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Code of Safe Working Practices for Merchant Seafarers

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Code of Safe Working Practices for Merchant Seafarers

MSCP01

2015 edition

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Key terms

A **hazard** is a source of potential injury, harm or damage. It may come from many sources, e.g. situations, the environment or a human element.

Risk has two elements:

- The likelihood that harm or damage may occur.
- The potential severity of the harm or damage.

A key tool in ensuring that all involved in the work have a clear understanding and awareness of any hazards and their associated risks is the carrying out of a toolbox talk before the work commences.

Application of the knowledge in the workplace is influenced by our values, beliefs, attitudes and behaviours and by the views of others. This is facilitated by ensuring a safe working culture (see section 1.2.7).

Risk assessment

The risk assessment process identifies hazards present in a work undertaking, analyses the level of risk, considers those in danger and evaluates whether hazards are adequately controlled, taking into account any measures already in place.

Effective risk assessments:

- correctly and accurately identify **all** hazards;
- identify who may be harmed and how;
- determine the likelihood of harm arising;
- quantify the severity of the harm;
- identify and disregard inconsequential risks;
- record the significant findings;
- provide the basis for implementing or improving control measures; and
- provide a basis for regular review and updating.

MSN 1838(M) and MGN 522(M+F)

Potential language difficulties should be taken into account. Temporary staff or those new to the ship or the Company who are not fully familiar with the safety management system or other operational details should be considered where relevant. Other seafarers who should be given special consideration include young persons and pregnant seafarers.

Any risk assessment must address risks to the occupational health and safety of seafarers. Advice on assessment in relation to using personal protective equipment, manual-handling operations and using work equipment is given in Chapters 8, 10 and 18. In addition, specific areas

of work involving significant risk, and recommended measures to address that risk, are covered in more detail in later chapters of the Code.

The assessment of risks must be 'suitable and sufficient' but the process need not be overcomplicated. This means that the amount of effort that is put into an assessment should depend on the level of risks identified and whether those risks are already controlled by satisfactory precautions or procedures to ensure that they are as low as reasonably practicable. The assessment is not expected to cover risks that are not reasonably foreseeable.

Regs 7(1) and (6)

There are no fixed rules about how risk assessment should be undertaken. The assessment will depend on the type of ship, the nature of the operation, and the type and extent of the hazards and risks. The intention is that the process should be simple, but meaningful. The relevant legislation regarding risk assessments should be referred to when deciding on what methodology will be employed. There is a requirement that seafarers must be informed of any significant findings of the assessment and measures for their protection, and of any subsequent revisions made. It is therefore advisable that copies are carried on board each vessel and that there is a process for regular revisions to be carried out. In particular, the risk assessment must be reviewed and updated as necessary, to ensure that it reflects any significant changes of equipment or procedure or the particular circumstances at the time, e.g. the weather or level of expertise of those carrying out the task.

Risk assessment should be seen as a continuous process. In practice, the risks in the workplace should be assessed before work begins on any task for which no valid risk assessment exists.

A simple guide for small businesses can be found in Annex 1.2.

A very effective approach that is employed by some companies is to use a four-level process, as outlined below.

Risk assessment level 1

The ISM Code requires that the safety management objectives of the Company should, amongst other things, assess the risks associated with all identified hazards in respect of its ships, personnel and the environment, and establish appropriate safeguards.

These risk assessments, sometimes known as generic risk assessments, should therefore be carried out at a high level in the Company with appropriately knowledgeable and experienced personnel, and the results used to ensure that appropriate safeguards and control measures are contained within the Company's safety management system in the form of policies, procedures and work instructions.

Risk assessment level 2: task based

In addition to the general requirements under the ISM Code, The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 require that a suitable and sufficient assessment shall be made of the risks to the occupational health and safety of seafarers arising in the normal course of their activities or duties.

There are vessel- and task-specific risk assessments that must be carried out on board each vessel. Whilst it is clear that the Company can assess the generic risk of, for example, working at height, working with electricity, movement about ship, etc., it is not possible for them to conduct a risk assessment for changing a navigation light bulb up the main mast on a given vessel on a given day because they would not be able to take into account all the factors that were applicable at that time on that vessel. For this reason, it is essential that any generic risk assessments are used in context, and not seen as being suitable for specific tasks. For this, task-based risk assessments (TBRAs) should be carried out on board each vessel by those involved in the work.

Two distinct types of TBRA may be used. First, a range of vessel-specific generic TBRAs that can be used for all routine and low-risk tasks can be developed. These should be periodically reviewed, but frequency would very much depend on the particular circumstances on the vessel and the level of risk.

The second type of TBRA would be used for specific high-risk jobs that are not routine, such as working aloft or enclosed space entry. These should relate to the specific persons who will be involved in the work and valid only for the duration of that job.

In both cases, the assessments should be carried out by a competent person or persons who understand the work being assessed. It is also preferable that seafarers who will be involved in the work should also be involved in the assessment process.

Risk assessment level 3: toolbox talk

A toolbox talk is another form of risk assessment carried out in support of a TBRA. Its prime purpose is to talk through the procedures of the job in hand and the findings of the TBRA with the seafarers involved.

When carrying out a toolbox talk, it is important to actively involve those carrying out the work and others who may be at risk, i.e. seafarers, sub-contractors and others on board ship who may be affected by the work. Full and active participation should be encouraged and any questions or concerns discussed and taken into consideration. Once finished, confirm that all fully understand their role in the task and the precautions in place

('closed-loop communication'). This should then be recorded along with details of any relevant risk assessment referred to.

A toolbox talk should be conducted prior to any work being carried out that involves more than one person and where there is significant risk to persons or assets.

Risk assessment stage 4: personal assessment of risk

This is an informal assessment of day-to-day risks carried out as you are going about your work and life in general. It is a technique used to ensure that we perform even the most mundane of tasks without getting hurt. It is used to maintain awareness of our environment at all times and aid in the identification and control of immediate hazards as we go about our work. Use of personal assessment of risk should be developed and encouraged.

This is about taking a few minutes to step back, look at the job to be done, consider what could go wrong and how it may occur, and what steps you can personally take to avoid any incident occurring. As the work is proceeding, you should also monitor the worksite for any change in conditions that might alter the hazards and controls in place. If there is any concern, stop the work, re-assess the controls and, if necessary, re-plan and re-assess the task.

This approach may also be called a 'dynamic risk assessment'. If the person does not believe that the dynamic risk assessment is sufficient move back to stage 2.

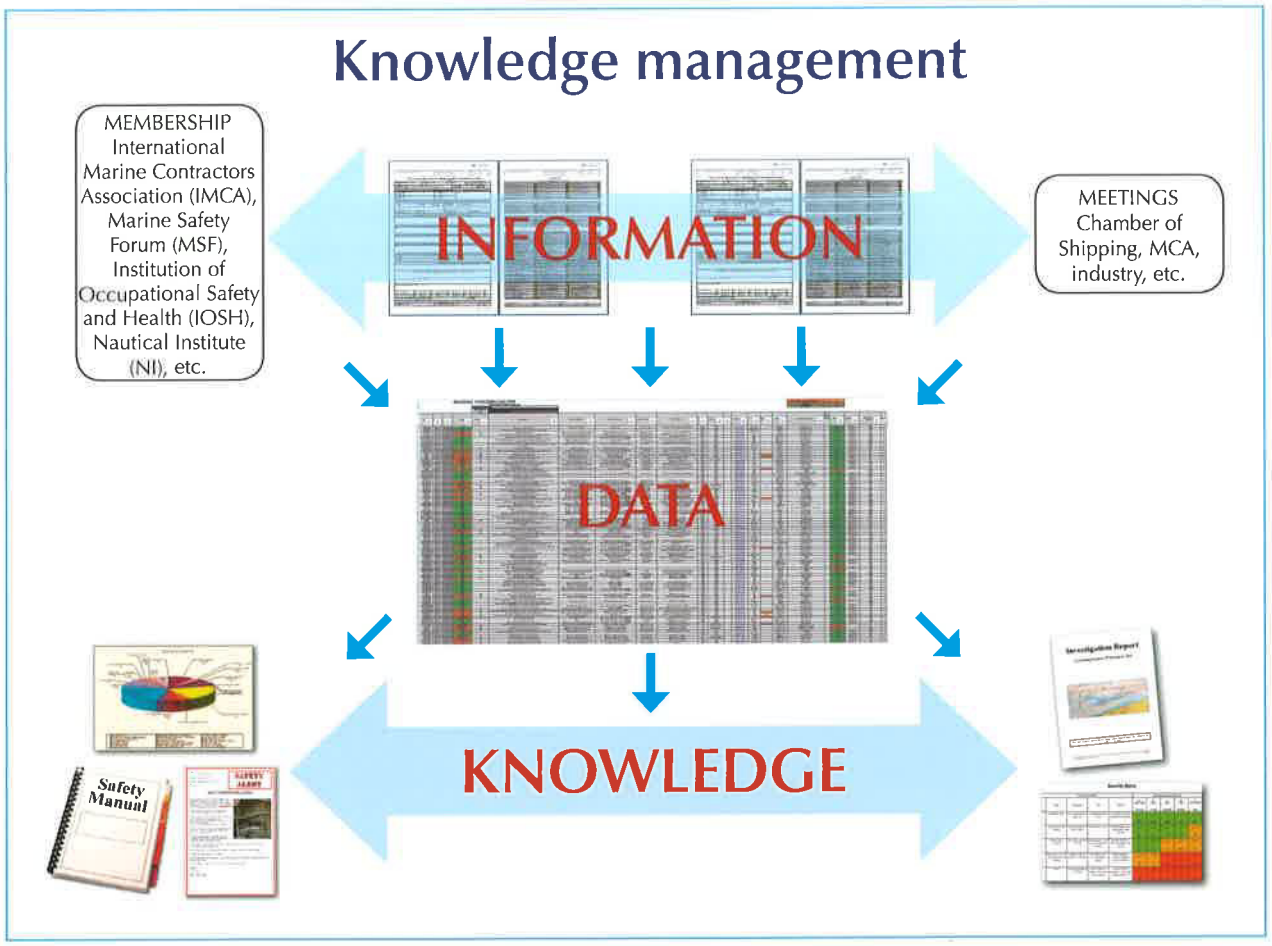
Every task carried out on board the vessel should be subject to risk assessment. This does not mean that a risk assessment needs to be written every time a simple task is carried out, but the existing risk assessment must be referred to as part of a toolbox talk (stage 3) before the task can commence to ensure that the hazards and controls are fully understood, still relevant and appropriate.

