-sensitive individuals may develop hearing threshold shift as a result of noise exposure below 85 dB(A) TWA, and if identified, must use hearing protection at 80 dB(A) and above. (b) Serve as potential control data for epidemiological studies of the effectiveness of a hearing conservation program. (c) Serve as a wellness/prevention checkpoint around hearing and all noise exposures. Not-work related noise exposure should be documented.

Additional testing should be conducted to the below mentioned categories of personnel at the following intervals:

- Before and after military service.
- At the direction of the supervising medial professional whenever severe or unexplained medical hearing loss is observed.
- At the end of employment if there has been no audiogram in the last six months.

3.3.2 Hearing Protection Devices (HPD)

The use of HPD is established based on the noise level, the length of the employee's scheduled shift, and whether or not the employee has experienced a STS.

Posting and use of Hearing Protection Devices

Employees must wear HPD if they enter an area with noise level 80 dB (A) or more, or perform a task in which noise level of 80 dB (A) or more is generated. Areas with noise levels 80 dB (A) or greater should be demarcated and boundaries of these areas should be clearly marked (e.g., with a blue line, blue dots, a chain with an instruction tag, or other method), and posted with Hearing Protection Required Sign. HPD must be used by every person required to enter or work in the posted area, including any visitor and a person who has a standard threshold shift. Noise sensitive individuals, may develop hearing threshold shift as a result of exposure to noise below 85 dB (A) TWA, if identified, must use hearing protection at 80 dB (A) and above. These persons should wear hearing protection devices as long as they are in the posted area.

Management must make hearing protection devices available without cost to personnel who work in areas with noise levels at or above 80 dB (A) or perform jobs which generate noise levels at or above 80 dB(A), or who visit such areas.

Tools and portable equipment requiring the use of hearing protection must be identified (i.e, Hearing Protection Required Sign with the safe distance to the noisy device). If used temporary hearing zones must be established.

Hearing protection attenuation

Hearing protection devices must attenuate the noise exposures as mentioned in Appendix C.

Hearing protector selection and fit

Hearing protection devices can be separated into three broad categories:

- Ear plugs, which are placed into the ear canal to form a seal. These are of two types. (a) Foam ear plugs: are generally made of soft foam. They are compressed before insertion into the ear canal, where they expand to fill in the canal and block sound waves from entering. They are easy to wear and one size fits almost every one. (b) Pre-molded plugs: are made of flexible plastic. They fit into the ear canal like foam ear plugs, but do not expand to different ear shapes. Therefore, the proper size of plugs needs to be selected for each ear to ensure good fit. Ear plugs call for more skill and attention during wearing than ear muffs.

- Earmuffs, consist of molded ear cups that seal over and around the ears and are held in place with a head band. One size fits most people. Nevertheless, earmuffs should be evaluated for fit when initially issued, since no one model fits all users. Instructions for ear muff usage must be provided when these are issued, since proper placement is critical to help prevent acoustical leaks. Persons should be instructed to place their pinnae fully within the earmuff cuffs. Long hair, sideburns, caps, jewelry, and temple bars of eye glasses can reduce noise attenuation. Typically, eyeglasses degrade earmuff attenuation by 3 to 7 dB. The effect can be minimized with low, closer fitting temples. Although earmuffs are easy to put on and take off, they are bulky. Earmuffs are good for intermittent exposures due to the ease with which they can be donned and removed, and they may be suitable when earplugs are contraindicated.

- Semi-aural devices are held against the ear canal entrance with a headband to provide an acoustic seal at that point. Because they are quick to insert and remove, they are ideal for intermittent use. However they provide less protection than ear plugs and are not recommended for continuous, long-term wear.

As with all human attributes, there is a wide degree of variability in the anatomical characteristics of the human head and ear. This wide range in anthropometric data should be accounted for when protectors are selected for particular individuals. Obviously, no one device is the correct choice for all concerned. Required use of other PPE should be considered as well.

