

# Noise at work

*Over 2 million UK workers are at risk from excessive noise (HSE estimate). The dangers are clear in industries such as mining, tunnelling, quarrying, heavy engineering, iron and steel production, textiles, and driving heavy vehicles. But noise is also a hazard for white-collar workers such as office workers and teachers, and in the service and entertainment industry.*

## New EU standards

Since 1989, UK noise regulation has been based on European standards, watered down as much as the UK could manage.

Under a 2003 European Union directive, these laws must be replaced by the start of 2006 with upgraded regulations. The leisure industry, which tried for exemption from the improved standards, will have until the end of 2007 to comply.

The new directive

- ▲ reduces action levels by 5 decibels, or 75 per cent
  - ▲ emphasises that substitution and control come before protective equipment
  - ▲ introduces an exposure limit
- Where new equipment or work systems are brought in during 2003–2005, it will make sense to meet the new standards. Workplaces should be planning now to comply with the new requirements since they may call for major new mechanical noise control measures.

## Noise damage

Permanent hearing damage is first noticeable around frequencies of 4000 Hz (high-pitched speech) and gradually spreads to other frequencies. Both ears are affected roughly equally. Dizziness or

loss of balance, and ringing in the ears, can also occur.

Noise can be a stressor causing loss of concentration, fatigue, tension, and irritability. There is suspicion that it can cause raised blood pressure and hormonal and immune system problems. There is some evidence that noise exposure during pregnancy may lead to low birth weight or damage a baby's hearing.

Vibration, exposure to some chemicals and drugs can reinforce the damaging effect of noise. Some drugs (including aspirin) and other chemicals can affect hearing directly.

## Factors in noise damage

**Intensity** (loudness or level) results from the sound pressure of vibrations. The sound pressure is measured in A-weighted decibels (dBA). A-weighting adjusts for the human ear's varying sensitivity to different frequencies. The decibel scale is logarithmic, so every 3 dBA doubles the noise and every 10 dBA means a ten-fold increase: 90 dBA is 10 times louder than 80 dBA, and 100 dBA is 100 times louder. Speech is about 50 dBA. The noise level in factories averages 80–100 dBA. Jet engines run at about 130–140 dBA.

**Frequency** The human ear can hear frequencies between 16 Hertz (Hz) and 20,000 Hz. Speech frequencies are 250–4000 Hz. High frequency sounds are the more dangerous.

**Duration** Longer exposure increases the damage.

**Nature** Noise can be stable, fluctuating or intermittent. Impulsive noise (such as hammering) is particularly harmful.

**Damage** begins at or before 80dBA. After exposure to 85dBA for 8 hours a day for 15 years, 5 per cent of workers will show hearing loss. The same length exposure to 90dBA will damage 14 per cent of workers; and to 95 dBA, 24 per cent of workers.

## The law

The Noise at Work Regulations 1989 say employers must reduce the risk of hearing damage to the lowest level reasonably practicable and maintain all equipment. The Regulations set two action levels, at 85 and 90 dBA.

### First Action Level: 85 dBA (2006: 80dBA)

Employers must:

- ▲ assess noise exposure from processes and maintain records
- ▲ provide information, instruction and training for workers
- ▲ use noise reduction equipment supplied by manufacturers
- ▲ advise workers that they are entitled to ear protectors
- ▲ provide these to workers who ask for them and ensure they are maintained and repaired.

Workers are not obliged to use ear protectors at this level but must use other protective equipment supplied and report defects in equipment. Manufacturers and suppliers of equipment must supply information on the noise likely to be generated.

### Second Action Level: 90 dBA (2006: 85 dBA)

Employers must:

- ▲ reduce exposure to noise by means other than ear protectors
- ▲ mark ear protection zones
- ▲ provide ear protectors to all exposed persons and ensure they are used in ear protection zones.

Employees must use ear protectors which have been provided.

## Exposure Limit

Currently there is no exposure limit. From 2006 the exposure limit will be 87dBA. This will be the maximum permissible exposure measured inside any protective equipment.

### Holes in the regulations

The current regulations have serious flaws:

- ▲ the 85dBA Action Level places very weak obligations on employers, despite clear evidence that 85 dBA causes permanent damage
- ▲ they omit the Directive's requirement for a programme of technical and work organisation measures to reduce exposure
- ▲ they frequently dilute requirements with the phrase 'as far as reasonably practicable'

The first two points are improved in the 2006 standards, which clearly state that protective equipment is a last resort and prioritise substitution and control measures.

Since April 1999 there has been only one successful prosecution under the Regulations, a Lancashire farmer who was fined £240.

### Union action: substitution and control

Union representatives should develop an action programme aiming for substitution and control of noisy machines and processes:

- ▲ replace the machine or process by a quieter one
- ▲ reduce the noise by fitting silencers, dampening vibration, improving lubrication, minimising metal to metal contact
- ▲ maintain bearings, gears, lubrication
- ▲ block the noise path or insulate the machine or building
- ▲ move the machine or process away from people or vice versa

- ▲ limit the length of exposure
- ▲ reduce the number of people exposed
- ▲ ensure new machinery is properly designed to reduce noise – set a limit of 75 dBA for new machines

Ear protectors should only be used as a temporary measure until noise is removed, reduced or isolated, because:

- ▲ they interfere with communication and isolate the wearer
- ▲ they place the onus for safety on the worker rather than the employer
- ▲ they can lead to complacency about the noise problem
- ▲ they can easily be damaged or deteriorate
- ▲ expertise is needed in their correct choice, use and maintenance

### Using surveys

Union representatives should demand that their management surveys all suspect areas and provides the results to the

union. Surveys should be carried out in typical conditions, with all noisy processes in operation and with as few people present as possible as the human body is a great noise absorber.

It's not hard to do a simple noise survey if you need to demonstrate the hazard. You can use a hand held noise survey meter, preferably an integrating type which can show average levels, or a personal dosimeter. Depending on the situation, you may want to survey:

- ▲ daily personal exposure (intensity and duration)
- ▲ average noise intensity
- ▲ peak intensity.

Instruments must be checked for correct measurement every time they are used, and they should come with a simple calibrator which does this. They must meet British Standards 6402 (dosimeters), 5969 (peak levels), BS 6698 (integrating) or 5969 (simple sound level).

## Find out more

**Official guidance: *Reducing noise at work: guidance on the Noise at Work Regulations 1989*.** HSE, 1998. HSE series no L108. ISBN 0717615111. £9.75

**Official advice: *Noise at work: advice for employers*.** HSE series no INDG362. There are also HSE leaflets on noise in construction, engineering, power presses, woodworking machinery, industrial saws, paper mills, punch presses. Single copies free from HSE Books 01787-881165; many can be downloaded from [www.hsebooks.co.uk](http://www.hsebooks.co.uk).

**EU directive 2003/10/EC on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise).** Official Journal of the EU no L42, 15 February 2003, p38-44; online at [europa.eu.int](http://europa.eu.int).

London Hazards Centre Factsheets are available online at [www.lhc.org.uk](http://www.lhc.org.uk)  
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