

Safety Code of Practice 42

1<sup>st</sup> Edition, May 2013

# CONTROLLING THE RISKS FROM NOISE AT WORK



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# 1 SUMMARY

**The Safety Code of Practice sets out the arrangements for controlling noise at work for staff and in some cases, students. It covers exposure to loud noise that may potentially cause short or long term damage to hearing, and noisy work environments where noise may cause other safety issues, such as the inability to hear alarms. It does not address 'nuisance' noise. The University has a duty to reduce noise to levels as low as reasonably practicable, and to protect the health, and specifically hearing, of staff and students.**

Schools and Services are required to carry out an assessment of the risk from noise, where they suspect noise levels may be at or close to the action exposure values set out in the Noise at Work Regulations 2005. The lower action exposure value is 80 dB, averaged over an 8 hour working day. There is also a peak action level of 137 dB.

The flow chart at Figure 1 overleaf summarises the steps that should be followed to minimise and control risks from exposure to noise. It should be noted that other measures to reduce noise take precedence over wearing hearing protection.

Symptoms/indications of excessive noise include:

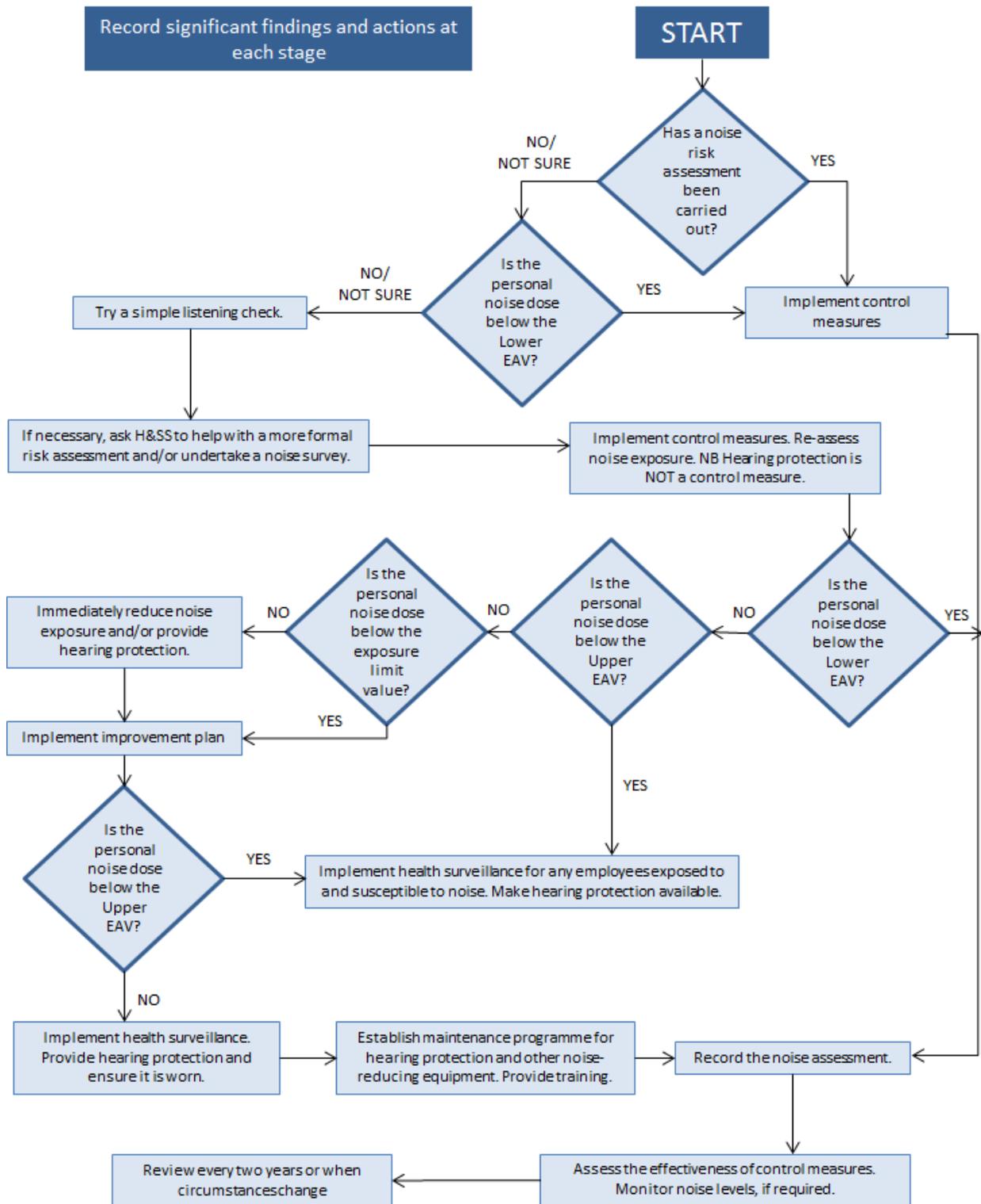
- Temporary deafness after exposure to loud noise
- Ringing in the ears
- It is not possible to have a normal conversation with someone two metres away
- Very loud impact or explosive noise