Hearing protector devices (HPD) are only effective when they fit properly and worn correctly, and consistently. The following factors are important in determining workers acceptance of hearing protectors and the likelihood that workers will wear them consistently:

- Belief that HPD will be effective in preventing hearing loss
- Availability
- Can be worn correctly and easily
- Comfortable
- Belief that HPD will not impair a worker's ability to hear important sounds
- Compatibility with other PPE.

New users of HPD should be trained in selection, use, fit and care of HPD. Industrial Hygienist or other Occupational Health Resource like Safety Engineer or Audiologist should evaluate fit of ear plugs for new users, and re-train employees with a confirmed STS, to correctly select and wear Hearing Protectors and evaluate proper fit.

After proper training, personnel must be given the opportunity to choose their hearing protection from a suitable selection provided by the employer. Reasonable requests should be honored if an individual chooses an acceptable protector not included in the selection.

Care and cleaning of hearing protection devices

Earmuffs and reusable earplugs must be kept clean and replaced when they are dirty or defective. Reusable earplugs should be washed with soap and water and stored in a clean, sealable box or bag. Earmuffs must be wiped periodically and stored in a clean location. The plastic on earmuffs can stiffen over time; the earmuffs must be replaced when this occurs.

3.3.3 Personnel Training

All new employees should receive training in Hearing Conservation and selection, fit and care of hearing protectors, as part of EH&S Induction Training.

Employees exposed to noise at "Action Level" (which is 50% of Allowable Daily Dose or exposure to noise at an 8-hour TWA of 82 dBA) or above must be included in Hearing Conservation Program. They must be trained in the proper use of hearing protection devices that have been fitted by trained personnel and must use protection routinely. Everyone in Hearing Conservation Program must receive annual training. The training must cover, at a minimum, the following:

- The effects of noise on hearing.
- The purpose of hearing protection devices.
- The advantages, disadvantages, and noise attenuation provided by various types of hearing protection devices.

- Instructions on how to select, fit, use, and care for hearing protection devices.
- The purpose of audiometric testing and an explanation of the test procedures.

The contract owner must ensure that any contractor whose work entails creation of or exposure to noise exceeding 82 dB(A) receives appropriate training including the requirements to establish temporary hearing protection zones, to comply with regulations. The key personnel of the contractor shall be nominated to Hearing Conservation Training conducted by JO and they shall in turn conduct training for their employees.

Only an individual who is trained and skilled in the use of acoustic measuring instrumentation must make noise measurements. As a minimum, training should include classroom instruction and field measurements.

3.3.4 Noise exposure control methods

Noise levels must be maintained below 85 dB(A) in industrial work environment whenever feasible, without regard to the use of hearing protection. Where these levels are exceeded, exposures must be controlled using the program elements of a hearing conservation program.

Hierarchy of noise control methods

The following is the hierarchy of control methods for noise in the order of preference:

- **Engineering controls** - This method should be considered in all situations and implemented where feasible
  - Source controls
  - Enclosure of noise source
  - Segregation of employees from noise source

This emphasizes the economic importance of early consideration of noise controls. New equipment should have noise levels of 85 dB (A) or less.

- **Hearing protection devices** - The use of hearing protection devices is essential and acceptable while engineering controls are being investigated, developed, and implemented or where such controls are not feasible, or cannot reduce the noise level to below 85 dB(A), and where exposure to noise is infrequent. For the necessary training refer to item 3.3.3.
- **Administrative or exposure (dose) control** – Administrative controls often involve reducing exposure duration through job rotation or scheduling to control the overall dose. Administrative controls must not be used in lieu of feasible engineering controls or hearing protection devices for areas/jobs that are demarcated as high noise.

Feasibility studies for engineering controls

When personal noise exposure for the shift involved exceeds the Occupational Exposure Limits (e.g., 8-hour shift at 85 dB (A)), technological and economical engineering feasibility studies to reduce noise exposure must be conducted and documented.

Engineering control at the source is the first consideration. Control of workplace noise by original equipment design or modification should be investigated. This includes purchasing new, low-noise-level equipment for initial installations or as a replacement for existing equipment. If source control is not cost effective, the next step is to investigate the feasibility of retrofit engineering controls.

