



**AZERBAIJAN BUSINESS UNIT
(AzBU)**

Procedure for: Noise Risk Management

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1 Introduction

Document Purpose

This Safe System of Work provides the guidelines necessary for the safe management, control and reduction of noise levels in the work place so that the risk of noise induced hearing damage incurred by personnel is reduced to a level that is as low as reasonably practicable.

Document Scope

The contents of this Safe System of Work apply to all BP owned and managed sites or installations in Azerbaijan and Georgia and deals specifically with people at work and noise induced risks to hearing.

Note: This document does not deal with nuisance or disturbance noise.

Associated Procedures

In Azerbaijan and Georgia, BP has adopted the *United Kingdom Noise at Work Regulations (SI 1989/1790)*, upon which these guidelines are based. These regulations are more stringent than those normally required in Azerbaijan and Georgia but are aligned with the rest of BP globally.

2 Roles and Responsibilities

Business Unit Leader

The Business Unit Leader is responsible for:

- ensuring that the Business Unit Operates in accordance with this Safe System of Work
- appointing a competent person to the role of Hearing Conservation Co-ordinator
- ensuring that provisions for noise management are in place with third parties.
- the maintenance of comprehensive, accurate and up-to-date noise management records in accordance with this Safe System of Work
- ensuring that noise specification is included as part of any new project, modification of existing plant or purchasing of new equipment
- target setting as part of a long-term noise reduction programme.

Site Manager / OIM

The Site Manager / OIM shall be responsible for:

- Ensuring that appropriate processes are in place on the site or installation to assure compliance with relevant noise legislation and associated company procedures

Note: The principal duty in this regard is to assess personal exposure to noise and to take such actions as required where exposure to noise is above the Action Levels defined in Paragraph 3.1 of this safe System to Work

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- Ensuring that where noise assessment has shown that it is necessary, steps are taken to reduce exposure to noise as far as is reasonably practicable by means other than ear protection.

Area Authority

Area Authorities shall be responsible for:

- Ensuring that all personnel working under their control are made aware of any noise risk associated with their activities or work place and of the necessary precautions that should be taken
- Participation in noise assessments in their area of responsibility.

Hearing Conservation Co-ordinator

The Co-ordinator's role is to make the necessary arrangements as outlined within this Safe System of Work and ensure that these are fully implemented and where necessary integrated into local safe systems of work.

The Hearing Conservation Co-ordinator, who will normally be the site Medical Officer, should report to the Site Manager on all aspects of the local hearing conservation programme including progress with noise assessments, noise control, general compliance and matters for which management action may be required.

The Hearing Conservation Co-ordinator is the principal custodian for noise-related records on site, and is also responsible for:

- Arranging for noise assessments to be carried out on site
- Ensuring a local action plan is in place following recommendations arising from noise assessments
- Ensuring that a mechanism is in place for updating noise assessments
- Supporting the Engineering function in ensuring compliance with noise specifications for all new and/or modifications to plant and equipment
- Advising management on progress of actions arising from noise assessments and engineering appraisal
- Arranging for suitable local noise training/information
- Ensuring Ear Protection Zones are demarcated and that adequate supplies of technically suitable hearing protection devices are available
- Ensuring that proper records are maintained and that they are accessible to all who need to know
- Ensuring provisions are in place for programme review and audit.

Health Team Leader

The Health Team Leader is responsible for:

- Maintenance and periodic review of this procedure.
- Providing of technical support, guidance and advice as requested by BUs and Resource Groups on all aspects of hearing conservation
- Provision of sound level surveys or noise dosimetry if it is required.
- Provision of audiometry services as part of an ongoing occupational health programme.

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Contractors

Contractors shall be responsible for:

- co-operating with BP in the preparation of a noise control study for any new plant or modifications to an existing facility in line with BP noise specifications
- co-operating with BP to ensure that, in accordance with this procedure, suitable noise control arrangements are in place, wherever necessary, prior to commencing activities
- providing audiometry screening, where appropriate, for their own employees.

Equipment Suppliers and Vendors

Companies supplying equipment shall be responsible for:

- designing and constructing of machinery so that it meets appropriate legislative requirements and BP noise specifications
- providing noise emission information associated with their supplied products.

