MLN 4.3(C)

Revision No 0

DEPARTMENT OF ECONOMIC DEVELOPMENT

MLC Title 4.3(C) Health and Safety (Noise)

This MLN is part of a series of MLNs which provides guidance on compliance with Isle of Man regulations which give effect to MLC 2006 Title 4.3. Implementation of these guidelines will be taken as evidence of compliance with the Isle of Man regulations.

The guidelines do not preclude the shipowner from demonstrating an equivalent or higher standard as an "alternative method" of evidence of compliance.

Documents referred to in this notice:

Maritime Labour Convention 2006 (MLC);

Health and Safety Executive publication: Noise at Work, INDG362 (rev1);

Maritime and Coastguard Agency publication: Code of Practice for Controlling Risks due to Noise on Ships;

IMO Resolution A.468(XII) Code on Noise Levels on Board Ships;

ISO 1999:1990 Acoustics - Determination of occupational noise exposure and estimation of noise-induced hearing impairment.

Most regulations and notices are available on the Isle of Man Government website: www.iomshipregistry.com or by contacting marine.survey@gov.im

Protecting seafarers from exposure to noise

This Maritime Labour Notice forms part of a series of MLNs for MLC Regulation 4.3 health and safety protection and accident prevention.

MLC regulation 4.3 requires reasonable precautions are to be taken to reduce and prevent the risk of exposure to harmful levels of ambient factors and chemicals on board the vessel. Harmful levels of ambient factors include noise and this MLN explains the Ship Registry regulations and where necessary gives guidance on how to protect seafarers from the adverse effects of noise on board ships.

During the MLC inspection the surveyor will check to ensure that a risk assessment has been carried out and the levels of noise on the vessel have been evaluated. Where there is evidence that there is a risk to seafarers to the exposure from noise or any of the exposure values have been exceeded the surveyor will also look for evidence that the appropriate action as described in this MLN has been taken.

SECTION 1

Introduction

1.1 Why seafarers should be protected from exposure to noise

Noise on board ships can cause hearing loss which can be temporary or permanent. People can experience temporary deafness after leaving a noisy place which although normally recovers within a few hours should not be ignored, it is a sign that continued exposure could cause permanent damage. Permanent hearing damage can be caused immediately by sudden extremely loud explosive noises such as from cartridge-operated machines.

Hearing loss is usually gradual because of prolonged exposure to noise, such as working in an engine room without wearing hearing protection. It may only be when damage caused by noise over the years combines with hearing loss due to ageing that people realise how deaf they have become.

Hearing loss is not the only problem. People may develop tinnitus (ringing, whistling, buzzing or humming in the ears), a distressing condition which can lead to disturbed sleep.

1.2 Definitions used in this MLN

'A-weighted' is used to measure average noise levels;

'C-weighted' is used to measure peak, impact or explosive noises;

`*daily noise exposure level'* is the time-weighted average of noise exposure levels for a nominal eight hour working day as defined by international standard ISO 1999: 1990, point 3.6 and it covers all noise at work, including impulsive noise;

'Impulsive noise` is a noise event of short duration which occurs as an isolated event or as one of a series of events with a repetition rate of less than 15 per second;

'Peak sound pressure' means the maximum value of the 'C' frequency weighted instantaneous noise pressure;

`*weekly noise exposure level'* is the time-weighted average of the daily noise exposure levels of a nominal week of five eight hour working days as defined by international standard ISO 1999:1990, point 3.6 and it covers all noise at work, including impulsive noise.

SECTION 2

Risk assessment

2.1 Risk assessment for noise

It is the shipowner's responsibility to ensure the levels of noise to which seafarers are exposed are risk assessed. This is to help decide what action is needed to be carried out to ensure the health and safety of seafarers who are exposed to noise.

The risk assessment must -

a. determine whether the *exposure action values* and the *exposure limit values* are exceeded (refer to Section 3); and

b. if necessary, shall be based on the measurement of the level of noise to which seafarers are likely to be exposed.

The person carrying out the risk assessment has to identify where there may be a risk from noise and who is likely to be affected. This can be achieved by initially carrying out a walk-round of the vessel to find out where there is potential for harmful noise levels. A discussion with the seafarers should also take place to find out about any portable hand tools they might use, the amount of time they spend in noisy areas of the ship and the availability of personal hearing protection. If seafarers are using portable hand tools any information on noise emissions provided by the manufacturer should also be checked. There may be other information that can be used to help determine if there is a noise problem on the vessel such as records obtained following health surveillance.

As a guide, potentially harmful noise levels are quite likely where seafarers –

a. have to shout to be clearly heard by someone 2 metres away;

b. experience temporary dullness of hearing, or ringing in their ears after leaving the work space;

c. are exposed to impulsive noises such as the sudden release of compressed air, or loud explosive noises from equipment such as cartridge-operated tools;

d. are exposed to high-level impact noise from hammering on metal surfaces, or using chipping hammers; or

e. work in machinery spaces.