Implementation of controls

Technologically and economically feasible engineering controls must be implemented according to a documented compliance plan schedule. Follow-up on the effectiveness of noise control implementation must be surveyed and documented.

3.3.5 Reporting and Investigating Standard Threshold Shift and Noise Induced Hearing Loss

All confirmed work-related Standard Threshold and Noise Induced Hearing Loss cases should be reported and investigated following "JO-SOP-609: Incident Investigation and Reporting Procedure". The supervising medical professional who is responsible for medical screening in a hearing conservation program (i.e., a physician, a certified audiologist, or otolaryngologist) shall notify work-related Standard Threshold and Noise Induced Hearing Loss cases to the concerned JO employee with a copy to the employee's Superintendent, and Industrial Hygienist. JO Supervisor shall report work-related Standard Threshold case/ Noise Induced Hearing Loss case to employee's Superintendent as per"JOSOP-609: Incident Investigation and Reporting Procedure", and a team consisting of JO Supervisor and JO Industrial Hygienist shall investigate the incident and submit report to EH&S Superintendent. The investigation team shall make appropriate recommendations including re-training of the employee in Hearing Conservation and re-fitting hearing protectors. The action items shall be documented and tracked for compliance.

Other causes of occupational hearing loss from acute exposures, which may or may not be accompanied by a standard threshold shift (e.g., loss that is secondary to baro-trauma or acoustic trauma), must also be investigated and reported according to "JOSOP-609: Incident Investigation and Reporting Procedure".

3.4.0 Contractor Hearing Conservation Program: This SOP is applicable to all JO contractors who carry out work within JO operational control. Contract owner must ensure that contractor/ subcontractor must follow all the requirements given in the SOP and summarized below:

- Comply with Noise Exposure Limits given by K-EPA as mentioned under item 3.1.0.
- Measure noise levels in work areas and offices under contractors' responsibility as mentioned under item 3.2.1
- Measure personal exposure of representative employees, working in areas with noise level 80 dB (A) or carrying out tasks that expose them to noise level 80 dB(A) as mentioned under item 3.2.3, and identify employees who should be under Hearing Conservation Program.
- Whenever feasible, noise level of equipment used by contractor should be reduced and maintained below 85 dB (A). Tools and portable equipment requiring the use of hearing protectors must be identified, and if used temporary hearing zone/s must be established.
- Audiometric testing: Arrange and ensure baseline audiometric testing of all employees, annual audiometric testing of employees under Hearing Conservation Program, and periodic audiometric testing of employees not under hearing conservation program, and reporting of audiograms as mentioned under item 3.3.1
- Training: Contract owner must ensure that Safety Engineer of contractor and key contractor employees receive training in Hearing Conservation and selection, fit and care of hearing protectors provided by JO. Contractor safety engineer/ contractor supervisor shall provide orientation on requirements of Hearing Conservation Program and basic level training in selection, use and care of hearing protectors to all employees at the start of the contract and new employees. Contractor safety engineers trained in Hearing Conservation shall provide advance

level annual training to employees under Hearing Conservation Program. The content of training should be similar to the training offered by JO to its employees, mentioned under item 3.3.3.

Only an individual who is trained and skilled in the use of acoustic measuring instrumentation must make noise measurements. As a minimum, training should include classroom instruction and field measurements.

- Hearing Protectors: Contractors must provide hearing protectors and ensure employees correctly wear them when they enter an area with noise level 80 dB(A) or more, or perform a task which can expose them to noise level of 80dB(A) or more. For details refer to item 3.3.2
- Record keeping: The contract owner must ensure that contractors are maintaining records as mentioned under item 8.2
- Reporting of Standard Threshold shift and Noise Induced Hearing Loss: The contract owners should ensure that contractors report incidents of Standard Threshold Shift and Noise Induced Hearing Loss and the same are investigated as mentioned under item 3.3.5

4.0 Roles and Responsibilities

For the purposes of this JOSOP, EH&S resources include all persons who are responsible for administering the hearing conservation and noise control program.