3 Assessing Noise risk

Noise Criteria

At predefined noise levels known as **action levels**, specific measures must be taken to control and/or reduce personnel exposure to noise (see *Appendix B*). The action levels given below are related to 8-hour shift periods but equivalent values for 12-hour shifts are shown in brackets. The peak action level is based on the highest pressure reached by an instantaneous sound pressure level for any single event.

- **First Action Level** - a daily personal noise exposure of 85 dB(A) for 8 hrs (83 dB(A) 12 hrs)
- **Second Action Level** - a daily personal noise exposure or of 90 dB(A) for 8 hrs (88 dB(A) 12 hrs)
- **Peak Action Level** - means a level of peak sound pressure of 200 pascals (140 dB re 20 uPa)

These levels can be calculated or measured directly using suitable instruments and may be expressed as the daily total personal exposure to noise at work, taking into account the average levels of noise in the working areas and the time spent in those areas, but taking no account of any ear protectors worn.

Noise Assessment Requirements

Noise assessments:

- are required for all regular and foreseeable jobs within the Business Unit
- are used to identify job functions that are likely to exceed normally safe limits of noise exposure as defined in *Paragraph 3.1*
- shall be carried out by a competent person.

This Safe System of Work outlines the two mechanisms, used in conjunction with the **Noise Exposure Management System**, employed to ensure that these noise assessment requirements are met. These mechanisms are:

- baseline surveys combined with time and motion analysis
- verification by sample dosimetry surveys.

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Noise Exposure Management System

To collate the information required to determine baseline noise exposure levels or dosage rates, information is gathered on:

- the occupancy times of various personnel groups in each site area
- the noise levels in each area.

A study is then undertaken using the spreadsheet in the Noise Exposure Management System.

The Noise Exposure Management System consists of a number of linked spreadsheets, which take noise data from a basic noise survey, and work pattern information obtained from supervisors, to produce the noise dose levels for personnel.

In addition to providing noise exposure calculations Noise Exposure Management System can also provide the following information:

- which job functions are most affected by noise
- where do they get their noise exposure from
- which are the most significant areas in terms of overall staff noise exposure
- how many people do these areas affect
- what is the effect of hearing protection
- what happens when noise levels or shift patterns are changed.

Once a baseline Noise Exposure Management System has been established, the ownership and responsibility for its management shall lie with the Business Unit.

Noise assessments are repeated at two yearly intervals or whenever there is reason to doubt their validity, e.g., changes in work patterns, introduction of new machinery/processes, etc.

Note: The noise assessments shall be carried out by a competent person who is capable of bringing together enough information about noise exposures to enable decisions to be made to comply with the regulations and advising on whether additional specialist support is required.

For BP operational sites in Azerbaijan and Georgia, the competent person will be the Medic (visiting Doctor on pipeline sites). Additional information can be obtained from the Occupational Health Team.

Noise Measurement

Site Noise Level Surveys

Site noise level surveys shall be carried out in all manned work areas that are normally accessible. The measurements should be carried out by a competent and trained person and involve the use of an integrating sound level meter capable of recording overall dB(A) and where appropriate peak pressure and octave band noise levels. Readings should be marked on site plot plans which can then be cross-referenced with the Noise Exposure Management System spreadsheet.

Site noise level surveys should be carried out during routine plant operation with main equipment items running at steady loads. Equipment operating and daily production rates should be recorded. Where appropriate, noise measurement of portable or hand held power tools should also be made.

Noise Exposure for Mobile Personnel

Where a person is highly mobile and daily personal exposure levels are difficult to ascertain, noise dosimetry can be used as a means of fine-tuning of the Noise Exposure Management System and providing verification of the predicted noise exposures.

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Noise Measuring Equipment

Sound level meters, dosimeters or calibrators should meet applicable European standards. Dosimeters have no type number but should be certified as intrinsically safe. All equipment shall be calibrated against a certified standard every two years (including standard noise sources).

4 Controlling Noise Risk

Where employees are exposed to noise levels at or above the Second or Peak Action Levels there is a specific requirement to reduce exposure, and the risks from that exposure, to levels that are as low as reasonably practicable. In particular, this should be achieved wherever possible, by means other than the provision of personal ear protectors.

There are three principal areas where this could be achieved:

- noise reduction at source (*4.1 Area Noise Levels*)
- reduction of time spent in noisy areas (*4.2 Personnel Work Patterns*)
- purchasing policy, i.e. quieter equipment (*4.3 Equipment Noise Limitation*).