If the initial risk assessment identifies areas on the vessel or any work activities where potential harmful noise levels may be present noise measurements may be required to be taken. As a rough guide to determine whether noise measurements are required the test below can be used –

Test	Likely noise level	Noise measurements will be needed if seafarers are subject to this level of noise for more than
The noise is intrusive, but normal conversation is possible.	80 dB(A)	6 hours
You have to shout to talk to someone 2 metres away.	85 dB(A)	2 hours
You have to shout to talk to someone 1 metre away.	90 dB(A)	45 minutes

If any of these tests fail, then a series of measurements will be necessary to assess the seafarer's noise exposure to determine if the *exposure action value* or *exposure limit values* have been exceeded. If any of these levels are exceeded there are additional requirements that must be carried out (refer to Sections 4, 5 & 6).

The noise measurements can be performed by an employee of the shipowner or an external consultant. The person carrying out the measurements must have sufficient training or knowledge in carrying out noise measurements and practical experience in using sound-measuring equipment.

Any measurements taken may include sampling which must be carried out to accurately represent the daily exposure of a seafarer to the noise being assessed. Measurements must also take account of the particular characteristics of the noise to be measured, the length of time seafarers are exposed, any exposure to impulsive noise and other ambient factors. The characteristic of the measuring apparatus also has to be considered which includes the accuracy of the equipment and any calibration tests required to be taken.

When exposure to noise varies noticeably from day to day, *weekly noise exposure levels* may be calculated rather than *daily noise exposure levels*.

Further details on the evaluation and assessment of exposure to noise can be found in the following publications –

- Maritime and Coastguard Agency publication: Code of Practice for Controlling Risks due to Noise on Ships;
- IMO Resolution A.468(XII) Code on Noise Levels on Board Ships;
- ISO 1999:1990 Acoustics – Determination of occupational noise exposure and estimation of noise-induced hearing impairment.

Once the noise assessment has been completed the risk assessment shall –

a. record the significant findings and the measures the shipowner has taken or intends to take to eliminate or control the exposure to noise and any information and training required to be given to the seafarers;

b. state the hearing protection made available;

c. (if appropriate) explain the reason why measurements of the noise levels have not been considered necessary; and

d. be retained on the vessel for inspection purposes.

The risk assessment will have to be reviewed if there are any significant changes in work conditions, or if any health surveillance undertaken indicates seafarer's health is being affected. Noise levels can increase on a ship over time due to wear on machinery or a change of work equipment so it is good practice to review the risk assessment at two yearly intervals.

SECTION 3

Exposure action values and exposure limit values

The *exposure action values* and *exposure limit values* described in this MLN are as follows -

	Daily or weekly noise exposure	**Peak sound pressure**	**Action required**
Lower Exposure Action Values	80dB (A-weighted)	135dB (C-weighted)	If the noise levels are higher than this value – a) suitable and sufficient information, instruction and training are to be provided to seafarers; b) the shipowner is required to provide hearing protection.
Upper Exposure Action Values	85dB (A-weighted)	137 dB (C-weighted)	If the noise levels are at or above this value – a) the shipowner shall ensure as far as practicable that seafarers are wearing hearing protection; b) the area shall be identified by a sign specifying hearing protection is worn and access to the area must be restricted as far as is practicable. If the noise levels exceed this value a programme of technical or organisation measures (or both) shall be established to reduce exposure to as low as is reasonably practicable.
Exposure Limit Values When applying this value account may be taken in any reduction in exposure provided by hearing protection.	87 dB (A-weighted)	140 dB (C-weighted)	Seafarers must not be exposed to noise exceeding this value. If the noise levels exceed this value the shipowner shall ensure that action is taken to reduce the exposure limit to below this value.

SECTION 4

Eliminating or controlling the exposure to noise

4.1 Upper exposure action values

If the *upper exposure action value* has been exceeded or the risk assessment has identified any other risks arising from exposure to noise the risks must be either eliminated at their source, or reduced to a level which is as low as is reasonably practicable.

If it is not reasonably practical to eliminate a risk at source a programme of technical or organisational measures (or both) shall be established and implemented to reduce the exposure. This may include -

1. using other working methods that reduce exposure to noise;

2. replacing existing equipment with equipment which is quieter, for example a low-noise purchasing policy can be adopted when replacing hand held tools or items of machinery;

3. (if practicable) altering the design and layout of workplaces and workstations;

4. instructing and training seafarers to use work equipment correctly, in order to reduce the exposure to noise;

5. reduce noise levels by technical means such as reducing airborne noise by using shields, enclosures or sound absorbent coverings and reducing structure-borne noise by damping or isolation;

6. carrying out appropriate maintenance programmes for machinery;

7. imposing a limit on the time a seafarer spends in noisy areas or working with noisy equipment.

After the technical and organisational measures have been carried out the effectiveness of the measures shall be assessed and if the lower or upper values are still exceeded the requirements as described in Section 5 and 6 shall be implemented.

4.2 Exposure limit values

Seafarers must not be exposed to noise levels exceeding the *exposure limit value*.