Once the task commences, it is important to monitor the work site for any changes in conditions that might alter the hazards and controls in place. If there is any concern, stop work authority should be used.

In all cases, on completion of the task, it is important to record or feedback any lessons learned and make improvements for next time including, where appropriate, reviewing and updating existing risk assessments. Everyone should be encouraged to contribute.

It is recommended that a proactive hazard-reporting system with empowerment and expectation for immediate corrective action is also in place and that information on hazards and risks is shared as widely as possible.

In real terms, therefore, the basis of good knowledge management lies in having effective systems to gather, process, distribute, learn and review throughout the Company and industry to improve understanding of those things that can cause us harm and lead to accidents and incidents, and to encourage all to be fully engaged in the process.



Incident investigation

MGN 484(M) Amendment 1

Effective incident investigation is a key component of a good knowledge management system. In the best systems, this would include all accidents, near misses, unsafe acts, unsafe conditions and non-conformities.

The ISM Code requires that a safety management system includes procedures for reporting, investigating and analysing every non-conformity, accident and hazardous situation, in order to improve safety and pollution prevention. This should then lead to the implementation of corrective actions.

The safety officer will often undertake this work and guidance is provided in Chapter 13, Safety officials. However, on ships with no safety officer, the Company must make other arrangements to ensure that this function is carried out. Any accident or incident should be recorded so that it can

be investigated to find out what went wrong and to see if anything can be done to prevent it happening again.

Every seafarer has a responsibility to:

- report deficiencies, conditions that are causing concern and things that could be improved so that those with specific safety responsibilities can put things right; and
- contribute views on how things could be made safer.

Lessons can also be learned from accidents and incidents on other ships and even in other sectors. Some industry organisations publish accident statistics and safety information and these may help to identify likely risks and suitable safety measures. Information can be found in marine guidance note MGN 484(M) Amendment 1.

Annex 1.2 Five steps to risk assessment

MGN 20(M+F)

Based on www.hse.gov.uk. Alternative text can be found in MGN 20(M+F).

Step 1: identify the hazards

First, you need to work out how people could be harmed. When you work in a place every day, it is easy to overlook hazards, so here are some tips to help you identify those that matter:

- Walk around your workplace and look at what could reasonably be expected to cause harm.
- Ask your employees or their representatives what they think. They may have noticed things that are not immediately obvious to you.

MGN 484(M) Amendment 1

- Consider published information on accidents and near misses on ships, which will highlight common hazards and high-risk activities.
- If you are a member of a trade association or protection and indemnity insurance (P&I) club, contact them. Many produce very helpful guidance.
- Check manufacturers' instructions or data sheets for chemicals and equipment because they can be very helpful in spelling out the hazards and putting them in their true perspective.
- Have a look back at your accident and ill-health records – these often help to identify less obvious hazards.
- Remember to think about long-term hazards to health (e.g. high levels of noise or exposure to harmful substances) as well as safety hazards.
- Consider people who may be particularly vulnerable (e.g. young persons or pregnant seafarers).

Step 2: decide who might be harmed and how

For each hazard, you need to be clear about who might be harmed, because this will help you to identify the best way of managing the risk. That doesn't mean listing everyone by name, but rather identifying groups of people (e.g. 'people working in the storeroom' or 'passers-by').

Remember:

- Some seafarers require particular consideration: new and young seafarers, those for whom the working language of the ship is not their first language, or those new to the ship who may not be familiar with Company or ship safety procedures may be at particular risk. Extra thought will be needed for some hazards.
- Stevedores, contractors and surveyors may not be in the workplace all the time.

- Members of the public could be hurt by your activities.
- If you share your workplace, you will need to think about how your work affects others present, as well as how their work affects your staff – talk to them.
- Ask your crew if they can think of anyone you may have missed.

In each case, identify how they might be harmed, i.e. what type of injury or ill health might occur. For example, crew on roll-on/roll-off ferry car decks may be at risk from excess fumes.

Step 3: evaluate the risks and decide on precautions

Having spotted the hazards, you then have to decide what to do about them. The law requires you to do everything 'reasonably practicable' to protect people from harm. You can work this out for yourself, but the easiest way is to compare what you are doing with good practice.

First, look at what you're already doing; think about what controls you have in place and how the work is organised. Then compare this with the good practice and see if there's more you should be doing to bring yourself up to standard. In asking yourself this, consider:

- Can I get rid of the hazard altogether?
- If not, how can I control the risks so that harm is unlikely?

When controlling risks, apply the principles below, if possible in the following order:

- try a less risky option (e.g. switch to using a less hazardous chemical);
- prevent access to the hazard (e.g. by guarding);
- organise work to reduce exposure to the hazard (e.g. put barriers between pedestrians and traffic);
- issue personal protective equipment (e.g. clothing, footwear, goggles); and
- provide welfare facilities (e.g. first-aid and washing facilities for removal of contamination).

Improving occupational safety and health need not cost a lot. For instance, placing a mirror on a dangerous blind corner to help prevent vehicle accidents is a low-cost precaution considering the risks. Failure to take simple precautions can cost you a lot more if an accident does happen.

Involve staff, so that you can be sure that what you propose to do will work in practice and won't introduce any new hazards.

Step 4: record your findings and implement them

Putting the results of your risk assessment into practice will make a difference when looking after people and your operation.

Writing down the results of your risk assessment, and sharing them with your staff, encourages you to do this. Two examples of risk assessment forms are shown in Annex 1.3 and 1.4. When writing down your results, keep it simple, e.g. 'Tripping over rubbish: bins provided, staff instructed, weekly housekeeping checks' or 'Fume from welding: local exhaust ventilation used and regularly checked'.

A risk assessment does not have to perfect, but it must be suitable and sufficient. You need to be able to show that:

- a proper check was made;
- you asked who might be affected;
- you dealt with all the obvious significant hazards, taking into account the number of people who could be involved;
- the precautions are reasonable, and the remaining risk is low; and
- you involved your staff or their representatives in the process.

If, like many businesses, you find that there are quite a lot of improvements, big and small, that you could make, don't try to do everything at once. Make a plan of action to deal with the most important things first. Occupational safety and health inspectors acknowledge the efforts of businesses that are clearly trying to make improvements.

A good plan of action often includes a mixture of different things such as:

- a few cheap or easy improvements that can be done quickly, perhaps as a temporary solution until more reliable controls are in place;
- long-term solutions to those risks that are most likely to cause accidents or ill health;
- long-term solutions to those risks with the worst potential consequences;
- arrangements for training employees on the main risks that remain and how they are to be controlled;
- regular checks to make sure that the control measures stay in place; and
- clear responsibilities – who will lead on what action and by when.

Remember: prioritise and tackle the most important things first. As you complete each action, tick it off your plan.