Any of these indicators should prompt further investigation.

Noise exposure is a combination of the loudness of the noise, the duration and worker's access and sensitivity to the noise. There will therefore be occasions when an individual is exposed to relatively loud noise, but the risk to hearing is reduced because the exposure is of short duration and infrequent. This can only be confirmed by a full noise assessment.

Health & Safety Services will assist with noise risk assessments, and will undertake noise surveys on request when there is concern or uncertainty about noise levels. They will also advise on appropriate noise reduction measures and controls, on any requirement for health surveillance, and provide training for managers and staff.

Figure 1 Summary of noise risk assessment process



## 2 SCOPE

**This Safety Code of Practice sets out what managers and staff have to do to reduce the risk of long-term damage to hearing from exposure to excessive noise at their place of work.**

This Code does not cover the environmental aspects of noise and noise pollution or the adverse effects on wellbeing which can arise from 'nuisance' noise.

## 3 INTRODUCTION

Noise at work can cause hearing loss that can be temporary or permanent. People often experience temporary deafness after leaving a noisy place. Although hearing recovers within a few hours, this should not be ignored. It is a sign that if an individual continues to be exposed to noise, their hearing could be permanently damaged. Permanent hearing damage can also be caused immediately by sudden, extremely loud, explosive noises.

The damage is disabling as it can stop people being able to understand speech, keep up with conversations or use the telephone. People may develop tinnitus (ringing, whistling, buzzing or humming in the ears). In the workplace, noise at work can interfere with communications and make warnings harder to hear. It can also reduce people's awareness of their surroundings. These issues can lead to safety risks – putting people at risk of injury or death.

The Control of Noise at Work Regulations 2005 imposes duties on the University to protect employees who may be exposed to noise. The University also has a duty to ensure that the health of students is not adversely affected by excessive noise arising from their course of study.

Staff and students may be exposed to high levels of noise in the following situations:

Staff	Students
Mechanical workshops and plant rooms	Fine Art projects
Use of noisy handheld power tools	Engineering workshops
Use of grounds or farming equipment e.g. lawnmowers, hedge trimmers, chain saws, agricultural tractors	NB Social activities are excluded from the requirements of this Code and the Noise at Work Regulations.
Exposure to large numbers of animals in farming	
Loud music e.g. working in or with an orchestra, managing a disco, working in a campus bar with entertainment	

## 4 RESPONSIBILITIES

### 4.1 Duties on Heads of School/Services

Heads of Schools/Services are responsible for ensuring that arrangements are in place to eliminate or reduce the risk from noise at work where possible. If noise cannot be eliminated, effective control measures must be in place, so far as reasonably practicable. These must be communicated to all persons who may be exposed.

## 4.2 Line managers/Supervisors

Line Managers/Supervisors must ensure that:

- They have sufficient knowledge and understanding to recognise when noise could be an issue in their area, and to seek competent assistance
- Noise risks are assessed and action is taken to reduce exposure where necessary
- Action is taken to ensure that legal limits on noise exposure are not exceeded
- The correct type of hearing protection is issued where noise exposure cannot be reduced by other methods, and is maintained and worn correctly
- Staff and students (where relevant) are provided with information and training on the health risks from excessive noise, and the control measures that they must follow
- Noise factors (and hand-arm vibration) are taken into account when hiring or purchasing new equipment
- Noise levels and associated vibration issues are considered when installing or relocating equipment or activities
- Equipment is maintained to ensure that it continues to operate correctly and so far as possible does not become noisier over time
- Hearing protection zones are defined and signed where necessary
- Health surveillance is arranged where there is a risk to health/hearing, as identified in local risk assessments
- The risk assessment is reviewed and updated when circumstances change.

