



RISK MANAGEMENT GUIDE

OCCUPATIONAL NOISE

How Do We Hear?

Sound waves striking the eardrum set up vibrations in the middle ear. These are picked up by the inner ear (cochlea) where they are translated into nerve impulses from the ear to the brain.

Humans can hear noise in frequencies 20 Hz to 20,000 Hz, but we have particular sensitivity in the range 1,000 to 4,000 Hz which is the range of frequencies covering ordinary speech.

If hearing is damaged through extensive exposure to noise the higher frequency vocal sounds, around 4,000 Hz, will probably not be heard. This is why speech becomes distorted as hearing loss sets in.

To reflect this, when noise is measured at work, emphasis or weighting is given to those frequencies that have most effect on the human ear. Hence noise meters having an "A Weighted Decibel Scale" or dBA are used.

Undesirable Effects of Noise

The effects of noise on workers have been recognised for many years. The main problems can be summarised as:-

Acute or Short Term Medical

Temporary threshold shift i.e. hearing loss due to auditory nerve fatigue which returns to normal levels after a period of hours following the original exposure.

Tinnitus - ringing in the ears.

Acute acoustic trauma i.e. sudden damage to the eardrum or cochlea caused by very loud noises and which is often reversible.

Long Term Medical

Permanent threshold shift, otherwise known as noise induced hearing loss. This is irreversible damage to the inner ear and is difficult to differentiate from Presbycusis which is the natural deafening due to old age.

Tinnitus - ringing in the ears.

Diplacusis - uneven hearing between the ears which makes understanding difficult.

Social

- Interference with rest or sleep
- Causes annoyance
- Hinders communication
- Causes increased fatigue.

Statutory Requirements

The requirements are contained in the Noise at Work Regulations 2005 which came into force on 6th April 2006.

The main provisions are:

- assessment of noise levels where workers are likely to be exposed to risks
- elimination of risks at source or reduction to a minimum
- appropriate health surveillance where the risk assessment indicates a risk to health
- weekly averaging of exposure in duly justified circumstances.

The regulations set out three exposure levels at which action is to be taken i.e.

Lower exposure level - where the daily or weekly exposure exceeds 80 dBA, not taking into account the use of hearing protection, the following actions have to be taken

- hearing protectors must be made available
- information and training must be provided and
- audiometric testing made available where there is a risk to health.

Upper exposure level - where the daily or weekly exposure exceeds 85 dBA, not taking into account the use of hearing protection, the following actions have to be taken

- establish and implement a programme of technical and/or organisational measures aimed at reducing the exposure to noise
- mark, delimit and restrict access to noisy areas
- mandatory use of hearing protectors
- provide hearing checks by a doctor (audiometry).

Peak action level - whereby, taking into account the use of hearing protection, the levels of noise exposure must not exceed:

- 87 dBA, daily or weekly, or
- A sound pressure of 140dB.

Assessment of Exposure

If the peak action levels are likely to be exceeded then a noise assessment by a competent person is required. This should identify the work areas/activities that are above the lower, upper or peak action levels.

The assessment must be reviewed if the validity of the original assessment is in doubt or there has been significant change in working practices and their noise levels.

Records of the assessment are to be held until a subsequent assessment or until all employees covered by that assessment leave. It is advisable to keep records for longer than this to provide information on long-term trends or with regard to subsequent claims.

Reduction of Risk of Hearing Damage

There is an overall duty to reduce the risk of hearing damage to the lowest extent that is reasonably practicable.

When the peak or 85 dBA action levels are exceeded, there is a duty to reduce the exposure, so far as is reasonably practicable, other than by the use of protective equipment.

In other words personal protective equipment (PPE) should be regarded as the last rather than first resort. The risk should either be eliminated or reduced, as far as is reasonably practicable, by technical and/or organisational means i.e.

Eliminating exposure

- Using alternative processes.
- Purchasing raw material prepared elsewhere.

Reducing exposure

- enclosing machinery
- enclosing people
- fitting anti-vibration mountings
- non reverberant enclosure/building
- improving mechanical maintenance
- fewer people/reducing exposure periods.

When an employee is likely to be exposed to noise levels between 80 and 85 dBA the employer is to take reasonable steps to provide hearing protection if the employee so requests.

Hearing Protection Zones

Areas identified by the Risk Assessment as being above the upper exposure level should be designated as hearing protection zones. These must be

- demarcated and identified by means of appropriate signs and
- employees must wear personal protectors whilst they are in that zone.

Maintenance and Use of Equipment

The employer is to take reasonable steps to ensure that protective measures (other than ear protection) are properly used and maintained in efficient working order and repair.

There is a general duty on employees to use the personal ear protectors and protective measures provided by the employer and to report any defect in them.

Information for Employees

Every employer must provide adequate information, instruction and training to employees exposed at or above the exposure levels. This should include

- The risk of damage that exposure may cause;
- The steps the employee can take to minimise the risk;
- The steps the employee should take to obtain hearing protection;
- The employee's obligations.

Duties of Manufacturers etc

A person who supplies an article for use at work has a duty to provide adequate information on the possible noise levels generated if they are likely to expose any employee to a level at or above 80dBA or the peak action level.

Health Surveillance - Audiometry

Employees who are regularly exposed to noise levels of 85dBA or higher must be subject to health surveillance that includes audiometric testing.

Where exposure is between 80dBA and 85dBA, or where employees are only occasionally exposed above the upper exposure level, health surveillance will only be required if information comes to light that an individual may be particularly sensitive to noise-induced hearing loss.

Audiometry is useful as it can be used

- To measure the hearing capability of any new employees
- To monitor the effectiveness of preventive measures such as personal hearing protection when these are used in areas of high noise
- To raise awareness among workers of the hazards of noise.

Further Information

Further information on how to address your Noise at Work risks can be found in the following Health and Safety Executive (HSE) publications

- L108 Controlling Noise at Work
- HSG138 Sound Solutions
- INDG362 Noise at Work
- INDG363 Protect Your Hearing or Lose it (Guidance for employees)
- PM56 Noise From Pneumatic Systems.

The HSE have a specific web - page dedicated to Noise which is located at

<http://www.hse.gov.uk/noise/index.htm>

HSE priced and free publications are available by mail order from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA Tel: 01787 881165 Fax: 01787 313995. Details may also be obtained from the HSE Books home page on the World Wide Web at

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