Step 5: review your risk assessment and update if necessary

Few workplaces stay the same. Sooner or later, you will bring in new equipment, substances and procedures that could lead to new hazards. It makes sense, therefore, to review what you are doing on an ongoing basis.

Look at your risk assessment and think about whether there have been any changes. Are there any improvements you still need to make? Have your seafarers spotted a problem? Have you learned anything from accidents or near misses? Make sure your risk assessment stays up to date.

When you are running a business, it's all too easy to forget about reviewing your risk assessment – until something has gone wrong and it's too late.

If there is a significant change, don't wait: check your risk assessment and, where necessary, amend it. If possible, it is best to think about the risk assessment when you're planning your change – that way you leave yourself more flexibility.

Annex 1.3 Risk assessment form: example 1

Name of Ship _____ **Record no.** _____

Work Area being assessed _____

Task ID number	Work process/action undertaken in area	Hazards associated with activity	Controls already in place	Significant risks identified	Further assessment required (Y/N)

Declaration:
Where no significant risk has been listed, we as assessors have judged that the only risks identified were of an inconsequential nature and therefore do not require a more detailed assessment.

Signed _____

Annex 1.4 Risk assessment form: example 2

Ship name _____

Record Number _____

Current assessment date: Last assessment date:

Work activity being assessed:

Section 1

Hazard Analysis of the Intended Work Activity

Hazard no.	Description of Identified Hazards	Existing Control Measures to Protect Personnel from Harm
1		(a) (b) (c)
2		(a) (b) (c)
3		(a) (b) (c)
4		(a) (b) (c)
5		(a) (b) (c)
6		(a) (b) (c)
7		(a) (b) (c)
8		(a) (b) (c)
9		(a) (b) (c)
10		(a) (b) (c)

Section 2

Assessment of Risk Factor

Likelihood of Harm	Severity of Harm		
	Slight Harm	Moderate Harm	Extreme Harm
Very Unlikely	VERY LOW RISK	VERY LOW RISK	HIGH RISK
Unlikely	VERY LOW RISK	MEDIUM RISK	VERY HIGH RISK
Likely	LOW RISK	HIGH RISK	VERY HIGH RISK
Very Likely	LOW RISK	VERY HIGH RISK	VERY HIGH RISK

Hazard no.	Likelihood of Harm	Severity of Harm	Risk Factor
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

To assess the risk factor arising from the hazard:

1. Select the expression for likelihood which most applies to the hazard;
2. Select the expression for severity of harm which most applies to the hazard;
3. Cross reference using the Risk Estimator table (above left) to determine the level of risk;
4. If the Risk Factor is MEDIUM or above (Yellow, Orange or Red) additional control measures should be implemented and recorded in Section 3.

Section 3

Additional Control Measures to Reduce the Risk of Harm

Hazard no.	Further Risk Control Measures	Remedial Action Date	Review Date
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Additional comments:

Assessment review date _____

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CHAPTER 3

LIVING ON BOARD

3.1 General

3.1.1 The aim of the Code as a whole is to provide information and guidance aimed at improving the health and safety of those living and working on board ship. This chapter gives some more specific advice for the individual seafarer.

3.2 Fitness, health and hygiene

MSN 1886(M+F) and MSN 1815(M+F) Amendment 3

3.2.1 It is the seafarer's responsibility to look after their health and fitness. The work of a seafarer calls for a high standard of health and fitness, and so every seafarer is required to hold a valid certificate of medical fitness (on a UK ship, ENG1 or recognised equivalent) in order to join a ship. This confirms that, at the time of the medical examination:

- the seafarer's hearing and sight, and where relevant colour vision, met the appropriate standards for their role on board; and
- the seafarer had no conditions likely to be aggravated by service at sea or make the seafarer unfit for their duties or endanger other persons on board.

3.2.2 In the event of any change in their health that may affect their fitness for duty, the seafarer should seek advice, in order that the validity of their medical certificate can be reassessed by an approved doctor. Failure to do so may invalidate the seafarer's medical certificate, and may also place them or their colleagues at risk.

3.2.3 High standards of personal cleanliness and hygiene should be maintained. On board ship, infections can easily be spread from one person to others, so preventive measures, as well as simple, effective treatment, are essential.

3.2.4 Good health depends on sensible diet, adequate sleep and regular exercise. Guidance on healthy eating is available in the Maritime and Coastguard Agency leaflet 'Your health at sea 8: Fit for purpose', or from the National Health Service (NHS) website. Recreational drugs, substance or drug misuse, excesses of alcohol and tobacco should be avoided.

3.2.5 Treatment should be sought straight away for minor injuries; cuts and abrasions should be cleaned and first-aid treatment given as necessary to protect against infection. Barrier creams may help to protect exposed skin against dermatitis and also make thorough cleansing easier.

3.2.6 Rats and other rodents may be carriers of infection and should never be handled, dead or alive, with bare hands.

3.2.7 Personnel on board ship are trained and equipped to provide initial medical care for the range of health problems that may arise. If a seafarer develops a serious health problem or suffers a serious injury, medical advice should be obtained from tele-medical services. Where necessary, arrangements may be made to transport the sick or injured seafarer ashore for medical treatment. Further advice on medical care is contained in *The Ship Captain's Medical Guide*.

3.3 Smoking

3.3.1 Tobacco smoke damages the health of smokers and of those exposed to second-hand smoke. As well as the immediate harmful effects of smoking, it can increase susceptibility to harmful substances including asbestos. Many Companies, therefore, have a smoking policy as part of their promotion of health and safety on board. This policy, while taking into account the extent to which the ship is also the seafarers' home and place of recreation, will usually give priority to protecting non-smokers from the risk of harm from second-hand smoke.

3.3.2 A smoking policy is therefore likely to limit the places on the ship where smoking is permitted, and to include educating smokers of the health benefits of giving up smoking, and promoting schemes to help seafarers to quit. Guidance is also available on the NHS website.

3.3.3 In addition to the health risks, smoking may create a fire risk if matches and cigarettes are not carefully extinguished and disposed of safely. Ashtrays should always be used where provided. The use of safety ashtrays is to be preferred.

3.3.4 Matches and cigarette ends should not be thrown overboard since there is a danger that they may be blown back on board. It is particularly dangerous to smoke in bed.

E-cigarettes

3.3.5 There is evidence that e-cigarettes can cause fires and faulty lithium ion batteries can explode, both of which may lead to injuries. As with all rechargeable electrical equipment, to avoid the risk of fire the correct charger for the device should always be used. In addition, e-cigarettes should not be left charging unattended or overnight. E-cigarette products should be purchased from a reputable retailer to ensure that they are compliant with UK safety regulations.

3.3.6 In accordance with section 3.12.11, or where companies have introduced policies regarding the vetting/portable appliance testing (PAT) of

electrical appliances being brought on board for personal use, e-cigarettes and their chargers may fall under the scope of these requirements and approval should be sought from a responsible officer before use.

3.4 Medication

MSN 1886(M+F)

3.4.1 Anyone taking medication, particularly any medication that may affect alertness, should declare this to the approved doctor conducting their medical examination, and discuss any possible side effects. They should also notify a responsible officer on board, so that allowance may be made in allocating tasks.

3.4.2 Drinking alcohol whilst under treatment with certain medications should be avoided, since even common remedies such as aspirin, seasickness tablets, anti-malarial tablets and codeine may be dangerous in conjunction with alcohol.

3.4.3 The individual has a responsibility to ensure that inoculations and vaccinations required for international voyages are kept up to date and that medications for the prevention of illness, such as suitable anti-malarial tablets, are taken when required.

3.5 Malaria

MGN 399(M)

3.5.1 Preventative medication for malaria must be started in advance of arriving in an affected area. The length of time may vary according to treatment, but around one to three weeks is normal. Medication should continue for four weeks after leaving the area. The Company will need to take medical advice on the best medication for particular areas.

3.5.2 While in infected areas, precautions should be taken to minimise the risk of insect bites.

Protection from insect bites

- Wear long-sleeved tops and trousers when going on deck or ashore.
- Use mosquito wire-screening and nets.
- Keep openings closed.
- Use anti-mosquito preparations or insecticides.

3.5.3 Anyone who falls ill after being in an infected area should inform a doctor immediately that they have been exposed to the risk of malarial infection.

3.5.4 More detailed guidance on prevention is in marine guidance note MGN 399(M) and on prevention and care in *The Ship Captain's Medical Guide*.

3.6 Avoiding the effects of fatigue (tiredness)

IMO, MSC/Circ.813

3.6.1 The International Maritime Organization (IMO) defines fatigue as: 'A reduction in physical and/or mental capability as the result of physical, mental or emotional exertion which may impair nearly all physical abilities including: strength; speed; reaction time; coordination; decision making; or balance.'