## 4.3 Health & Safety Services

Health & Safety Services are responsible for:

- Assisting managers in assessing the risks from noise
- Conducting noise surveys on request, or arranging for competent external third parties to undertake surveys
- Advising on appropriate noise reduction measures, including the selection of hearing protection where this is appropriate
- Advising on referrals to Occupational Health, either for health surveillance or in response to reports of symptoms
- Providing training on the risks of noise to health, and control measures, for managers and staff

## 4.4 Occupational Health

The University Occupational Health provider (Health Management Ltd) is responsible for:

- Organising and carrying out appropriate health surveillance programmes and associated advice/training to individuals within the health surveillance programme
- Notifying line managers/supervisors and Health & Safety Services of health surveillance results, and any resulting recommendations.

Further information on the health surveillance programme is given in section 7.

## 4.5 Staff

Staff are responsible for:

- Complying with the control measures

- Using all equipment in accordance with instructions and training
- Wearing hearing protection in accordance with instructions
- Reporting to their manager/supervisor immediately if they experience any symptoms that would be associated with noise at work
- Co-operating with the health surveillance programme
- Reporting any defects or problems with equipment or hearing protection.

## 5 NOISE LEVELS

### 5.1 How noise is measured

Noise is measured in decibels, dB, normally with a frequency weighting added, 'A' weighting, to take account of the way the human ear responds to sounds of different frequencies. When measuring peak noise, a different 'C' weighting is applied.

The decibel scale used to measure noise is logarithmic, an increase in 3 dB equates to a doubling of sound. An increase from 80 to 85 dB is almost a fourfold increase in sound level.

### 5.2 Action levels and exposure limits

The Noise at Work Regulations 2005 require employers to take specific action when noise reaches certain action values, shown in Table 1 overleaf.

The action levels relate to:

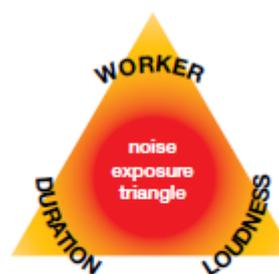
- the levels of exposure that employees are exposed to over a working day or week; and
- the maximum noise (peak sound pressure) to which employees are exposed in a working day.

Table 1 Exposure action values

<b>Exposure action values</b>		
<p>The Noise Regulations define ‘exposure action values’ – levels of noise exposure which, if exceeded, require the employer to take specific action. <u>This excludes any attenuation from hearing protectors.</u> There are ‘lower’ and ‘upper’ action values. Managers need to compare their estimated noise exposure with the action values to know what specific actions are required in addition to the general duty to reduce risks from noise.</p>		
	Lower exposure action value (decibels)	Upper exposure action value (decibels)
Daily or weekly personal noise exposure (LEP,d or LEP,w)	80 dB(A)	85 dB(A)
Peak sound pressure (LCpeak)	135 dB(C)	137 dB(C)
<b>Exposure Limit Values</b>		
<p>There are also levels of noise exposure which must not be exceeded. These are called exposure limit values. This is the <u>maximum sound exposure permitted</u> for any individual and <u>takes attenuation from hearing protection into account.</u> The exposure limit values are:</p>		
Daily or weekly noise limit value	87 dB (A)	
Peak sound pressure	140 dB (C)	

It is important to recognise that noise exposure is a combination of the loudness of the noise, the duration and worker’s access and sensitivity to the noise. There will therefore be occasions when an individual is exposed to relatively loud noise, but the risk to hearing is reduced because the exposure is of short duration and infrequent.

It is also the case that some frequencies can be more damaging than others



Remove any element and overexposure to noise is prevented

Reduce loudness or duration and exposure is reduced

2.

## 6 ASSESSING THE RISK FROM NOISE IN THE WORKPLACE

### 6.1 Do you have a noise problem?

Action may need to be taken if any of the following apply:

- The noise is intrusive – for example, as noisy as a busy road, a vacuum cleaner, or a crowded restaurant – or worse than intrusive, for most of the working day. If noise is intrusive but normal conversation is possible, likely noise level is approximately 80 dB (A).
- People have to raise their voices to carry out a normal conversation when about 2 m apart, for at least part of the day. If they have to shout, the likely noise level is approximately 85 dB (A). If they have to shout when the person is 1 metre away then the noise will be approximately 90dB (A).
- Employees use noisy powered tools or machinery for more than half an hour each day. A tractor, power mower or hand drills are likely to generate at least 90 dB (A).
- There are noises due to impacts (such as hammering, pneumatic impact tools etc), explosive sources such as cartridge-operated tools or detonators, or guns. Sounds peaking of over 140 dB (C) are liable to cause immediate and lasting hearing damage rather than accumulating over time.

