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NOISE CONTROL

Mr. Daniël van Drunen, offshore expert at Alara-Lukagro, looks at the effects of noise on the health and safety of offshore workers

Offshore facilities are generally compact in nature and contain a relatively high proportion of noisy equipment and processes per area of occupancy. Therefore, it is not surprising that noise is a common physical health hazard encountered offshore. It has the potential to cause both physiological and psychological impairment in exposed individuals, which in turn may affect their performance at work and have an impact on production costs.

What are the risks of offshore noise?

"Noise is one of the most prevalent health hazards faced by offshore workers, and can lead to noise-induced hearing loss (NIHL) and sleep disturbance, with subsequent exhaustion and stress", writes R. Gardner in his 2003 report on health risks on offshore oil and gas installations, published by the of Oxford University Press. NIHL has serious and long-term effects: it is permanent and cannot be reversed.

Besides the health risks, significant safety risks are linked to noise. Loud noises interfere with communication and warning signals, and make it difficult to hear moving equipment. Here noise contributes to accidents and injuries – especially when companies reduce noise risks by introducing personal hearing protection, which makes it even harder to communicate and hear warnings.

As well as these human costs, there are potential production costs from reduced productivity levels and sickness absence. In extreme cases of noise-induced hearing loss (NIHL), companies may need to deal with medical emergencies and compensation claims. These are serious implications, when you know NIHL accounts for 75% of all occupational disease claims – as stated by the Health and Safety Executive (HSE), a British institute that shapes regulations, produces research and enforces health and safety law.

When is noise too loud?

When a person is exposed to noise there is always some probability of being affected by an adverse health effect. But how much noise is too much?

According to the L108 – Controlling Noise at Work (2005) report of HSE, all general work areas cannot exceed 83 dB(A) for a 12-hour working day and 85 dB(A) for an 8-hour working day. Above this so called 'upper exposure limit', the employer is required to take reasonably practicable measures to reduce noise exposure, such as engineering controls.

Where reliable speech, telephone or radio communication is required, or demanding mental tasks must be performed, then the noise limits for these areas need to be considerably less than the limit for general work areas. The HSE Offshore Technology Report specifies different noise limits for different areas, varying from a maximum of 70 dB(A) at the workshops, 55 dB(A) in control rooms, to 45 dB(A) in sleeping and recreation areas.

These limits generally apply for broad band noise. Where a noise exhibits dominant tonal characteristics, then it may be desirable to suppress such characteristics.

What are the benefits of controlling noise?

The risks of noise are evident now. Therefore, proper noise control assures the following basic needs of offshore workers are met:

> Minimal risk of hearing damage to personnel in work areas
> Warning signals are audible
> Adequate speech, telephone and radio communication is possible
> Acceptable night rest and recreation environment provided
> Working efficiency is maintained

Is personal hearing protection sufficient?

The HSE suggests that personal hearing protection should not be proposed as a substitute for effective noise control. They are not considered to reduce noise exposure and are therefore not appropriate as a long-term strategy to manage noise exposures. They are strictly viewed as short-term (interim) controls until more substantial engineering and administrative controls can be implemented.

How to reduce offshore noise effectively

Noise risk management principles are based on several options that should be considered. It needs to be assessed whether the noise source can be substituted with a less noisy alternative. If this is not possible or practicable, noise control engineering should be implemented. This means implementing extra measures in order to reduce the equipment's noise, such as:

> sound insulating enclosures for generators, pumps, and other machines
> sound proof control cabins
> acoustic screens
> acoustic ventilation set
> silencers for ventilation openings
> vibration isolators which prevent contact noise

Another option is implementing administrative controls. This means reducing the duration of exposure to noise or removing the person from the noisy environment (i.e. an 'unmanned' facility), if it is practicable to do so.

Personal hearing protection is only for use when the above control options have been implemented as far as reasonably practicable, and unprotected exposures still exceed the prescribed exposure standards.

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