3.6.2 Fatigue amongst seafarers is recognised as a serious issue affecting maritime safety. There is clear evidence that fatigue is a contributory cause of accidents, injuries, death, long-term ill health, major damage to and loss of vessels, and enormous environmental harm.

3.6.3 The Company and the master should ensure that work is organised in such a way as to minimise fatigue, but seafarers also have a duty to take care of their own health and safety and that of their fellow workers.

Preventing fatigue

- Ensure you arrive on board well rested at the start of a period of work.
- Take scheduled rest periods.
- Use rest periods to gain adequate, uninterrupted sleep as far as possible (research suggests the body needs about 8 hours of sleep in each 24 hours in total).
- Eat regular, well-balanced meals, but eat lightly before sleep.
- Avoid alcohol and caffeine before sleep.
- Record hours of rest accurately, so that if there are workload pressures at particular times, this becomes apparent to management.

MGN 505(M)

3.6.4 Further information about fatigue, making the most of sleep patterns and ways to maintain alertness are in MGN 505(M).

3.7 Working in hot or sunny climates and hot environments

3.7.1 High humidity and high temperatures can lead to heat exhaustion and heat stroke. Perspiration is the body's best heat-control mechanism, but sweat consists mainly of salt and water which must be replaced. When working in these conditions, it is advisable to drink at least 4.5 litres (8 pints) of cool (but not iced) water daily. It is best to take small quantities at frequent intervals. Salt can be taken in food, supplemented by salt-containing drinks to prevent heat cramps. Alcohol should be avoided.

3.7.2 The length of time that seafarers are exposed to the hot conditions should be limited, and breaks (in the shade or in the fresh air) should be

provided. Mechanical aids to support physically demanding work will help to reduce the impacts of hot environments or when seafarers are wearing a lot of clothing or equipment. See guidance from the Health and Safety Executive (HSE) on thermal comfort.

3.7.3 If working in an enclosed space, steps should be taken to ensure that the space is ventilated as well as possible. Light clothing should be worn, in order to allow the largest possible surface for free evaporation of sweat.

3.7.4 In tropical areas especially, exposure to the sun should be avoided as far as possible, particularly during the hottest part of the day. When it is necessary to work in exceptionally hot or humid conditions, appropriate clothing (including a hat) offering protection to both body and head should be worn. Light cotton clothing will reflect the heat and help to keep the body temperature down. Keep the upper body covered, especially around midday when the sun is at its hottest. Skin that has not been exposed to the sun for several months burns very easily.

3.7.5 Using sunscreen can add useful protection for the seafarer's body, which it is not easy to shade from UVA and UVB rays and sunlight. In European climatic regions, use a sun protection factor (SPF) rating of at least 15. In tropical regions or other areas of high risk, use a SPF of at least 30 (or higher for those with fair skin).

Don't get burnt

- Get to know your skin. This will help decide what precautions you need to take. Getting burnt now might increase the chances of developing skin cancer in later years.
- Try to avoid reddening – it is the first sign of skin damage as well as being an early sign of burning.
- A suntan **may** give some protection against burning but does not eliminate the long-term cancer risk; nor will it protect against premature ageing.
- The best protection is to shade the skin from direct sunlight.
- When on leave, continue to take care as the skin remembers every exposure.
- Use sunscreen generously and reapply regularly.

3.7.6 When working in exceptionally hot and/or humid conditions or when wearing respiratory equipment, breaks at intervals in the fresh air or in the shade may be necessary. Protective clothing and equipment should be removed during breaks, to allow the body to cool down, but it must be replaced before work restarts.

3.8 Working in cold climates and environments

3.8.1 Working in cold climates can impair the seafarer's ability to carry out simple tasks, as the cold temperatures can severely affect dexterity. At even colder temperatures, deeper muscles are affected, which results in reduced muscular strength and stiffened joints. (See the guidelines for working in cold weather on the website of the Canadian Centre for Occupational Health and Safety (CCOHS).)

3.8.2 Early signs that the body is under stress from the cold include:

- persistent shivering;
- poor coordination;
- blue lips and fingers;
- irrational or confused behaviour; and
- reduced mental alertness.

3.8.3 Appropriate clothing should be worn, including gloves, hat and warm socks. Care should be taken to ensure that this is compatible with any personal protective equipment needed for the work in hand.

Cold weather-related injuries/conditions

Frostbite/frostnip can damage the skin and tissue of the parts of the body that are left exposed to freezing temperatures. Extremities, specifically hands, feet, ears, nose and lips, are particularly vulnerable. Clothing that protects the extremities should be worn.

Hypothermia is caused when the body's core temperature falls below 35°C (95°F) and can become life threatening. It is usually caused by being in a cold environment such as being outdoors in cold conditions for a long period of time or falling into cold water.

(See the National Health Service (NHS) Choices website for information on frostbite and hypothermia.)

3.9 Working clothes

3.9.1 Clothing should be appropriate for the working conditions. Working clothes should be close-fitting with no loose flaps, pockets or ties, which could become caught up in moving parts of machinery or on obstructions or projections. Where there is a risk of burning or scalding, as in galleys, clothing and shoes should adequately cover the body and material should be of low flammability, such as cotton.

3.9.2 Shirts or overalls provide better protection if they have long sleeves. Long sleeves should not be rolled up. Long hair should be tied back and covered. Industrial or safety footwear should be worn when appropriate.

3.10 Shipboard housekeeping

3.10.1 Good housekeeping is an essential element in promoting health and safety on board:

- Equipment and other items should be safely and securely stored. This ensures not only that defects are discovered but also that articles can be found when required.
- Fixtures and fittings should be properly maintained.
- All work and transit areas should be adequately lit.
- Electric circuits should not be overloaded, particularly in cabins.
- Garbage and waste materials should be cleared up and disposed of correctly and promptly.
- Doors and drawers should be properly secured.
- Emergency signage and fire and life-saving equipment should be kept clear at all times.
- Instruction plates, notices and operating indicators should be kept clean and legible, and should not be obstructed by other items.

3.10.2 Aerosols may have volatile and inflammable contents. They should never be used or placed near naked flames or other heat source even when empty. Empty canisters should be properly disposed of.

3.10.3 Some fumigating or insecticidal sprays contain ingredients which, though perhaps themselves harmless to human beings, may be decomposed when heated. Smoking may, therefore, be dangerous in sprayed atmospheres until the spray has dissipated and the area has been ventilated.

3.11 Substances hazardous to health

3.11.1 Many substances found on ships are capable of damaging the health of those exposed to them. They include not only recognised hazard substances, such as dangerous goods cargoes and asbestos, but also some maintenance and cleaning substances. For example, caustic soda and bleaching powders or liquids can burn or penetrate the skin. They may react dangerously with other substances and should never be mixed.

3.11.2 Where personnel are working in the presence of substances hazardous to health, appropriate safety measures should be followed to remove, control or minimise the risk of exposure. Packaged cargoes and stores should carry hazard-warning labels, where appropriate. Other hazardous substances should be identified through risk assessment and seafarers given information about the hazards and the measures in place to protect them.

3.11.3 It is important to read carefully all labels on chemical containers before opening them, to find out about any hazards from the contents. A chemical from an unlabelled container should never be used unless it can be clearly established what it is. Further advice is in Chapter 21, Hazardous substances and mixtures.

3.11.4 Older ships may have asbestos-containing products in panels, cladding or insulation. Any damage to such materials in the course of a voyage should be reported immediately to the departmental head. Until the damage can be repaired properly, the area should be sealed off where possible and the exposed edges or surfaces insulated or covered. This will prevent asbestos fibres from being released and dispersed in the air.

3.11.5 Prolonged exposure to mineral oils and detergents may cause skin problems. All traces of oil should be thoroughly washed from the skin. A skin cleaner that is designed for oil removal should be used. Chemical solvents should not be used as they may damage the skin. Inadvertent contact with toxic chemicals or other harmful substances should be reported immediately and the appropriate remedial action taken. Working clothes should be laundered frequently. Oil-soaked rags should not be put in pockets.

3.11.6 Coughs and lung damage can be caused by breathing irritant dust. The risk is usually much greater for a person who smokes than for a non-smoker.

3.11.7 Seafarers should ensure that they are aware of and understand the risks arising from their work, the precautions to be taken and the results of any monitoring of exposure.

3.11.8 Personnel should always comply with any control measures in place, and wear any protective clothing and equipment supplied.

3.11.9 In cases where failure of the control measures could result in serious risks to health, or where their adequacy or efficiency is in doubt, this should be reported so that health surveillance can be undertaken.

3.12 Common personal injuries

Chapter 8 includes advice on suitable personal protective equipment that will help to prevent the following injuries.