Situations where safety issues need to be considered in relation to noise include where:

- Warning sounds are used to avoid or alert to dangerous situations
- Working practices rely on verbal communications which may not be heard
- There is work around mobile machinery or traffic
- The building fire alarm cannot be heard above the ambient noise level in the workplace.

### 6.2 Noise risk assessment – what to do to control exposure to noise at work

#### Gather data and make a preliminary estimate of risk

You should identify the areas and work activities where there may be a risk from noise, and who is likely to be affected. You should consider and take into account:

- Whether or not there are indications of noise being a problem – see section 5.1.
- Information about noise levels provided with work equipment, tools etc. Consult equipment handbooks, manufacturer's web sites, equipment suppliers etc.
- Asking members of staff if they have any symptoms associated with work-related noise levels.
- Results from any previous noise surveys or published data for equivalent workplaces.
- How work may vary from one day to the next.
- **How long staff are exposed to the noisy environment.** For example an individual working in an area where the noise level is 80 dB (A) would have a personal exposure of 80 dB (A) if they working in that environment for 8 hours. However, working in an area where the noise level was 85 dB (A) for 2 hours per day would give a personal exposure of 80 dB (A).

When making a reliable, representative estimate of daily personal noise exposure (or 'dose' – a combination of 'how loud' and 'how long for') do not make any allowance for the wearing of personal hearing protection.

### **Make an accurate measurement of representative noise**

Ask Health & Safety Services to conduct a noise survey of the workplace, or representative tasks, to confirm noise levels.

Then confirm your estimate of noise exposure, taking account of the noise levels, duration of exposure, and frequency of exposure. Health & Safety Services will assist with this.

The estimate of the daily personal noise exposure ( $L_{ep,d}$ ) of employees at risk should be made and compared with the exposure action and limit values. The estimates of noise levels must be reliable enough to be able to assess whether any exposure action levels are likely to be exceeded.

A formal risk assessment must be made and recorded where noise levels exceed the lower exposure action value (80 dB (A)).

Where employees are likely to be exposed at or above the upper exposure action values, action must be taken to reduce noise exposure with a planned programme of noise control.

#### **Guidance:**

Undertaking an accurate and useful noise survey is complex and staff must be trained and competent to do so.

The Health and Safety Executive (HSE) have produced noise exposure calculators which can help to work out daily noise exposure, weekly noise exposures, and estimate the performance of hearing protection. This resource can be accessed via the Health and Safety Executive website at:

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

### **Identify all persons who may be at risk**

You should make a list of employees who use noisy machinery or equipment and which jobs they do. Also list those who have outlined concerns or stated that they have symptoms of hearing loss.

Ensure that you consider others who may be affected by the work, including students if they may be exposed to noise at or above the action values.

### **Action to reduce noise exposure**

Regardless of whether or not exposure action values or limit values are reached, action should be taken to reduce risks from noise to as low as reasonably practicable. These controls should include consideration of the following:

- doing the work another way which then eliminates or reduces exposure to noise
- specifying/replacing tools/equipment/vehicles with alternatives which are quieter
- shielding or enclosure (of either a piece of equipment or the operator)
- ensuring all equipment is properly maintained
- reducing time exposed to noise e.g. regular breaks, recovery periods, job rotation etc. every halving of the time spent in a noisy area will reduce noise exposure by 3 dB
- design and lay out the workplace to minimise noise exposure, keeping noisy machinery out of areas where people spend most of their time
- using absorptive materials within the building to reduce reflected sound, e.g. open cell foam or mineral wool
- providing hearing protection.

Noise reduction measures can be a balance of reducing noise at source, and reducing people's exposure to it by distance, shielding and reduced duration of exposure.

## 6.3 Hearing protection

Hearing protection should not be used as an alternative to controlling noise by technical and organisational means. Hearing protection should be issued to employees:

- where extra protection is needed above what has been achieved using noise control
- as a temporary measure when other methods of controlling noise are being developed or installed.

Staff must be provided with hearing protection when:

- they ask for them and their noise exposure is between the lower and upper exposure action values
- their noise exposure exceeds the upper exposure action values.

Managers must ensure that employees use hearing protection fully and properly when their noise exposure exceeds the upper exposure action values.