Area Noise Levels

Investigations Using the Noise Exposure Management System

The possibility to reduce area noise levels should be investigated using the Noise Exposure Management System to:

- identify those areas making the greatest overall contribution to noise exposure on the site
- estimate the reductions in exposure and risk that may result from any suggested corrective actions.

The information and decisions resulting from such investigations should be documented.

Note: For technical reviews of noise data, specialist assistance from a noise consultant is likely to be required. The Occupational Health Department can assist in sourcing external consultants for this purpose.

Methods for Limiting Area Noise Emissions

Methods of limiting noise generation include:

- design of workplaces for low noise emission
- substitution of quieter process or machine
- engineering control (damping, isolation, silencers, maintenance, etc)
- enclosure, screens, barriers and noise refuges.

Site Managers and OIMs should ensure that any measures or equipment introduced for the purpose of reducing noise exposure are properly used and that their effectiveness is subject to regular and routine maintenance.

Personnel Work Patterns

Modifying work practices can reduce noise exposure. Where there is flexibility in planning work, there are a number of ways of achieving such reductions, including:

- use of worker rotation to limit total exposure over a shift
- exclusion of all non essential personnel
- switching off noise source when not in use

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- avoid using hearing protection areas as access routes.

Any proposed changes to work patterns can be modelled using the Noise Exposure Management System to predict likely noise reduction on personal dose rates.

Equipment Noise Limitation

A principal and cost-effective long-term measure in reducing noise at work is a low noise equipment purchasing policy. The introduction of quieter machinery to the workplace can:

- reduce the risk of hearing damage
- assist in meeting legal duties to reduce workplace noise
- reduce the need for expensive retrofitting of additional noise control measures
- improve communications and create a better working environment
- reduce stress and improve morale
- reduce environmental or nuisance noise.

General Work Areas

The noise limit target for individual equipment items operating in general work areas is 83 dB(A) average sound pressure level at 1 metre. This target shall be attained by using sound standards, procedures and management systems for the design, procurement, construction and start-up of BP owned and managed facilities in Azerbaijan and Georgia. This noise level coincides with the First Action Level for 12-hour shifts, and is considered to be compatible with the elimination of hearing protection devices.

Note: This noise limit is regarded as the maximum acceptable level and where noise levels exceed this limit suppliers will be required to offer noise control treatment and state the lowest noise levels achievable.

Relief Valves and Flare

Special limits shall be set for relief valves and vents which operate occasionally. Noise from relief valves should never exceed the 140 dB Peak Action Level.

The flare should be sited such that the noise at positions normally accessible to personnel, at the maximum emergency flow, should not exceed 115 dB(A).

Ear Protection Zones

Ear protectors shall be worn where personnel are exposed at the First Action Level or 83 dB(A).

All work areas, within which employee noise exposure may exceed the First Action or Peak Action Levels, shall be designated EAR PROTECTION ZONES.

As far as reasonably practicable, ear protection zones will be marked with signs at all entrances, and at appropriate places within the zones as necessary. All personnel entering these zones shall wear ear defenders.

Where it is not reasonably practicable to mark ear protection zones then adequate alternative arrangements should be made to ensure employees are aware that protection should be worn. These arrangements include attaching warning signs to tools and the provision of written instructions for particular tasks (Permit to Work).

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Hearing Protection Devices

Note: The use of ear protection is a last resort to control noise exposure and should only be considered where it is not reasonably practicable to control exposure by other means.

Availability

On all sites and installations, personal ear protectors shall be made available to employees where their noise exposure is liable to exceed the First Action Level or the Peak Action Level. The ear protection provided shall comply with the requirements of Safe System of Work *UNIF-HSE-PRO-156 Personal Protective Equipment*. In particular, ear protectors must be capable of reducing noise levels to below the Second Action Level and will be chosen on the basis of their acoustic performance and user acceptability.

Manufacturer's Information

Manufacturers must provide information on the noise reduction which can be expected from their ear protectors, this information along with details of the noise spectra from noise measurements on site should be evaluated by a competent person to assure that the correct level of attenuation is provided.

Occupational Health Department

The Occupational Health Department will also advise with regard to the suitability of hearing protection used within BP in Azerbaijan and Georgia.