4.1 EH&S resources

JO-EHS Superintendent is designated as owner of this JOSOP. He will ensure elements of the SOP are implemented as designed. JO-Industrial Hygienist shall coordinate and lead implementation of hearing conservation and noise control program, including fence line noise. He will provide subject matter expertise, contact regulating bodies and legal department to seek information on regulations that may affect the hearing conservation and noise control program and inform management of these changes to facilitate improvements in the hearing conservation program. EH&S resources are responsible for:

- Helping ensure that appropriate training is developed and made available to all personnel identified to receive training.
- Determining when and where hearing protectors shall be used on the site.
- Specifying types of hearing protection devices that shall be considered by the site as options for the types of noise involved.
- Auditing for compliance.

4.2 Line management

Line management in divisions has the responsibility to implement this SOP. Line management must help to ensure that:

- The elements of the Hearing Conservation (HCP) are completed, e.g., training, audiometric testing, etc. Personnel use appropriate hearing protector devices (HPDs).
- Areas where hearing protectors must be used are posted.
- Proper hearing protectors are available and used where needed.
- Equipment and tools requiring the use of hearing protection are identified and marked.
- Engineering noise controls are put in place and maintained according to the hierarchy of control.
- Feasibility studies for engineering controls are conducted, documented, and measures implemented according to the plan.
- Work relationship is investigated if abnormal audiograms are found.

- The overall effectiveness of the hearing conservation program is assessed and documented.

4.3 Medical Resources

Medical is responsible for:

- Providing audiometric testing component of this standard.
- Identifying the medical supervising professional who must be responsible for reviewing and identifying problem audiograms.
- Implementing the requirements for medical screening of employees in a hearing conservation program.

4.4 Concerned personnel

All concerned personnel must help to ensure that:

- EH&S resources and line management are made aware of changes in noise levels of existing equipment.
- EH&S resources and line management are made aware of the purchase, hire, or acquisition of equipment with noise-producing potential.
- They use hearing protection devices (HPDs) properly when specified and apply requested noise control techniques.

Responsibilities assigned are summarized in chart (Appendix C)

5.0 Training and Communication requirements

Each division of JO must be familiar with this document in order to understand the legal requirements to conduct its business.

Training is the responsibility of management of each operation. In the event where clarification is needed, questions should be addressed to JO EH&S Division.

Appropriate training on management systems and noise control program must be provided to line management, medical personnel, and EH&S professionals. Personnel's training is covered under item 3.3.3

6.0 References

- KPC HSE Standard 41: Noise Control and Management.
- Kuwait EPA Regulations Implemented under Law No. 21 of 1995 as amended by Law No. 16 of 1996 Regarding Environmental Requirements and Standards in the State of Kuwait.
- Kuwait Ministerial Resolution No. 17 of 1973 on Occupational and Industrial Diseases as well as any pertinent diseases caused thereby. The Minister of Social Affairs and Labor.
- Kuwait Private Sector Labor Law No. 38 of 1964
- Occupational Hygiene Operational Excellence Process Feb 2010
- Noise monitoring in Chevron Guidance for Exposure Assessment, Prevention and Control
- Chevron Hearing Conservation Program
- List of Hearing Protectors and Attenuation Data: HEW Publication No.76-120, 1975, pp 21-37.
- Occupational Safety and Health Administration (OSHA) 29 CFR 1910.95. Occupational Noise Exposure.
- National Institute of Occupational Health and Safety (NIOSH): A practical guide to preventing Hearing Loss 96-110.

7.0 Other Joint Operations Guidance Documents

- Managing Safe Work
- Contractor Health, Environment and Safety Management
- Risk Management
- Fitness for Duty
- Management of Change –Facilities (MOC)

8.0 Management Systems

8.1 Support resources

JO EH&S is available to assist with implementation of this JOSOP.

8.2 Record Keeping and Document control

Records must be retained as detailed below. Records must be stored and maintained in such a way that they are retrievable and protected against damage, deterioration or loss.