Hand injuries

3.12.1 Gloves are a sensible precaution when handling sharp or hot objects but they may easily get trapped on drum ends or on machinery. While loose-fitting gloves allow hands to slip out readily, they do not give a good grip on ladders. Wet or oily gloves may be slippery and great care should be taken when working in them. Wearing gloves for long periods

may make skin hot and sweaty leading to damage. Wearing separate cotton gloves inside protective gloves will help to prevent this.

Foot injuries

3.12.2 Unsuitable footwear (such as sandals, plimsolls and flip-flops) gives little protection if there is a risk of burning or scalding, for example, and may lead to trips and falls. Care should be taken to keep feet away from moving machinery, bights of ropes and hawsers.

Eye injuries

3.12.3 Great care should be taken to protect the eyes. Appropriate protective goggles should be worn for any work involving sparks, chips of wood, paint or metal, and dangerous substances.

Head injuries

3.12.4 It is important to remember to duck when stepping over coamings, etc. to avoid hitting the head on the door frame, and head protection should be worn where appropriate.

Cuts

3.12.5 To avoid cuts, all sharp implements and objects should be handled with care. They should not be left lying around where someone may accidentally cut themselves. In the galley, sharp knives and choppers should not be mixed with other items for washing up but cleaned individually and stored in a safe place. Broken glass should be swept up carefully, not picked up by hand.

Burns and scalds

3.12.6 Burns and scalds are commonly caused by hot pipelines and stoves, as well as by fires. Every hot machine and every container of scalding liquid should be regarded as a hazard, capable of causing injury, and adequate precautions should be taken.

3.12.7 Faulty electrical equipment can cause severe burns as well as an electric shock. Equipment should be checked before use and if something appears wrong, it should be reported.

Misuse of tools

3.12.8 Injury can be caused by the misuse of tools. It is important always to use the correct tool for the job, and to make sure it is used in the right way. Tools should never be left lying around where they can fall on someone, or be tripped over. After a job is finished, they should be put away in a safe place.

Manual handling

3.12.9 It is easy to strain muscles when manual handling. Pulled muscles may be avoided if proper lifting techniques are used. Chapter 10 gives guidance on handling loads.

Mooring

3.12.10 Mooring and unmooring operations provide the circumstances for potentially serious accidents. Personnel should never stand in the bight of a rope or near a rope under tension, and they should treat ropes on drums and bollards with the utmost care.

Electrical hazards

3.12.11 Unauthorised persons should not interfere with electrical fittings. No personal electrical appliance should be connected to the ship's electrical supply without approval from a responsible officer.

3.12.12 Clothing or other articles should be left to dry only in designated areas, not in machinery spaces or over or close to heaters or light bulbs. This may restrict the flow of air and so lead to overheating and fire.

3.12.13 Hand-pressing irons should not be left standing on combustible materials. They should be switched off after use and stowed safely.

3.13 Sunglasses

3.13.1 The bright light from the sun reflecting off the surface of a calm sea or from ice caps in the Polar regions, or from the vessel itself, can dazzle the seafarer and cause damage to the eyes.

3.13.2 In these conditions, seafarers working on the bridge or on the open deck should wear sunglasses, which are an important piece of protective equipment, rather than tinted eye protection. For protection on the bridge, collective protection systems should always be considered; for example, sunblinds.

BS EN ISO 12311:2013

BS EN ISO 12312-1:2013+A1:2015

3.13.3 The following guidance should be considered when purchasing sunglasses.

- The lens tint should be neutral – ideally either grey or brown as these cause the least colour distortion.
- The lens tint should be no darker than 80% absorption.
- A graduated tint, with the darkest at the top of the lens, lightening towards the bottom, may be useful.
- Glasses should be CE marked and to the British Standard BS EN ISO 12312-1:2013+A1:2015. BS EN ISO 12311:2013 ensures that the sunglasses offer a safe level of ultraviolet protection.

MGN 357(M+F)

3.13.4 Photochromic lenses react with UV radiation by darkening. Sunglasses with photochromic lenses **must not** be worn during the hours of darkness as they can significantly reduce night vision. Information is given in MGN 357(M+F).

3.13.5 Polarised lenses reduce the amount of light passing through the lens by selective filtering of certain electromagnetic spectral planes. Polarised lenses should not be used when viewing instrument panels as the visibility of some images may be unclear. In some situations, for example, when navigating in shallow water, the wearing of these lenses may be beneficial as they can reduce the reflected glare from the surrounding water. Seafarers should be aware of the benefits and limitations of polarised lenses.

3.13.6 All frames should be well fitting and large enough to allow sufficient protection from oblique sunlight. All seafarers requiring a spectacle prescription must have a clear pair of correcting lenses but can have prescription sunglasses as their second pair. The wearing of non-prescription sunglasses on top of prescription glasses is not permitted. For navigational watches during the hours of darkness, the wearing of any type of sunglasses is not recommended.

3.14 Risk from sharps

Introduction

3.14.1 The term 'sharps' includes needles, syringes and razor blades.

3.14.2 Sharps may be used for the treatment of medical conditions, for recreational drug use or for wet shaving. Housekeeping staff may, therefore, come across these items in bed linen, on surfaces or in bins, and precautions should be taken to avoid injury and the risk of contamination with blood-borne viruses (BBVs). The main BBVs or concerns are:

- hepatitis B (HBV);
- hepatitis C (HCV); and
- human immunodeficiency virus (HIV).

There is a risk of bacterial or viral infection from used sharps.

3.14.3 As there is always a potential risk of coming across sharps unexpectedly, advice should be taken from a medical practitioner about whether seafarers exposed to this risk should have a tetanus or hepatitis B vaccination as a precaution. [For UK residents, these are provided free of charge on the NHS.]

3.14.4 The following precautions will reduce the risk:

- All housekeeping staff should be trained in safe systems of work, and what action to taken if they come across a sharp.
- Supervisors should be familiar with the safe systems of work and what to do in the event of injury.

Rubbish collection

3.14.5 Items should never be removed by hand from the bin.

3.14.6 Where bin liners are used, a check should be made that the weight is ok to lift, and then the liner should be removed fully from the bin and placed in a sturdy rubbish collection sack. To reduce the risk of being accidentally stabbed with a discarded needle or razor, hands should never be put inside a sack or a bin when emptying the contents.

3.14.7 Where no bin liner is in use, a check should be made that the weight of the bin is ok to lift, and then the contents should be emptied directly into a sturdy rubbish collection sack.

3.14.8 The collection sack should not be overfilled. If the contents need to be compressed, this should be done with a brush or other similar object, not with the hands.

3.14.9 Any rubbish sack should be carried as far from the body as possible, to prevent any unseen sharp objects causing injury. If it becomes apparent that there are sharp objects in the bag, the bag should be placed on the floor and appropriate assistance should be sought.

Cleaning/housekeeping

3.14.10 Care should be taken to avoid putting hands into blind/obstructed areas; for example, toilet U-bends or under sheets or pillows.

BS EN ISO 23907:2012

3.14.11 All needles/syringes found must be disposed of in a sharps container (or rigid-sided container), following the safe system of work (see section 3.14.4). If a sharp is found, it should always be assumed that it is infectious. The area should be closed off immediately to all personnel and a supervisor should be notified. The incident should be reported to a supervisor so that a record can be kept of the location, date and time as a hazardous occurrence.

3.14.12 Broken glass and crockery should be handled carefully and wrapped in several sheets of paper before being placed in the bin.

Removal of sharps: safe working procedure

3.14.13 Only trained staff should remove sharps.

3.14.14 When sharps are found, they should never be carried to a sharps

container for disposal. The sharps container should be taken to where the sharp has been found, and placed near the sharp.

3.14.15 Sharps should never be picked up with bare hands or passed from hand to hand. Either:

- appropriate protective clothing (stout rigger, rubber gloves or specialist anti-needle gloves) should be worn if removing the sharp with a small pair of tongs; or
- a long-handled litter-picking device should be used to pick up the sharp. No gloves are needed in this case as the distance between the sharp and the individual reduces the risk of contact.

3.14.16 Sharps should not be put in a normal waste bin. Always use a sharps container. The sharps container should not be filled beyond the level indicated on the side.

3.14.17 No attempt should be made to re-sheath or bend the needle.

If an injury occurs

3.14.18 If the skin is pierced by a needle or razor blade:

- The wound should be gently encouraged to bleed, but not scrubbed or sucked.
- The wound should be washed with soap and water.
- The incident should be reported immediately to a supervisor.
- Unless there is a doctor on board, radio medical advice should be sought.