Hearing protection must not be shared for hygiene reasons, and facilities must be made to store it in a good clean condition.

To make sure protectors are worn fully (all of the time they are needed) and properly (fitted or inserted correctly) supervision and training must be provided. Also consider the use of spot checks and audits.

### 6.3.1 Selecting suitable hearing protection

The following factors should be taken into account when selecting hearing protection:

- suitable protection factor – sufficient to eliminate risks from noise but not so much protection that wearers become isolated. Attenuation must reduce the noise to below 85 dB and preferably to around 75 dB
- suitable to provide protection from the frequencies (octave bands) of noise to which the worker will be exposed
- consider the work environment – physical activity, comfort and hygiene
- compatibility with other protective equipment, e.g. hard hats, masks and eye protection.

If Health & Safety Services have carried out a noise assessment, they will specify type of hearing protection that will be suitable.

Hearing protection must be CE-marked. It is good practice to consult staff to ensure that the hearing protection is acceptable and will therefore be worn.

Hearing protection must be maintained so that it works effectively. Factors that affect the level of protection, such as the headband tension and the condition of seals, should be checked as part of the system of maintenance. Staff have a duty to report any defects in hearing protection so that it can be repaired/replaced.

#### Guidance:

The pros and cons of different types of hearing protection are described in the HSE publication: HSG260 Noise in music and entertainment, available on HSE's web site.

## 6.4 Hearing protection zones

Area of the workplace where access is restricted and where hearing protection is compulsory must be identified and signed. This will include any areas where:

- work is going on during which particular employees must be provided with, and use, hearing protection i.e. exceeds the upper exposure action value of 85 dB (A)/137 dB (C).
- the upper exposure action values would be likely to be exceeded if staff spent
- a significant portion of the working day within them, even if access is generally infrequent, e.g. plant rooms or compressor houses.

The signage opposite should be used.

Access must be restricted unless it is necessary to carry out work.

Before entering a hearing protection zone people must put on suitable hearing protection and must wear it all the time they are within the zone. However zones should not extend any further than is necessary.

In situations where the boundaries of the zone cannot be marked, e.g. the equipment is mobile, alternative arrangements must be made to ensure that people know where or when protectors should be worn. These could include signs attached to tools or machinery, written instructions etc.



# 7 INFORMATION, INSTRUCTION AND TRAINING

## 7.1 Managers/Supervisors

Managers and supervisors who need to understand the risks associated with noise in the workplace, undertake noise risk assessments and implement hearing conservation measures should receive training in the requirements of this Code of Practice. This is available from Health & Safety Services.

## 7.2 Staff

Employees should be provided with training so that they understand the risks they may be exposed to, and what they are required to do. Where they are exposed above the lower exposure action values they must be told about:

- their likely noise exposure and the risk to hearing this creates
- how risks and exposure are controlled, including the requirements for hearing protection zones and hearing protection
- where and how to obtain hearing protection
- how to identify and report defects in noise-control equipment and hearing protection
- what their duties are under the Noise Regulations
- what they should do to minimise the risk, such as the proper way to use noise control equipment and hearing protection

- the University health surveillance arrangements.

## 8 HEALTH SURVEILLANCE REQUIREMENTS

Line Managers/Supervisors must identify staff who have been identified by risk assessment as requiring health surveillance for exposure to noise. Employees should be referred to the University Occupational Health Service.

Health surveillance is required if employees are:

- likely to be frequently exposed above the upper exposure action values
- occasionally exposed above the upper action level, or are exposed between the lower and upper action levels, AND
- they are known to be sensitive to noise e.g. from past medical history, audiometry results, or a history of noise exposure exceeding the upper action level.

The University Occupational Health Service will provide a tiered approach to health surveillance. Line managers will need to ensure that they refer any member of staff when they start in a role that will expose them to noise or those changing jobs so that a baseline can be taken. This will be followed by a programme of regular checks (usually initially annually, leading to 3 yearly checks) these may be more frequent if any problems are detected or where the risk of hearing damage is high.

All individual records will be held in confidence. Where necessary to prevent any further harm to individuals or groups of similarly exposed employees, the University will act upon the advice of the Occupational Health Physician.

Where appropriate anonymised summary results for groups of employees will be reported back to relevant managers to provide information on the effectiveness of any noise controls which are in place.

### Guidance:

Health surveillance will not normally be appropriate for students due to the fact that their noise exposure is likely to be limited and of short duration.