Fence-line noise level surveys are environmental records. They must be retained for 40 years. Noise-level surveys must be kept for 40 years if they are being used to estimate personnel noise exposure (i.e., dose). Noise survey data must be retained only for three years if valid noise dosimetry data are available. Noise-dosimetry constitutes exposure records and audiometry constitutes hearing ability records and they must be retained permanently.

Wherever possible, records should be maintained by means other than paper.

8.3 Audit Requirements:

Hearing conservation program and noise surveys must be audited as a part of JO first party audits and KPC second-party audit system.

8.4 Standard renewal process

- JOSOP shall be reviewed/ endorsed by JO Operational Excellence Leadership Team (OELT) and approved by the General Manager.
- The latest approved version of this JOSOP shall be maintained on JO Intranet.
- If an employee does not have access to the JO Intranet, the supervisor is responsible for providing a hard copy of the latest revision of this document upon request by the employee.
- This document will be reviewed and revised every 3 years from the date of issue, or earlier if work conditions or regulatory requirements change.
- JOSOP validity can be extended for another term if work conditions or regulatory requirements have not changed within the validity period. The JOSOP shall be endorsed on the cover page.

8.5 Deviation process

Deviation from this document requirement must be authorized by the General Manager JO after consultation with Superintendent EH&S division and legal department, and after obtaining no objection from KPC OH Committee. Deviations must be documented, and the documentation must include the relevant facts supporting the deviation decision. Deviation authorization must be reviewed periodically and no less frequently than every 3 years.

Document Control Information

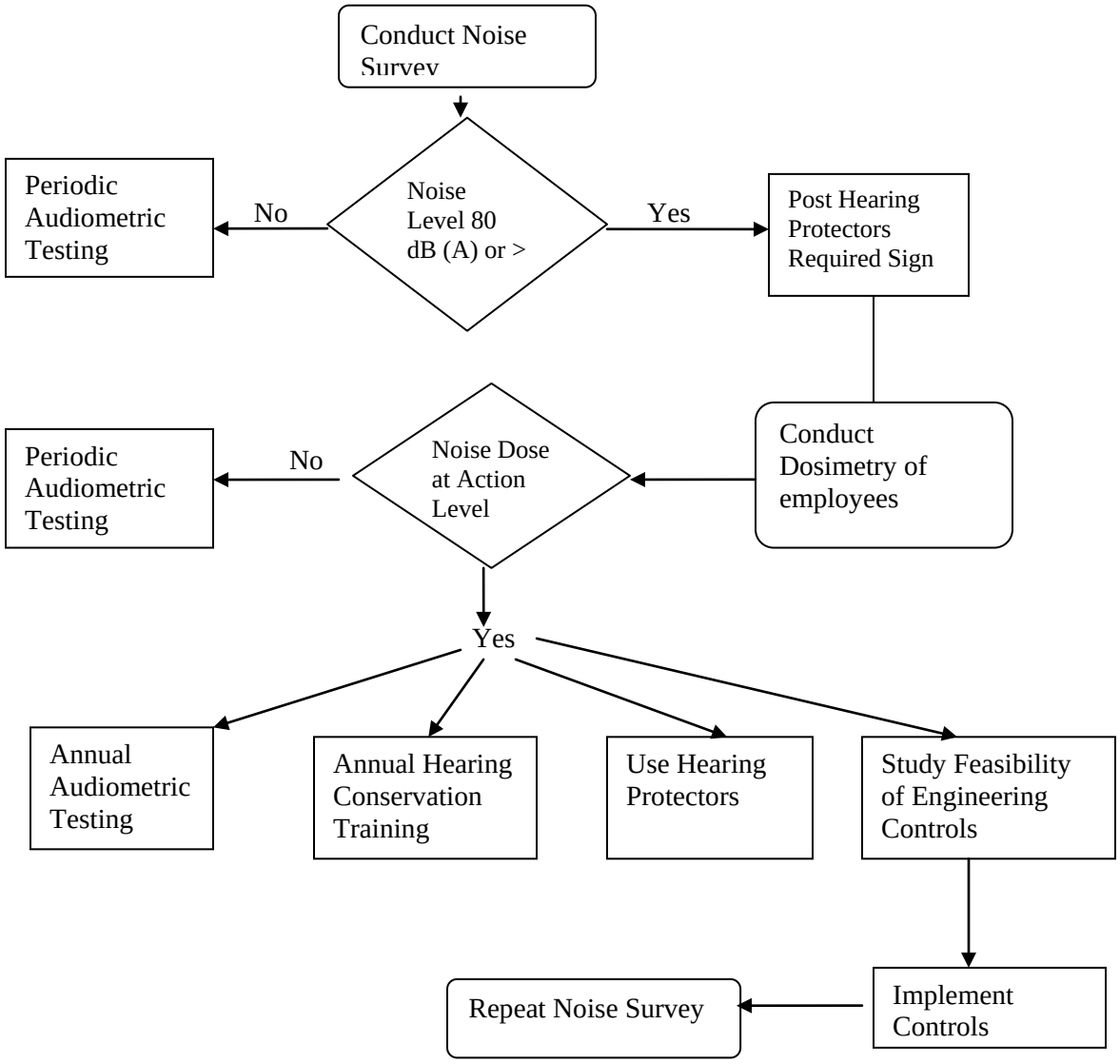
Description	JO-Common	JO-Owner
Approval Date	01 May 2012	EH&S
Next Revision Due	01 May 2015	
Control Number	1.0	