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10.5 Safety for seafarers rigging accommodation and pilot ladders

10.5.1 Where a work activity involves lifting from deck or over side (e.g. raising of pilot ladders), guidance on body posture and technique still needs to be followed to limit musculoskeletal injury. Adequate additional manual help and/or appropriate means should be used wherever possible and risks assessed. Where manual handling is unavoidable, the ladder should be lifted from no lower than deck level in stages rather than trying to lift from overside. (See Chapter 22, Boarding arrangements, section 22.10.)

10.5.2 The dangers associated with this work activity should be risk assessed as working overside, requiring a permit to work and the use of control measures such as a safety line, fall prevention device, safety harness and wearing of lifejackets. (See Chapter 17, Work at height, section 17.2.6 and Chapter 22, Boarding arrangements, section 22.5.5.)

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CHAPTER 12

NOISE, VIBRATION AND OTHER PHYSICAL AGENTS

12.1 General advice

12.1.1 A physical agent is an environmental factor such as noise, vibration, optical radiation and electromagnetic fields that may damage the health of those exposed to them. Poor environmental conditions may also be a contributing factor in increasing the level of fatigue suffered by seafarers.

12.1.2 The Company's risk assessment will identify where personnel are working in the presence of physical agents hazardous to health or safety (including fatigue), and evaluate any risks from exposure (see Chapter 1, Managing occupational health and safety). Appropriate measures should be taken to remove, control or minimise the risk (see section 12.2).

12.1.3 The risk assessment will also provide information to determine whether health surveillance is appropriate (see Chapter 7, Health surveillance).

12.1.4 The Company should provide information and relevant training to personnel so that they know and understand the risks from any physical agents arising from their living and working environment, the precautions to be taken and the results of any monitoring of exposure.

12.1.5 Where exposure to a physical agent arises from the use of a particular piece of equipment, reference should be made to any instructions and operating data supplied by the manufacturer of that equipment.

12.1.6 Reference may also be made where appropriate to any publications on the subject issued by the Health and Safety Executive (HSE) or other appropriate body.

12.2 Prevention or control of exposure to a physical agent

12.2.1 The first consideration should always be to prevent risk by removing exposure to the physical agent concerned (elimination).

12.2.2 Where this is not reasonably practicable, prevention or control of exposure may be achieved by any combination of the following means:

- Use of plant, processes and systems of work that minimise exposure to the physical agent.

- Total or partial enclosure of the equipment concerned.
- Keeping the number of persons who might be exposed to a physical agent to a minimum, and reducing the period of exposure.
- The designation of areas that may be subject to hazardous levels of exposure to a physical agent, and the use of suitable and sufficient warning signs.
- Use of appropriate procedures for the measurement of hazardous levels of exposure to a physical agent, particularly for the early detection of abnormal exposures resulting from an unforeseeable event or an accident.
- Taking collective or individual protection measures.
- Where appropriate, having plans in place to deal with emergency situations that could result in abnormally high exposure to physical agents.

12.2.3 These measures should be applied to reduce the risk to seafarers as much as reasonably practicable but, where they do not adequately control the risk to health, appropriate personal protective equipment (PPE) should be provided.

12.2.4 The Company should take reasonable steps to ensure that all control measures are properly used and maintained. Seafarers should comply fully with the control measures in force.

12.2.5 For certain physical agents, specific control measures apply, e.g. noise and vibration. In cases where failure of the control measures could result in risk to health and safety, or where their adequacy or efficiency is in doubt, the exposure of seafarers should be monitored and a record kept for future reference.

12.3 Consultation

12.3.1 Ship safety representatives and seafarers should be consulted about proposals to manage risks from exposure to physical agents and health problems arising from such exposure. Consultation should cover the results of the risk assessment, proposals for control, procedures for providing information and training for seafarers, and any health-monitoring system.

12.4 Seafarer information and training

12.4.1 The Company should provide seafarers with sufficient information and training to ensure that they are aware of potential risks to their health from exposure to physical agents. Such information should

selected. The use of high-vibration tools should be avoided wherever possible.

12.14.3 When work equipment requires replacement because it is worn out, the Company should choose replacements that are suitable for the work to be carried out, efficient and, wherever possible, cause lower vibration levels. It is recommended that the Company has a policy on purchasing suitable equipment, taking account of vibration emission, efficiency and any specific requirements.

12.14.4 Appropriate maintenance programmes for equipment should be drawn up to prevent avoidable increases in vibration through the use of blunt or damaged equipment or consumable items.

12.14.5 Seafarers using equipment that can cause vibration should be provided with appropriate training and instruction on its correct use.

12.14.6 The Company should plan tasks to avoid seafarers being exposed to vibration for long, continuous periods.

12.14.7 Seafarers should be provided with protective clothing where appropriate. Whilst gloves can be used to keep hands warm, they may not in themselves provide protection from vibration.

12.14.8 Further guidance is available in the MCA's official guide to complying with the Merchant Shipping and Fishing Vessels (Control of Vibration at Work) Regulations 2007.

12.15 Mitigation: whole-body vibration

12.15.1 Vibration may be reduced by regular maintenance of engines and machinery, adjusting the speed of operation or other settings. Seafarers should be provided with information on how to minimise vibration in this way. Severe shocks or jolts should be avoided as far as possible.

12.15.2 When exposure to vibration is unavoidable, the risk of harm can be reduced by:

- scheduling work to avoid long periods of exposure to vibration in a single day;
- planning work so that seafarers do not have to sit in one position for too long;
- ensuring that seafarers maintain good posture while working, e.g. arranging tasks as far as possible to avoid twisting and stretching;
- where possible, adjusting seating to provide good lines of sight, adequate support to the back, buttocks, thighs and feet, and ease of reach for foot and hand controls;

- providing adequate rest periods, e.g. allow a short break between operations in small fast vessels or mobile machinery and manual handling, to give tired muscles time to recover before handling heavy loads;
- if working in cold and damp conditions, ensuring that seafarers wear warm, and (if necessary) waterproof clothing; cold exposure may accelerate the onset or worsen the severity of back pain.

When all reasonable steps have been taken to avoid exposure to vibration and to reduce the level of vibration, the final resort for compliance with the ELV is to limit the duration of exposure.

MGN 436(M+F) Amendment 1

12.15.3 Marine guidance note MGN 436(M+F) Amendment 1 gives guidance on mitigating the risks from whole-body vibration for those working in small, fast craft.

12.15.4 Further guidance is available in the MCA's official guide to complying with the Merchant Shipping and Fishing Vessels (Control of Vibration at Work) Regulations 2007.

12.16 Health surveillance and health monitoring: vibration

12.16.1 If there is considered to be a potential risk of harm to seafarers from hand–arm vibration, health surveillance should be provided for vibration-exposed seafarers in accordance with Chapter 7, Health surveillance, of this Code. This will apply when seafarers:

- are likely to be regularly exposed above the EAV of 2.5 m/s^2 A(8);
- are likely to be exposed occasionally above the EAV and where the risk assessment identifies that the frequency and severity of exposure may pose a risk to health; or
- have a diagnosis of hand–arm vibration syndrome (HAVS) (even when exposed below the EAV).

12.16.2 Specific guidance on health surveillance for hand–arm vibration risks is available on the HSE website.

12.16.3 Monitoring symptoms of back pain may be useful for identifying health problems and intervening to prevent problems being caused or made worse by work activities. It can also provide information on the effectiveness of current control methods in place, and identify those who are particularly sensitive to whole-body vibration. Older seafarers, people with back problems, young seafarers and pregnant seafarers are at greater risk. Guidance on health monitoring for those at risk from whole-body vibration, including the use of health monitoring

questionnaires to monitor seafarers' symptoms, is available on the HSE website.

12.17 Additional guidance

MGN 353(M+F)

Sources of additional guidance are listed in marine guidance note MGN 353(M+F).

12.18 Other physical agents

Guidance on protection from artificial optical radiation and electromagnetic fields are listed in the Appendices.

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Reg. 20(3)

13.2.6 It is also the Company's and the employer's responsibility to ensure that workers or their elected representatives have access to relevant information and advice about health and safety matters from inspection agencies and health and safety authorities and, from their own records, about accidents, serious injuries and dangerous occurrences.

Reg. 20(4)

13.2.7 The Company and the employer must give elected representatives adequate time off normal duties, without loss of pay, to enable them to exercise their rights and carry out their function effectively. Safety representatives must not suffer any disadvantage for undertaking this function.

13.3 Company duties

13.3.1 The regulations

S.I. 1997/2962, Regs 15–18

13.3.1.1 This section applies only to ships on which five or more seafarers are working. The regulations dealing with safety officials give duties to the Company for the appointment of ships' safety officers (see section 13.3.2 of this Code), the election of safety representatives with specified powers (section 13.3.3) and the appointment of a safety committee (section 13.3.4).