## 9 RISKS IN SPECIFIC WORK ENVIRONMENTS – GUIDANCE ON NOISE REDUCTION MEASURES

### 9.1 Engineering workshops and plant rooms

Departments/units with engineering workshops will require noise assessments to be completed. This will confirm the need for hearing protection to be worn when operating equipment as there is generally a need for the operator to be close to the equipment during operation.

**Guidance:**

Generally noise exposure is limited within the University setting as equipment is not used intensively. Noise reduction can be improved by good maintenance of equipment and where necessary isolating noisy equipment. Also some equipment can be adjusted or have low noise blades fitted.

Some areas, in particular plant rooms, may need to be defined as Hearing Protection Zones, where the correct hearing protection must be worn, taking account of frequency/pitch and noise levels. If the whole area is not defined as a Hearing Protection Zone, protection may be required for specific tasks in these areas. Staff must be trained in how to wear and maintain their hearing protection, and a suitable supply of disposable hearing protection should be made available at these areas.

If a work area is defined as a Hearing Protection Zone, staff must have access to a quiet area for other work (e.g. working on PCs etc.).

The location and installation of noisy machines is a specialist task and should be undertaken by a qualified engineer. They should assess:

- noise reduction/attenuation within the area
- attenuation or transfer of noise via the structure of the room/building.

## 9.2 Music and entertainment

Departments which manage music events or venues where music and entertainment takes place should refer to the HSE publication HSG260 *Noise in music and entertainment*. In order to reduce noise exposure to staff, the following actions should be considered:

- Design of the facilities to reduce the direct, reverberant and structural sound paths
- Focusing of the music
- Level setting and monitoring
- Time limits for working in noise areas
- Hearing protection (after other measures)

Level setting means controlling the volume by setting maximum levels. This is usually done by the use of limiters. This will help reduce noise breakout as part of the licensing procedure and local nuisance control.

Where noise-volume-limiting devices are used for reducing exposure to employees, the responsibility and ability to alter the maximum level should be clearly defined in the local management arrangements.

# 10 PURCHASING AND MAINTENANCE

## 10.1 New equipment

When hiring or buying equipment managers should consider noise alongside other factors (e.g. general suitability, efficiency) and compare the noise data from different machines. Installation arrangements, e.g. methods of mounting and location, and different methods of operating, should be discussed with the supplier.

When using a manufacturer's noise data there is a need to make sure that the data is representative of the way the equipment will be used. Be cautious when using manufacturers' data

other than for comparing equipment; for example, the data is likely only to be a guide to personal noise exposure as many factors affect the noise levels experienced by employees.

## 10.2 Maintenance

Equipment must be maintained so that it operates efficiently, without generating undue noise. Anything provided that is intended to control noise must be maintained so that it continues to be effective. This should be incorporated into systems for routine and reactive maintenance. The effectiveness of many noise-control measures can be significantly reduced even though the level of disrepair seems minor.

# 11 SAFETY CONSIDERATIONS

There will be occasions when loud noise may cause practical safety problems, such as the inability to hear instructions/warnings/alarms. Where this is the case, alternative arrangements must be made, such as:

- additional sounders and/or flashing visual beacons in support of fire detection and alarm systems
- switch-off devices to amplifiers used during music events, linked to the fire detection and alarm system.

Where warning sounds are used to avoid or alert to dangerous situations, they should be selected to be clearly audible in the environment in which they are used, taking account of the hearing ability of the people involved and any use of personal hearing protection.

## 12 REVIEW

Arrangements, and in particular noise risk assessments, should be reviewed every two years or when circumstances change, if sooner, or if information becomes available that indicates that control measures are not fully effective.

# 13 FURTHER ADVICE AND INFORMATION

1. Control of Noise at Work Regulations 2005. Health & Safety Executive (HSE), 2005.
2. Controlling noise at work. L108, HSE, 2005.
3. Noise at work: a brief guide to controlling the risks. INDG362 (rev 2), HSE, 2012.
4. Sound advice: Control of noise at work in music and entertainment. HSG260, HSE, 2008.

Noise exposure calculators and ready-reckoners, HSE, available on-line at <http://www.hse.gov.uk/noise/calculator.htm>.

## Appendix 1: Version control

VERSION	KEEPER	REVIEWED	APPROVED BY	APPROVAL DATE
X.X	H&S	Every four years	XXXXX	XX/XX/XX
X.X	H&S	Annually	XXXXX	XX/XX/XX