



Noise assessments in paper mills

Paper and Board Information Sheet No 1

Introduction

This information sheet has been produced by the Paper and Board Industry Advisory Committee (PABIAC) which involves representatives from the trades unions, employer's organisations and the Health and Safety Executive (HSE). The committee was formed in 1979 to advise the Commission on health and safety issues relating to the manufacture of paper and board.

The sheet will help employers and employees understand the legal duties under the Noise at Work Regulations 1989 (the Noise Regulations) to make a noise assessment. Detailed information is included in HSE's guidance *Reducing noise at work: Guidance on the Noise at Work Regulations 1989*.¹

It is the first of a series of information sheets on noise which are designed and punched to fit into the PABIAC binder, *Guide to managing health and safety in paper mills*.² The guide will build into a comprehensive reference document for the paper and board industry containing both priced and free PABIAC publications.

Regulations 4 and 5 of the Noise Regulations

Once you have identified that there is a likely noise hazard in your mill, you need to make an assessment of the risks to exposed workers. As a rough guide, noise is likely to be at hazardous levels wherever people have to shout or have difficulty being heard clearly by someone about 2 m away.

The Noise Regulations define noise action levels which determine when specific steps have to be taken. If employees are likely to be exposed to either:

- noise at or above the first action level (a daily personal noise exposure* of 85 dB(A)); or
- to the peak action level or above (a peak sound pressure of 200 pascals - for practical purposes this is equivalent to a 'C' weighted peak level of 140 dB(C));

then employers should ensure that a competent person makes a noise assessment which is adequate to meet the requirements of the Noise Regulations. The peak action level will rarely be exceeded in the paper mill environment under normal operating conditions.

* The daily personal noise exposure is a measure of the average noise energy a person is exposed to during a day.

Employers also need to ensure that an adequate record of the noise assessment is kept until a further noise assessment is made (regulation 5).

Noise survey or noise assessment?

HSE inspectors have found that there is some confusion in the paper industry between a noise survey and a noise assessment. A noise survey is typically just a record of noise levels in a noisy area. A noise assessment is more than this. Its purpose is to:

- identify those people at risk from hearing damage so that you can formulate an action plan for controlling noise exposure;
- determine the daily personal noise exposure ($L_{EP,d}$) of those who are likely to be exposed at or above the first action level in the mill. The noise assessment is incomplete without the $L_{EP,d}$ for those workers exposed above the first action level;
- identify any additional information which might be needed to comply with the Noise Regulations, such as where and what type of noise control or ear protection is appropriate throughout the mill.

Preparing a noise assessment - use of a competent person

Make sure that a competent person makes the noise assessment. Advice on what to look for in a competent person and what training they should receive is included in Part 3 of *Reducing noise at work*.¹ The level of expertise needed by the competent person will depend largely on the complexity of the situation to be assessed, but in all cases they will need to know how to:

- correctly use a sound level meter (ie a 'noise' meter) for a variety of work situations;
- analyse the measurement results and understand information provided by others, eg equipment suppliers;
- understand the Noise Regulations and know how to apply them.

Mill employees who have a basic knowledge and aptitude and who have been given appropriate training may be able to act as competent persons - see

'Organisations able to provide further advice' in this sheet. But be aware of people's limitations, for example, they may lack expertise in noise control engineering and the ability to complete the assessment 'action plan' without seeking further assistance to identify ways of reducing noise at source, eg:

- from machine manufacturers and/or suppliers on the operation of machine parts;
- on the design of noise enclosures and silencers;
- from suppliers of noise control hardware etc.

Identification of future action is an important part of the noise assessment.

Alternatively, the job of making a noise assessment may be contracted out. Instructions for contracted-out noise assessments should be specific and clear to avoid any misunderstandings as to what is required. Many mill managers have mistakenly thought that a simple noise survey undertaken by a consultant comprises a satisfactory noise assessment. The free HSE leaflet *Selecting a health and safety consultancy*³ provides useful guidance for employers.