Table 1: Document History

Version Number	Date	Notes
1.0	01 May 2012	Initial Release

Appendix A. Hearing Conservation Program Administration Chart

The decisions are based on Exposure limit of 85 dB (A) (8-hour TWA) and Action Level of 82 dB (A) (8-hour TWA)



Appendix B
Hearing Protection Attenuation

Hearing protection devices must attenuate the noise exposures in which they are used to at least 80 dB(A) (TWA) for 8-hour work shifts. For 10 - hour shifts, the hearing protection devices must attenuate to at least 83dB (A). For 12-hour shifts, the hearing protection devices must attenuate to at least 82dB(A). See Table 3.

Hearing Protectors must carry Noise Reduction Rating (NRR) on their package label. NRR is a single number estimate of the reduction of noise at the ear provided by Hearing protectors when worn correctly under laboratory test conditions with a known C- weighted noise level. NRR provides a theoretical estimate of the protection that should be met or exceeded by 98 percent of the users of a given device. Due to the discrepancy between how hearing protectors fit in the testing laboratory and how users wear hearing protectors in the real world, the Occupational Safety and Health Administration (OSHA) and the National Institute for Occupational Safety and Health (NIOSH) have developed de-rating formulas to reduce the effective NRR. The method described below is a simplification of NIOSH method number 2.

While exposures to noise at work are measured and evaluated on "A"-weighting scale, NRR of hearing protectors is determined under test conditions on "C" weighting scale. Hence 7 dB is subtracted from the labeled NRR to change from C to A weighting scale and provide an estimate of the A-weighted noise level under the hearing protector, as recommended by NIOSH and mandated by the U.S. EPA.

OSHA applies the 7 dB adjustment (deduction) to NRR for changing it from C to A weighting scale first, and then de-rates the remainder by 50% for all hearing protectors to account for decrease in hearing protection provided by hearing protectors under real work conditions. For all types of hearing protection, OSHA's derating factor is 50%. For example, a protector with 33-dB attenuation would have this derating: Derated NRR = (33 – 7)/2

NIOSH has proposed a different method for derating based upon the type of protector. For earmuffs, the NRR should be derated by 25%, for slow-recovery foam earplugs the derating is 50% for all other protection, the derating is 70%. NIOSH applies the C-A spectral compensation differently than OSHA. Where OSHA subtracts the 7-dB factor first and derates the result, NIOSH derates the NRR first and then compensates for the C-A difference. For example, to find the derated NRR for an earmuff by using the NIOSH derating system, the following equation would be used: Derated NRR = (Original NRR x (1-.25)) – 7

Table 3. Hearing Protection Attenuation

	Required NRR (NRR – 7 dB) for			
Noise Exposure dB(A) (TWA)	8-hour shift	10-hour shift	12-hour shift	16-hour shift
85	15[a]	15	15	15
90	15	15	15	17
95	17	19	20	22

100	22	24	25	27
105*	27	29	30	32
110*	32	34	35	37

[a] This is the minimum noise reduction rating recommended. An additional safety factor of -5 dB may be prudent.
*Personnel should not be routinely exposed to levels in excess of 100 dB(A) TWA.

