Comfort zone

Protecting plant employees with state-of-the-art equipment and clothing is both the goal and bane of plant management, as Brian Wall reports

While measures that ensure workers are properly protected from the hazards of their surroundings may well be reappraised constantly – both in terms of regulatory requirements and the detailed conditions they are likely to encounter on site – there is just no accounting for human behaviour.

No matter how expensive or leading edge personal protective equipment (PPE) might be, unless it is comfortable for each and every individual using it, the chances are such equipment may end up being discarded, even if only for short periods of time. And that means exposure to the very dangers the equipment has been designed and selected to protect them from.

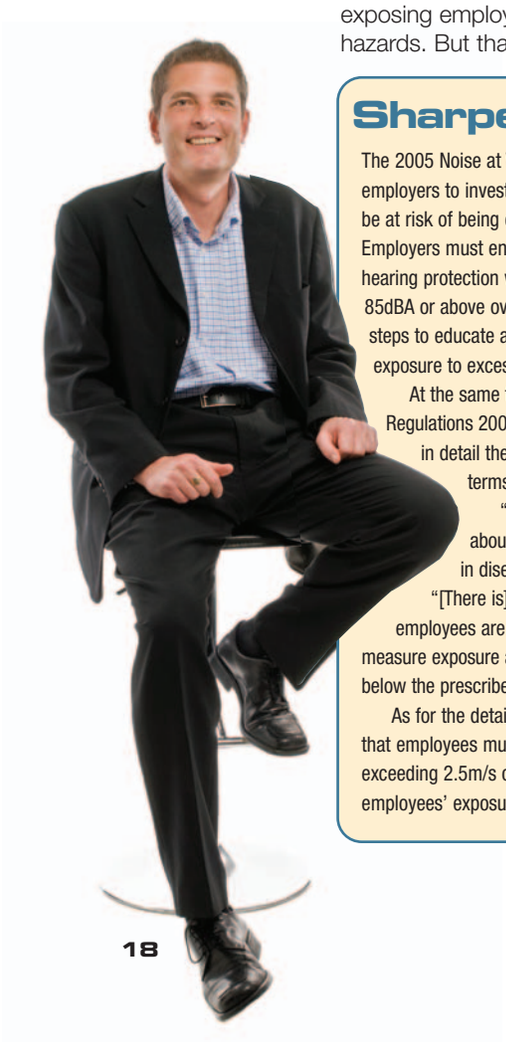
So, while PPE generally is mandated to meet accepted standards, there is another equally important issue to consider – that of comfort. Unless this factor is adequately addressed, PPE may well be jettisoned at some point on the job, exposing employees to serious safety and/or health hazards. But that leads to an obvious equipment selection problem: comfort is necessarily a highly subjective attribute, so one person's PPE comfort zone might well be entirely unacceptable to another.

We have to get this right: if the statistics are to be believed, even removing a simple FFP2 respirator for just 10% of the time – the equivalent of 48 minutes in an eight-hour shift – cuts its effective protection factor almost in half.

"Similarly, any usage level below 100% of HPE [hearing protective equipment] may significantly reduce its effectiveness," says Sarah Broadbent, of the occupational health and environmental safety group at 3M. "Simply not wearing the HPE for 30 minutes over eight hours' exposure will reduce protection to near zero."

And that brings us to another quite separate problem: wearing HPE that reduces noise levels to below 70dB(A) can leave employees dangerously isolated from their environments. There have been reports of plant personnel not only experiencing difficulties in communicating with others, but even of failing to hear important warning signals.

Below: Jim Byard: Duties imposed on employers have intensified



Sharper edge to the regulations

The 2005 Noise at Work Regulations impose duties on all employers to investigate areas of work where employees could be at risk of being exposed to excessive levels of noise. Employers must ensure they have a mandatory system of hearing protection where employees are exposed to noise at 85dBA or above over an eight-hour day. They must also take steps to educate and warn employees on the dangers of exposure to excessive noise.

At the same time, the Control of Vibration at Work Regulations 2005 were the first codified regulations to specify in detail the duties on employers and plant managers, in terms of limiting exposure to that hazard.

"Similarities with the noise regulations abound," states Jim Byard, a partner specialising in disease claims at law firm Weightmans LLP. "[There is] a duty to investigate the extent to which employees are exposed to levels of vibration, a duty to measure exposure and a duty to take steps to reduce vibration below the prescribed levels."