13.3.1.2 The Secretary of State may grant ad hoc exemptions to specific ships or classes of ships subject to any relevant special conditions. This is to allow different arrangements to be made in cases where the requirements of the regulations would be difficult to apply. An example might be a multi-crew ship with alternate crews working on a regular shift basis. In considering a request for exemption, the Maritime and Coastguard Agency (MCA) would need to be satisfied that effective alternative arrangements existed, and would make it a condition of the exemption that these were continued.

13.3.2 Appointment of safety officers

Reg. 15

13.3.2.1 On every seagoing ship on which five or more seafarers are employed, the Company is required to appoint a safety officer. The master must record the appointment of a safety officer – this should be in the official logbook.

13.3.2.2 The safety officer is the safety adviser aboard the ship and can provide valuable assistance to the Company and to all on board in meeting the statutory responsibilities for health and safety. Some training may be provided on board, but the safety officer should have attended a suitable safety officer's training course.

Suitable safety officer training should cover the following topics:

- The tasks of the safety committee.
- The rights and roles of members of the safety committee.
- How to carry out risk assessment and management.
- How to provide the necessary advice to resolve safety concerns or problems and to encourage adherence to prevention principles.
- Supervision of safety tasks assigned to crew and other seafarers on board, and passengers where applicable.
- Accident and incident investigation, analysis and making appropriate corrective and preventative recommendations to prevent their recurrence.
- Human and organisational factors in safety critical work.
- How to obtain relevant information on a safe and healthy working environment from the competent authority and the Company.
- Effective means of communication with a multinational crew.
- The commitment required to promote a safe working environment on board.

In addition, the safety officer should be familiar with the following:

- The occupational safety and health policy and programmes used on board.
- The safety tasks assigned to crew and other personnel on board, and passengers where applicable.

The safety officer should be familiar with the principles and practice of risk assessment, and should be available to advise those preparing and reviewing risk assessments. It is recognised that, where the safety officer also has other responsibilities (e.g. chief officer) they may well conduct risk assessments themselves. However, the general principle is that the safety officer takes an independent view of safety on behalf of the Company.

13.3.2.3 Although not prohibited by the regulations, the appointment of the master as the safety officer is not generally advisable. This is because the safety officer is required amongst other duties to make representations and recommendations on health and safety to the master.

13.3.2.4 If possible, the Company should avoid appointing as safety officer anyone to whom the master has delegated the task of giving medical treatment. This is because one of the duties of the safety officer is to investigate incidents, and they would not be able to give proper attention to this function while providing medical treatment for any casualties.

13.7 Advice to safety committees

13.7.1 The safety committee is a forum for consultation between the master, safety officials and others of matters relating to health and safety. It may be used by individual employers for consultation with the Company and seafarers. Its effectiveness will depend on the commitment of its members, in particular that of the master. Because of its broad membership, and with the master as its chairman, the committee has the means to take effective action in all matters which it discusses other than those requiring the authorisation of the Company and individual employers. Safety committee meetings should not be used for the purposes of instruction or training.

13.7.2 The frequency of meetings will be determined by circumstances, but the committee should meet regularly, taking into account the pattern of operation of the ship and the arrangement for manning and with sufficient frequency to ensure continuous improvement in safety. In particular, a meeting should also be held after any serious incident or accident on the ship, if the normal meeting is not due within a week.

13.7.3 An agenda (together with any associated documents and papers, and the minutes of the previous meeting) should be circulated to all committee members in sufficient time to enable them to digest the contents and to prepare for the meeting.

13.7.4 If there is a particularly long agenda, it may be better to hold two meetings in fairly quick succession rather than one long one. If two meetings are held, priority at the first meeting should, of course, be given to the more urgent matters.

13.7.5 The first item on the agenda should always be the minutes of the previous meeting. This allows any correction to the minutes to be recorded and gives the opportunity to report any follow-up action taken.

13.7.6 The last item but one should be 'any other business'. This enables last-minute items to be introduced, and prevents the written agenda being a stop on discussion. Any other business should be limited to important issues that have arisen since the agenda was prepared. All other items should be submitted for inclusion in the agenda of the next meeting.

13.7.7 The last item on the agenda should be the date, time and place of the next meeting.

13.7.8 Minutes of each meeting should record concisely the business discussed and conclusions reached. A copy should be provided to each committee member. They should be agreed as soon after the meeting as possible, or amended if necessary, and then agreed under the first agenda item of the following meeting (see section 13.7.5).

13.7.9 A minutes file or book should be maintained, together with a summary of recommendations recording the conclusions reached, in order to provide a permanent source of reference and so ensuring continuity should there be changes in personnel serving on the committee.

13.7.10 All seafarers should be kept informed on matters of interest which have been discussed, e.g. by posting summaries or extracts from the minutes on the ship's noticeboards. Suggestions may be stimulated by similarly posting the agenda in advance of meetings.

13.7.11 Relevant extracts of agreed minutes should be forwarded through the master to the Company and, where appropriate, individual employers, even when the matters referred to have already been taken up with them. A record of response or action taken by the Company should be maintained.

13.8 Accident investigation

S.I. 2012/1743

13.8.1 The investigation of accidents and incidents plays a very important part in safety. It is by the identification and study of accidents principally through the MAIB's accident reporting system that similar events may be prevented in future.

MGN 564(M+F) Amendment 1

13.8.2 Marine guidance note MGN 564(M+F) Amendment 1 provides guidance on how to comply with the statutory requirements.

S.I. 1997/2962, Reg. 16(1)(b)

13.8.3 The master is responsible for the statutory reporting of accidents and dangerous occurrences covered by the regulations. Where a safety officer is on board, however, it is their statutory duty to investigate every such incident and it is expected that the master will rely extensively on the results and record of the safety officer's investigation when completing their report. The various stages of the typical investigation might proceed as follows:

- When an incident occurs, priority must be given to the safety of the injured and of those assisting them, and to the immediate safety of the area. When sufficient help is available, however, the safety officer should, if possible, avoid involvement with the rescue operation and concentrate on establishing the immediate facts concerning the incident.

- First, the names should be recorded – and addresses in case of non-crew personnel – of all those present in the vicinity of the incident. Not all are likely to be witnesses to the actual incident but this can be ascertained later. The position of the injured should be noted and marked, and the use and condition of any protective clothing, equipment or tools, etc. likely to have been in use. Any portable items that might have some relevance to the investigation should be put into safe storage. Sketches and photographs are often useful.
- When the injured have been removed, the safety officer should carry out a more detailed examination at the scene of the incident, watching out for any changes that might have occurred since the incident and any remaining hazards.

13.8.4 The points to look out for will depend on the circumstances. For example, after an incident during boarding, the following should be noted:

- Compliance with control measures identified by the risk assessment.
- The type of access equipment in use.
- The origin of the access equipment, e.g. ship's own, provided from shore.
- The condition of the access equipment itself, noting particularly any damage such as a broken guardrail or rung. The position and extent of any damage should be examined so that it may be compared with witnesses' statements, and it should be noted whether the damage was present before, or occurred during or as a result of the incident. (If the damage was present before the incident it might have been potentially dangerous but it may not necessarily have been a factor in the particular incident.)
- Any effect of external factors on the condition of the equipment, e.g. ice, water or oil on the surface.
- The deployment of the equipment, i.e. the location of the quayside and shipboard ends of the equipment.
- The rigging of the equipment, the method of securing, the approximate angle of inclination.
- The use of ancillary equipment (safety net, lifebuoy and lifeline, lighting).
- The safety of shipboard and quayside approaches to the equipment, e.g. adequate guardrails, obstructions and obstacles.

- Any indication of how the incident might have happened, but remember that subsequent interviews with witnesses must be approached with an open mind.
- The weather conditions at the time.
- Distances where these are likely to be helpful or relevant.

For all incidents, consider human and organisational factors that may have contributed to the accident. Marine guidance note MGN 520(M) includes common factors in accidents. The following are examples of issues that may be relevant:

Individual factors

- honest errors and mistakes versus violations and recklessness.

Job factors

- physiological and psychological problems caused by the ship environment (for example, noise affecting communication, vibration, changes in workload/duties);
- working pattern and likelihood of fatigue and stress;
- any recent technical changes and the associated training or instruction;
- job and equipment design;
- effectiveness of procedures;
- performance-influencing factors; or
- teamwork and communication.

Organisational factors

- policies, organisation, culture;
- recruitment, competence assurance; or
- bullying and harassment.

13.8.5 Interviews of witnesses should take place as soon as possible after the incident when memories are still fresh. There may be people who were not actually witnesses but who may nevertheless have valuable contributions to make, e.g. a seafarer who was present when an order was given. These persons should not be overlooked. If it is not possible for some reason to interview a particular person, they should be asked to send the safety officer their own account of the incident.