If the *exposure limit value* has been exceeded it must be ensured that action is taken to reduce the exposure limit below this value. Also the reasons why the limit has been exceeded should be identified and the organisation and technical measures taken to reduce the exposure should be amended to ensure the *exposure limit value* is not exceeded again. The shipowner shall consult with the seafarers or their representatives on the measures taken to ensure compliance with this requirement.

SECTION 5

Hearing protection and signage

5.1 Hearing protection

Hearing protection has to be made available by the shipowner to any seafarer who is likely to be exposed to noise above the *lower exposure action values*.

If the noise levels are at or above the *upper exposure action values* the shipowner must ensure as far as practicable that hearing protection is worn by the seafarers.

Hearing protection must be effective with the aim of getting at least below 85 dB for each ear. Consideration should also be given as to how comfortable and hygienic the protection is and how it will be worn with other protective equipment such as hard hats and dust masks. Maintenance must also be carried out to ensure the protection functions correctly.

5.2 Use of signage

For all areas of the ship where the noise is likely to exceed the *upper exposure action value* the area must be identified by a sign indicating that hearing protection must be worn and access to this area must be restricted. The sign must be in accordance with the sign and symbol diagram below and may be accompanied with the supplementary sign. The signs should comply with the following -

1. Sign with symbol: the background colour should be blue and the symbol should be white and placed centrally on the background. Blue should cover at least 50% of the area of the sign. The diameter should be 150 mm or 300 mm; and

2. Supplementary sign: this should be rectangular. The background colour should be white with black letters or alternatively the background may be the same colour blue as the sign with the symbol and have white letters. The height of the letters should be a minimum of 20 mm.

Sign with Symbol	
Supplementary sign	

SECTION 6

Seafarer information and training and health surveillance

6.1 Seafarer information and training

If the risk assessment indicates that seafarers are exposed to noise at or above the *lower exposure action value* then suitable and sufficient information, instruction and training shall be provided which shall include -

a. the nature of such risks, including the *exposure limit values* and the *exposure action values;*

b. the measures taken to eliminate or reduce to as low as is reasonably practicable the risks from noise, including the circumstances in which such measures apply;

c. the results of the risk assessment, together with an explanation of the significance and potential of such risks;

d. the availability and correct use of hearing protectors;

e. the circumstances in which seafarers are entitled to health surveillance;

f. safe working practices to minimise exposure to noise; and

g. how to detect and report signs of hearing damage.

6.2 Health surveillance (hearing checks)

The conclusion of the risk assessment may be that because of the risks resulting from noise on the vessel, seafarers are entitled to health surveillance. Health surveillance in this context is an assessment of the state of health of a seafarer so as to provide an early diagnosis of any hearing loss due to noise. Health surveillance can be carried out by regular checks of a seafarer's hearing by an occupational health professional.

Ideally health surveillance would be started before seafarers are exposed to noise to give a baseline. However it can be introduced at any time, and regular checks can be carried out annually for the first two years and then at three yearly intervals. However, if any problems with hearing are detected, or the risk of hearing damage is high this should be more frequent.

The results of any tests can be used to monitor the seafarer's hearing during their employment. The seafarer shall always be informed about the results of their hearing checks. The results from health surveillance should be reviewed and analysed to check if the risk controls are working. Any personal information about the health of individual seafarers shall be treated as confidential.

SECTION 7

Accommodation and service spaces on the vessel

7.1 Except in an emergency, noise in the accommodation and service spaces should not exceed the following limits -

Area	Maximum Noise Limit dB(A)
Accommodation Space	
Cabins and hospitals	60
Mess rooms	65
Recreation room	65
Open recreation areas	75
Offices	65
Service spaces	
Galleys, without food processing equipment operating	75
Serveries and pantries	75

The maximum noise limits stated above are in accordance with IMO Resolution A.468(XII) Code on Noise Levels on Board Ships.

SECTION 8

Exemptions and further information

8.1 Exemptions

An exemption may be permitted in the following circumstance -

'where because of the nature of the work the full and proper use of personal hearing protectors would be likely to cause a greater risk to health or safety than not using such protectors.'

The application will need to detail the work procedure for which the exemption is sought, including information on the seafarers affected, equipment used, and the frequency and length of time the seafarers will be exposed to the noise.

The Ship Registry will only be able to grant an exemption if the following conditions have been met –

a. the risks have been reduced to as low as reasonably practicable. Supporting evidence for this could be if the exemption has received due consideration by a relevant and appropriate medical body, institution or qualified person, this can be an occupational physician, specialist consultant or institution with appropriate expertise;

b. the application for exemption has been made following consultation with the seafarers concerned, or their representatives; and

c. health surveillance has been increased to monitor the safety of the seafarers concerned.

Once issued the exemption may be altered or cancelled by the Ship Registry after giving reasonable notice to the shipowner.

8.2 Further information

Further information on controlling noise levels in the workplace can be found in -

- Health and Safety Executive publication: Noise at work, INDG362 (rev1);
- Maritime and Coastguard Agency publication: Code of Practice for Controlling Risks due to Noise on Ships.

Control of noise on Isle of Man registered vessels