Equipment hire

When noise assessments are to be carried out in-house by suitably trained employees, equipment hire could be a cost-effective alternative to buying a sound level meter. A benefit of hiring is the reduction in lost time and inconvenience through instrument maintenance and calibration. Some mills may also be able to borrow the necessary equipment from others in the industry.

Calculating daily personal noise exposure

A noise assessment must state employees' daily personal noise exposure ($L_{EP,d}$). Assessment can be made for groups of employees where this will adequately reflect their individual personal noise exposures (see paragraph 158 of *Reducing noise at work*).¹

Using a sound level meter, you can obtain measurements of the sound pressure level at the different locations within the mill where a person works and for the different tasks carried out during the day. These noise exposure measurements and the time spent in each place or at each task measured are called 'fractional noise exposures'. It is important that you have the correct exposure times, especially for the periods spent in the highest sound levels, even if the time is only very short.

The $L_{EP,d}$ can be determined by using either a calculator method or a chart known as a nomogram (see page 38 of *Reducing noise at work*). These methods enable 'fractional exposure values' to be calculated which are

summed to give the $L_{EP,d}$. These methods can also be used to determine the $L_{EP,d}$ where shifts last longer than 8 hours (see Table 1). Detailed information on how to calculate $L_{EP,d}$ including nomograms and further worked examples, is included in Part 4 of *Reducing noise at work*.

The fractional exposures from a series of noise sources are very important in helping to identify the relative significance of noise exposures and to help prioritise action on control measures. The greatest fractional exposure values should be addressed first in the action plan to control exposure to noise.

Table 1 Example of a noise assessment (extract only)

By: Competent person
Date:
Employee:

Task	Sample Leq dB(A)	Exposure time - Hours (12-hour shift)	Fractional exposure 'f' values
Task 1	96	3.5	1.8
Task 2	92	4.5	1
Task 3	85	3	0.12
Break	80(nominal)	1	0.01
Total f			2.94
Assessed $L_{EP,d}$			95 dB(A)

Noise assessment records

It is important that after the noise assessment you produce a proper record. The following checklist is a guide to show the type of information you should include in your noise assessment records. As a minimum, an adequate record will include details of:

- the workplaces, areas, jobs or people assessed;
- measurement locations and durations and any noise control measures being used at the time;
- the work patterns and calculations of daily exposure;
- daily personal noise exposures ($L_{EP,d}$) where they are above the first action level;
- peak noise exposure levels where they are above the peak action level;
- the sources of noise;
- any further information necessary to help comply with the reduction of noise exposure;
- the date of the assessment;

- who made the assessment.

Action plan to introduce noise control measures

Assessments are not just about measuring a problem, they need to help to identify solutions as well. The noise assessment should contain adequate information to formulate a detailed action plan for introducing noise control measures, incorporating:

- immediate actions to control noise exposure;
- future actions to reduce noise exposure, such as the treatment of machines, tools, processes or rooms; changes to work processes, patterns and locations; and the segregation of quiet and noisy tasks;
- the correct kind of ear protection to keep the noise exposure below the second action level or the peak action level of the Noise Regulations as an interim measure if there are long lead-times before noise reduction controls can be installed (regulation 8). You need to select ear protection to take account of factors including suitability in the working environment, compatibility with other safety equipment and the user, and its ability to reduce exposure to below the action level (see Part 4 of *Reducing noise at work*);
- what parts of the mill should be demarcated as 'Ear Protection Zones' where ear protection is required (regulation 9);
- how the mill will provide employees with adequate information, instruction and training about the risk to their hearing, what steps they can take to minimise that risk etc (regulation 11);
- health surveillance activities, ie audiometry;
- the name of the person responsible for carrying out the action plan;
- a date for completion of the action plan;
- a planned date for review of the noise assessment.

Taking action

Once the noise assessment has been completed, mill managers need to consider and decide what the company will do about any noise problems identified. The 'fractional exposure values' in the assessment will help in setting priorities, but there may be a range of options available. Decide on the short-, medium- and long-term action plan. Some noise solutions may need capital expenditure supported by a business case which

may need high-level approval.