Information, Instruction and Training

Where employees are likely to be exposed to noise levels above those provided in *Paragraph 3.1 Noise Criteria* in this Safe System of Work, shall be provided with information, instruction and training on:

- risk of damage to hearing
- steps to minimise that risk
- how to obtain and use ear protectors
- how to report defects
- employees' duties under the United Kingdom Noise at Work Regulations (SI 1989/1790) Regulations.

Local arrangements may include the use of leaflets, posters, video and computer based training material.

5 Monitoring noise risk

Audit and Review

Noise assessment and noise management actions shall be documented and resultant recommendations placed within a suitable action tracking system. Such noise management records will require periodic review to track action items, including:

- new noise sources addressed
- noise assessments up-dated
- training schedules met
- noise exposure reduction measures actioned and verified.

Targets for continuous improvement shall be established and a process shall exist for regular self-assessment.

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Audiometry

Audiometry is a means of measuring and monitoring an employee's hearing during employment and also a means of measuring the effectiveness of hearing conservation, and identifying areas where conservation may be deficient.

Audiometry is initially performed on all new starts whose duties take them offshore, or require them to work in high noise areas. For new starts a second baseline audiogram will be repeated within 6 months of starting. Thereafter BP policy is to retest at 2 yearly intervals, unless as specified by the Company's Medical Advisor.

All audiogram records are kept by BP Azerbaijan/Georgia Occupational Health Department and/or Medical Service Providers (Azerbaijan AEA International SOS, MediClub).

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APPENDIX A – DEFINITIONS

dB(A):	Unit of sound level and noise exposure. A-weighting (A) of the audible frequencies is designed to compensate for the sensitivity of the ear. The ear is more sensitive to noise at frequencies in the middle of the audible range than it is to either very high or low frequencies.
Dosimetry:	Technique utilising the use of a personal noise instrument (dosimeter) to continuously measure noise exposure during normal daily work operation.
Lep,d	A measure of the average noise energy a person is exposed to during a working day, this is directly related to the risk of hearing damage.
NEMS:	Noise exposure management system developed by Acoustic Technology Limited.

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APPENDIX B – NOISE ACTION LEVELS AND CONTROL MEASURES

Action required where daily personal exposure to noise (lep,d) is likely to be :	<1 st Action level	1 st Action level	2 nd Action level
EMPLOYER'S DUTIES			
General Duty To Reduce Risk Risk of hearing damage to be reduced to the lowest level reasonably practicable (Reg. 6)	X	X	X
Assessment of Noise Exposure Noise assessments to be made by a Competent Person (Reg.4) Record of assessments to be kept until a new one is made (Reg.5)	X X	X X	X X
Noise Reduction Reduce exposure to noise as far as is reasonably practicable by means other than ear protectors. (Reg.7)			X
Provision of Information to Workers Provide adequate information, instruction and training about risks to hearing, what employers should do to minimise risk, how they can obtain ear protectors if they are exposed and their obligations under Reg. 11 Mark ear protection zones with notices, so far as reasonably practicable (Reg. 9)		X *	X X
Ear Protectors Ensure so far as is practicable that protectors are : <ul style="list-style-type: none"> • Provided for employees who ask for them (Reg. 8(1)) • provided to exposed (Reg.8(2)) • maintained & repaired (Reg. 10(1)(b)) • Used by exposed (Reg.10(1)(a)) Ensure so far as reasonably practicable that all who go into marked ear protection zone use ear protectors. (Reg.9(1)(b))		X * X *	X X X (1)
Maintenance and Use of Equipment Ensure so far as is practicable that : <ul style="list-style-type: none"> • all equipment provided under the Regs is used (Reg.10(1)(a)) • ensure all equipment is maintained (Reg.10(1)(b)) 		X X	X
EMPLOYEES DUTIES			
Use of Equipment So far as practicable : <ul style="list-style-type: none"> • use ear protectors (Reg.10(2)) • use any other protective equipment (Reg.10(2)) • report any defects discovered to his/her employer (Reg.10(2)) 		* X X	X X X
MACHINE MAKER'S AND SUPPLIERS DUTIES			
Provision of Information Provide information on the noise likely to be generated (Reg.12)		X	X

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Appendix C – Noise Assessment Flowchart

