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The Consequence of Making a Noise in the Workplace:

The World Health Organization reports that Noise Induced Hearing Loss (NIHL) is the most common irreversible occupational hazard in the world and is still one of the leading occupational hazards in industrialised countries. With an estimated 2 million people in the UK exposed to harmful noise levels at work, noise exposure accounts for approximately 80% of occupational disease claims up until 1997¹.

Although cases in the UK have recently fallen with the decline in heavy industry they are being discovered in new, previously unexplored, non-industrial areas of the workforce such as call centres, education (teachers) and the entertainment industry. The RNID reports that the recent 24 hour licensing has actually created a higher risk to hearing damage for a further 568,000 people working in this sector. This worrying trend has further consequence in that social noise level in the UK has tripled since the early 1980s and as result NIHL is actually on the increase in younger people².

April 6th this year saw the Control of Noise at Work Regulations (2005) transpose into UK legislation European Directive 2003/10/EC. The Directive consolidates and repeals the existing EC Noise Directive 86/188/EEC, implemented by the Noise at Work Regulations 1989 (NAWR). This tighter EU

directive for noise in the workplace has the objective of ensuring the health and safety of workers across the European Union and avoiding the distortions of interpretation.

The action levels previously outlined in the NAWR have been replaced with exposure action values that are 5dB(A) lower than previous legislation. The lower exposure action value is now 80dB(A) and the upper exposure action value is 85dB(A). A limit value of 87dB(A) has also been introduced and constitutes the level at which no employee must be exposed (the limit value does take into the account the level of protection afforded by hearing protectors). Limit values for peak noise have also been introduced. These are C-weighted and are set at 135dB(C) and 137dB(C) with a limit peak level of 140dB(C), the equivalent to 200 Pascals.

The link between noise exposure and hearing damage is well known and internationally accepted with the effects also putting employees at higher risk for developing hypertension and ischaemic heart disease³. The HSE report that 1 million people are exposed between the new lower and upper exposure action values and good evidence suggests that prolonged exposure to noise at between 82dB(A) and 85dB(A) presents a hazard. The magnitude of the hazard rises rapidly above this level and continuous occupational exposure to 90dB(A) for 10 years would result in 5% of

employees sustaining a 30dB hearing loss and rises to 50% of employees over a working lifetime of exposure ⁴.

A further 1.1 million people are exposed to noise levels above 85dB(A) at work, with an estimated 170,000 suffering deafness, tinnitus or other ear conditions as a result ⁵. More worrying is that, of these 1.1 million employees, almost half are exposed at or above 90dB(A).

The history of NIHL in Britain is well documented. In 1908 it was understood that certain occupations, such as the manufacture of boilers, created a high rate of hearing loss and became known as 'boilermaker's ear'. 'Weaver's deafness' was the similar diagnosis in the textile industry ⁶. The UK introduced the 'Noise in Factories' Guidelines (1960), much in response to the earlier American study of industrial deafness, produced by the American Standards Association Committee in 1952, titled 'The Relations of Hearing Loss to Noise Exposure'. A year later the UK followed their 1960 publication with 'The Factories Act' and in 1963 two publications: 'The Wilson Report' and 'Noise and the Worker' introduced the Damage Risk Criterion, setting the first recommended exposure limits for noise. Following research by the National Physical Laboratory during the 1970's the effects of noise on hearing was better understood and a code of practice was introduced in 1972 and ratified 2 years later in the 'Health and Safety at Work Regulations (1974)'. This was followed later by more specific guidelines for noise with the 'Protection of Hearing at Work Regulations (1981)' and then by the NAWR (1989) which have been used for the last 16 years and will



continue to be the regulations for the music and entertainment sectors until April 2008, and for sea-going vessels until 2011 when the NAWR will finally be repealed.

However, many employers are unprepared for the new, tighter regime while employees need to be educated about their rights under the legislation. So what should employers be doing? By law, employers must assess and identify measures to limit or reduce risks from exposure to noise through a 'hierarchy of control measures' ranging from acoustic and mechanical design to hearing surveillance and protection.