Issuing ear protection should only be a short-term solution until other more effective methods of dealing with noise can be implemented, and the action plan needs to make this clear.

What do I do with my noise assessment?

Don't file it and forget it. A noise assessment is a working document and therefore should be incorporated into your company's health and safety management policy. The understanding of legal requirements, noise exposure and noise control principles acquired by managers monitoring the noise assessment process is a valuable resource which can be used to good effect in a quality management system.

Purchasing policy

Your purchasing policy should include sourcing low noise (and vibration) equipment for future capital investment. Ask suppliers to provide information about noise emission levels and consider the siting of noisy equipment. The actual noise exposures will need to be assessed when the new equipment is installed and a check made to see that suppliers have complied with their duties under the Supply of Machinery (Safety) Regulations 1992.⁴

Involve those with a good knowledge and understanding of the importance of noise control in the preparation of tender specifications, or provide suitable training for people who deal with purchasing. This would minimise the risk of bringing excessively noisy equipment onto the premises. It can be much more costly for a mill to try to make a machine quieter than it is for the manufacturer to design and build in noise control measures at the start. Further guidance on a noise purchasing policy is contained in *Keep the noise down: Advice for purchasers of workplace machinery*.⁵

Reassessment and keeping records

The noise assessment will probably need to be reviewed when you:

- install or remove machinery;
- make substantial changes in workload, work pattern or machine speeds;
- change the building structure or machine layout;
- experience machine wear or general deterioration;
- make modifications to machinery or introduce automation; and
- make changes in the noise control programme.

In addition, regular checks will be needed to confirm that noise exposure has not increased. Record-keeping is important, as this will show how personal exposure has been reduced by the action already taken, and will help you to plan further control measures.

References and further reading

- 1 *Guide to managing health and safety in paper mills* HSE Books 1997 ISBN 0 7176 1313 5
- 2 *Reducing noise at work: Guidance on the Noise at Work Regulations 1989* L108 HSE Books 1998 ISBN 0 7176 1511 1
- 3 *Selecting a health and safety consultancy* INDG133 HSE Books 1992
- 4 *Buying new machinery* INDG271 HSE Books 1998
- 5 *Keep the noise down: Advice for purchasers of workplace machinery* INDG263 HSE Books 1997
- 6 *Sound solutions: Techniques to reduce noise at work* HSG138 HSE Books 1995 ISBN 0 7176 0791 7
- 7 *Introducing the Noise at Work Regulations: A brief guide to the requirements for controlling noise at work* INDG75(rev) HSE Books 1989

While every effort has been made to ensure the accuracy of the references listed in this publication, their future availability cannot be guaranteed.

The Institute of Acoustics, 77A St Peter's Street, St. Albans, Herts AL1 3BN. Tel: 01727 848195.

The Association of Noise Consultants, 6 Trap Road, Guilden Morden, Nr Royston, Herts SG8 0JE. Tel: 01763 852958.

National Examining Board in Occupational Safety and Health, Industrial Relations Services Training, First Floor, Lincoln House, 296-302 High Holborn, London WC1V 7JH. Tel: 0207 420 3500.

British Institute of Occupational Hygienists, Suite 2, Georgian House, Great Northern Road, Derby, DE1 1LT. Tel: 01332 298087.

Regional contacts through trade associations, health and safety journals, and commercial directories.

Further information

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. Website: www.hsebooks.co.uk

HSE priced publications are also available from good booksellers.

For other enquiries ring HSE's InfoLine Tel: 08701 545500, or write to HSE's Information Centre, Broad Lane, Sheffield S3 7HQ. Website: www.hse.gov.uk

This leaflet was prepared by the Paper and Board Industry Advisory Committee and has been agreed by the Health and Safety Commission. It contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

This publication may be freely reproduced, except for advertising, endorsement or commercial purposes. The information is current at 3/00. Please acknowledge the source as HSE.

Organisations able to provide further advice