In cases where the noise exposure reaches or exceeds 100 dB(A) TWA, double protection (i.e., ear plugs under earmuffs) must be used, unless it can be shown that single protection provides adequate attenuation as described above. The attenuation provided by double protection is calculated by adding 6 dB to the higher of the noise reduction ratings for the earplugs and the earmuffs. Again, if the noise spectrum is broadband (i.e., the noise is even across the octave from 500 to 8,000 Hz) or primarily low frequency (found mainly at 500, 1,000, and 2,000 Hz), 7 dB is subtracted from the combined noise reduction rating.

If the noise spectrum is primarily high frequency, a viable alternative to double protection may be custom-moulded protectors. Custom-moulded protectors, e.g. otoplastics, are those that are manufactured by a fabrication company from impressions taken of the person's ears. Because of the exact fit afforded by these devices, personnel acceptance and effective usage tend to be very high compared to either pre-moulded or expanding-foam earplugs.

Hearing protectors should not attenuate to more than 15 dB above the required noise reduction rating listed in Table 3. In cases where the individual using the protector has a hearing loss exceeding 50 dB average at 500, 1,000, and 2,000 Hz and/or at 3,000, 4,000, and 6,000 Hz, the impact of using an hearing protection devices upon his or her ability to communicate should be considered in light of the essential job functions performed.

Appendix C
Responsibilities Chart

S. No	Activity	Superintendent - EH&S	Contract Owner	Superintendent/ Team Leader Area/ Division	Medical - HCP	Employees
1	Administer this SOP and Elements of Hearing Conservation Program	X				
2	Conduct Noise level surveys in units, building and fence line	X	X	X		
3	Conduct Personal Exposure Monitoring and notify results to employees	X				
4	Ensure areas with noise levels 80 dB (A) and greater are demarcated and Hearing Protection Required sign are posted		X	X		
5	Ensure tools and equipment requiring use of hearing protectors are identified and marked	X	X	X		
6	Ensure temporary hearing zones are established for portable equipment generating noise levels 80 dB(A) and Hearing Protection Required signs are posted.		X	X		
7	Conduct feasibility study for engineering controls, document and implement measures according to plan.			X		
8	Ensure Engineering Noise Control for new equipment and remedial action for existing equipment		X	X		
9	Develop and update Hearing Protection Specifications	X				
10	Ensure Hearing Protectors are available at worksite and employees use hearing protectors as required by HCP		X	X		
11	Provide training in Hearing Conservation and selection, fit and use of hearing protectors to new employees	X	X			
12	Provide Annual training to employees under HCP	X	X			
13	Ensure training to employees is completed		X	X		
14	Send request to Medical Service Provider for annual audiometric testing for employees under HCP	X	X			
15	Provide audiometric testing, evaluate audiograms and notify Standard Threshold Shift to concerned				X	

S. No	Activity	Superintendent - EH&S	Contract Owner	Superintendent/ Team Leader Area/ Division	Medical - HCP	Employees
16	Ensure Annual audiometry of employees under HCP is completed	X	X	X	X	
17	Investigate work relationship when Standard threshold shift or Noise induced Hearing loss is reported	X	X	X		
18	Maintain records of noise surveys and dosimetry	X	X	X		
19	Maintain records of audiometry		X		X	
20	Audit for compliance	X	X	X	X	
21	Attend induction training in Hearing Conservation and selection, fit and use of hearing protectors					X
22	Employees under Hearing Conservation Program attend Annual training in Hearing Conservation and selection, fit and use of hearing protectors					X
23	Use Hearing Protectors as required by HCP					X
24	Attend audiometric testing when requested by the management/EH&S/Medical, as appropriate					X