The best solution is to remove the noise at source, and although the regulations support this, it is also recognised that the methods must be reasonably practicable and that not all sources of noise can be so easily managed. Where noise does exist employers should be looking for alternative processes, equipment or working methods which makes the work quieter or means that people are exposed to the noise for shorter times. Noise is a sign of wasted energy and by reducing the noise output of machinery employers can often make efficiency gains.

Redesign of the workplace or working patterns can sometimes help to achieve a reduction in levels as will the replacement, segregation or enclosure of noisy machinery. Companies should introduce low-noise purchasing policies and utilise supplier information for output levels to ensure the machinery will function as required when in situ. Regular maintenance and engineering controls that reduce metal to metal impacts by reducing drop heights or fitting damping materials to surfaces and mountings to reduce vibration and the transmission of sound. Silencers can be used to reduce noise-producing turbulence in output exhausts, compressed air sources and dust and ventilation systems. Barriers and screens can block the direct path of sound, and absorptive materials strategically placed within the building will help to prevent reflected sound.

Hearing protection is a last resort, it is very useful in controlling exposure, whilst other engineering controls can be implemented, but should not be used as a permanent first-line defence in reducing an employees exposure to noise. Any protection offered by personal earplugs or muffs relies on employees wearing them in the demarcated hearing protection zones and also fitting them correctly. Real-world protection is often considerably less than manufacturers data and removal of them for just a few minutes of an 8-hour shift will result in them becoming considerably less effective in managing a daily noise dose. An employee that uses hearing protection for only 50% of the recommended time will gain only 3dB of protection ⁷.

Information, instruction and training should be provided to employees and helps them to understand the risks that they are exposed to as well as their duties under the Noise Regulations 2005. Risk should be minimised by correctly using hearing protection, ensuring employees spend no

longer than necessary in noisy environments and use other noise-control equipment and noise-refuges correctly

Health surveillance in the form of screening audiograms must be provided to all employees who are likely to be regularly exposed above the upper exposure action value, or have other risk factors such as an existing hearing loss, or exposure to ototoxic chemicals and solvents. Audiograms should ideally be undertaken when first employed, or annually for the first two years of a hearing surveillance programme and then at three-yearly intervals.

Harmful noise exposure doesn't just occur in the workplace. There is an increasing awareness of noise in recreational activities, for example, shooting, woodworking, musicians and motorcycling. Noises at home may come from vacuum cleaners, lawn mowers, or leaf blowers. Yet recreational activities, although harmful, are not controlled by legislation and have the same potential to create levels of noise comparable to heavy industry, the only way to protect individuals is to raise awareness, use hearing protection and encourage manufacturers to develop lower noise products.

Despite the introduction of the Control of Noise at Work Regulations 2005 NIHL is not a new occupational threat. Beethoven went slowly deaf over a number of years. His music, enjoyed today as it was 200 years ago can only be fully appreciated with normal hearing, something ironically that Beethoven lost before he was fifty. Although the specific cause of his deafness is still debated, the constant exposure to musical performance may have been a significant contributory factor. By the time he composed his ninth



symphony he is reported as being almost completely deaf, suffering with tinnitus and living alone due to an inability to socialise. In a letter to his friend (and doctor) Franz Gerhard Wegler in 1801 he wrote:

"... For two years I have avoided almost all social gatherings because it is impossible for me to say to people "I am deaf". If I belonged to any other profession it would be easier, but in my profession it is a frightful state.."

1. Association of British Insurers
2. Smith, Davies, Ferguson and Lutman, *Noise & Health* 2000, 6 41 – 56
3. World Health Organisation
4. HSE: *Final Regulatory Impact Assessment of the Control of Noise at Work Regulations 2005*
5. Health and Safety Executive
6. Association of Noise Consultants, *Guidelines: Industrial Deafness*
7. HSE: *Control of Noise at Work Regulations 2005*

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