As for the detail, Byard explains: "The main ramifications are that employees must not be exposed to levels of vibration exceeding 2.5m/s over an eight hour day averaged weekly, or, if employees' exposure is intermittent or varies markedly from day to day, then a daily maximum exposure limit of 5m/s should not to be exceeded."

Overall, he suggests that plant managers need to consider occupational health surveillance – both for existing employees, but particularly also for new employees. "Audiograms and VWF [vibration white finger] questionnaires provide a useful benchmark both to gauge the levels of symptoms, but also to assess previous exposure in other employments, which could help in the defence of a claim for damages further down the line," comments Byard.

"Employers should not only investigate the levels of noise and vibration in their workplaces, but need to take the further step of analysing from those reports which of their workers will be affected – and then take positive steps to protect them or reduce their exposure," he warns.

And he adds: "It is also vital that levels of noise or vibration are taken into account when purchasing new plant and equipment. Plant managers should always ask themselves whether new machinery or tools will emit less noise or vibration than those presently in use. Manufacturers will be legally obliged to provide data on noise and vibration, so plant managers must be sure to obtain those documents for any new machinery."

The good news is that some of the latest HPE offers communications built in, with ear muffs having inset radios and/or electronics that automatically analyse external sounds before transmitting them to the ear. "Bluetooth can also be built into HPE, offering wireless communication and entertainment," adds Broadbent. "With a wide range of product types available, from disposable, reusable, banded and corded earplugs, through to passive and advanced electronic ear muffs, finding a comfortable and suitable product should not be an issue today," she adds.

Returning to respirators, she gives the example of 3M's 8300 Comfort Series cup-shaped respirators, which were developed specifically for comfort. "Features include M-shaped nose clips to make them easier to fit and more comfortable, and super-soft cushioned inner linings and soft waffle edges," says Broadbent – making the point that they were designed to encourage continual use in dusty environments.

She also refers to advances in valve technology aimed, for example, at helping to reduce heat and moisture build-up, so that respirators stay comfortable, even in hot and humid conditions, while modern filter materials also help users breathe more easily.

Hand in glove

Meanwhile, such has been the development of knitted industrial gloves – whether coated or uncoated – that these now represent the fastest growing sector for hand protection in the UK. We're talking about technology that came out of the US Space Agency and requirements issued by the armed forces, which led to the evolution of bullet- and stab-resistant vests, shrapnel-resistant helmets, anti-mine boots and tethers used to strap astronauts to the shuttle during space walks.

"Glove knitting plants today are more science lab than manufacturing facilities, with high-tech knitting machines all synchronised to computer programmed glove designs, operating 24 hours a day, seven days per week, to create the latest high level hand protection," says John Thorne of Marigold Industrial.

In fact, Marigold's plant in Portugal can knit a glove or sleeve capable of safeguarding hands and arms of people handling even razor sharp metal sheets, but also chemical attacks or combinations of both, she says. "For industrial workers, the advances in this material technology have not only meant improvements in the protection afforded against common hazards such as cuts, burns and abrasions, but also in comfort, choice, flexibility and dexterity provided by gloves and sleeves," she adds.

So far, so good, but there is still one more issue to consider with any PPE – whether boots, ear muff or disposable respirators. It is a legal requirement that training and information be provided covering correctly fitting the PPE, when to use it, and how to care for and maintain the equipment.

"An employer has a duty under the PPE 1992 regulations to ensure that comprehensive training and information are given to employees on how to use the PPE," insists Navdip Wilson, a solicitor in the commercial insurance department at law firm Weightmans LLP. "A plant manager must also explain whether an employee needs to take any action to ensure that the PPE remains in an efficient state and in good repair."

Ultimately, for PPE to be truly effective, selecting the best equipment is only part of the challenge. Meeting each user's individual comfort requirements and backing that up with appropriate training complete the picture. Get those right and the odds are vastly increased that both the task in hand and the employee's safety will go hand in glove. PE

Pointers

- Employers have a duty of care to protect employees against noise and vibration
- Hearing and vibration protection are mandatory above prescribed limits
- Training and education are also mandatory components
- It's not just about performance; PPE must be comfortable for the user
- New classes of basic equipment can help
- Removing a simple FFP2 respirator for 10% of the time halves its effectiveness
- Removing hearing protection for 5% of the time reduces protection to near zero

Left: Sarah Broadbent of 3M: "Any usage below 10% of HPE may significantly reduce its effectiveness"