13.8.6 The actual interview should be carried out in an informal atmosphere designed to put the witness at their ease. To start with, the safety officer should explain the purpose of the interview and obtain some details of the witness's background. It is important to keep any personal bias out of the interview. The witness should be asked to relate the event in their own way with as few interruptions as possible. The accuracy of what is said should be tested. There may, for example, be discrepancies between the account of one witness and those of other witnesses, between different parts of a statement, or with the safety officer's own observations, which the safety officer may want to query. Leading questions implying an answer should be avoided, as should simple questions requiring only a yes/no answer which save the witness from thinking about what they are saying. Finally, the safety officer should go over the statement with the witness to ensure that it has been accurately recorded.

13.8.7 Statements for signature by the witness should be prepared as quickly as possible but if the witness changes their mind about signing a statement, it should be annotated by the safety officer that it has been prepared on the basis of an interview with the witness who had subsequently declined to sign it or comment further. Where the witness asks for extensive alterations to the original statement a fresh statement may have to be prepared, but the original statement should be annotated by the safety officer and retained.

13.8.8 It is helpful to adopt a standard format for statements by incident witnesses. A suggested format is at Annex 13.2.

13.8.9 It is worth emphasising the importance of distinguishing between facts and opinions. Facts can normally be supported by evidence whereas opinions are personal beliefs. An investigation must depend on the facts gathered but opinions can be helpful in pursuing a particular line of enquiry and should not be disregarded.

13.8.10 Any record of incidents and dangerous occurrences (see section 13.4.5.1) should at least contain:

- details of incidents/dangerous occurrences/investigations/complaints/inspections;
- date;
- persons involved;
- nature of injuries suffered;
- all statements made by witness;
- any recommendations/representations; and
- any action taken.

13.8.11 Additionally, it is suggested that it should contain:

- a list of witnesses, addresses, positions and occupations;
- the whereabouts of original signed statements made by witnesses;
- the date when the accident/dangerous occurrence reports were sent to the MAIB if applicable;
- a list of items collected, why and where stored; and
- an index.

13.8.12 The record should be kept with the ship because it must be made available on request to the safety representative and safety committee, if any. It is also a necessary item of reference for safety officers on board the ship. If the ship is sold and remains on the UK register, the record should be transferred with the ship. Where the ship becomes a foreign ship the record should be retained by the original owners.

Annex 14.1 Permits to work

Permits to work would normally be required for the following categories of work:

- entry into dangerous (enclosed) space;
- any work requiring use of gas testing/equipment;
- hot work;
- working at height/over the side;
- general electrical (under 1000 volts);
- electrical high voltage (over 1000 volts);
- working on deck during adverse weather; and
- lifts, lift trunks and machinery.

This list is not exhaustive. Permits to work, following a similar format, may be required and developed for other categories of work.

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17.6.4 The duty engineer and deck officers should also be informed by the person in charge when personnel are working in the vicinity of ship's side discharges so that they are not used until the work is completed. Equipment should be isolated and/or notices to this effect should be attached to the relevant control valves and not removed until the work is completed.

17.7 Scaffolding, including scaffolding towers

MGN 410(M+F), Annex B

17.7.1 Annex 17.4 (reproduced from MGN 410(M+F)) gives further guidance.

17.7.2 Only scaffolding of an approved design should be used and rigged in conformity with a generally recognised configuration. If necessary, a calculation of its strength should be carried out by a competent person and recorded. Appropriate procedures for conducting testing should be followed. When replacing components, care should be taken to ensure compatibility with the existing scaffolding, and retesting of the structure may be required.

17.7.3 Care should be taken when assembling and dismantling the scaffold (see Annex 17.4).

17.7.4 Great care should be taken to ensure the stability of the structure and safe access to it. If it is a mobile structure, it should be securely fixed to ensure that it cannot inadvertently move while in use. Never move a scaffolding tower while people or materials are on the structure.

17.7.5 Anyone rigging or dismantling scaffolding should have received adequate training.

17.7.6 Measures, such as adequate safety rails, should be incorporated to prevent the risk of persons or objects falling off.

17.7.7 Care must be taken to ensure that the safe working load of the structure is not exceeded.

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Annex 17.4 Requirements for scaffolding

1. Strength and stability calculations for scaffolding shall be carried out unless:
    - a note of the calculations, covering the structural arrangements contemplated, is available; or
    - the scaffolding is assembled in conformity with a generally recognised standard configuration.
2. Depending on the complexity of the scaffolding chosen, an assembly, use and dismantling plan shall be drawn up by a competent person. This may be in the form of a standard plan, supplemented by items relating to specific details of the scaffolding in question.
3. A copy of the plan, including any instructions it may contain, shall be made available for the use of the person supervising and the seafarers concerned in the assembly, use, dismantling or alteration of the scaffolding.
4. The bearing components of the scaffolding shall be prevented from slipping by:
    - attachment to the bearing surface;
    - provision of an anti-slip device; or
    - any other arrangement of equivalent effectiveness.
5. The load-bearing surface of the scaffolding shall be of sufficient capacity.
6. The scaffolding shall be positioned to ensure its stability.
7. Wheeled scaffolding shall be prevented by appropriate devices from moving accidentally during work at height.
8. The dimensions, form and layout of scaffolding decks shall:
    - be appropriate to the nature of the work to be performed;
    - be suitable for the loads to be carried; and
    - permit work and passage in safety.
9. Scaffolding decks shall be assembled in such a way that their components are prevented from moving inadvertently during work at height.
10. There shall be no dangerous gaps between the scaffolding deck components and the vertical collective safeguards to prevent falls.

11. When any part of a scaffold is not available for use, including during the assembly, dismantling or alteration of scaffolding, it shall be:

    - marked with general warning signs in accordance with the Merchant Shipping and Fishing Vessels (Safety Signs and Signals) Regulations 2001; and
    - suitably delineated by physical means preventing access to the danger zone.

12. Scaffolding shall be assembled, dismantled or significantly altered only under the supervision of a competent person and by seafarers who have received appropriate and specific training in the operations envisaged in accordance with regulation 12 of the Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 No. 2962 and regulation 11 of the Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) Regulations 2006 No. 2183, which shall include:

    - understanding the plan for the assembly, dismantling or alteration of the scaffolding;
    - safety during the assembly, dismantling or alteration of the scaffolding;
    - measures to prevent the risk of persons or objects falling;
    - safety measures in the event of changing weather conditions that could adversely affect the safety of the scaffolding;
    - permissible loads; and
    - any other risks that the assembly, dismantling or alteration of the scaffolding may entail.

    In addition:

    - appropriate procedures for conducting testing as necessary; and
    - avoid combining old and new components where possible, with regular testing where the compatibility of parts may be at question.

13. For the purposes of this annex, 'competent person' means the person possessing the knowledge or experience necessary for the performance of the duties imposed on that person by this annex.

CHAPTER 20

WORK ON MACHINERY AND POWER SYSTEMS

20.1 Introduction

20.1.1 Based on the findings of the risk assessment, before any maintenance work is carried out, appropriate control measures should be put in place to protect those seafarers concerned and others who may be affected. This chapter identifies some areas that may require attention.

20.2 General

20.2.1 No maintenance work or repair that may affect the supply of water to the fire main or sprinkler system should be started without the prior permission of the master and chief engineer.

20.2.2 No alarm system should be isolated without the permission of the master and chief engineer.

20.2.3 Means of access to firefighting equipment, emergency escape routes and watertight doors should never be obstructed.

20.2.4 Safety guards on machinery or equipment should only be removed when the machinery is not operating. If removal is essential for maintenance or examination of the equipment, the following precautions should be taken:

- Removal should be authorised by a responsible person, and only a competent person should carry out the work or examination.
- There should be adequate clear space and lighting for the work to be done.
- Anyone working close to the machinery should be told what the risks are and instructed in safe systems of work and precautions to take.
- A warning notice should be conspicuously posted.

20.2.5 Whenever floor plates or handrails are removed, warning notices should be posted, the openings should be effectively fenced or guarded and the area well illuminated. Floor plates and handrails should be secured in place on completion of the work being undertaken.

20.2.6 Lifting handles should be used when a floor plate is removed or replaced. When lifting handles are not provided, the plate should be levered up with a suitable tool and a chock inserted before lifting. On no account should fingers be used to prise up the edges.

20.2.7 Solvents used for cleaning can be toxic and they should always be used in accordance with the manufacturer's instructions. The area should be well ventilated, and smoking prohibited.

20.3 Work in machinery spaces

S.I. 2006/2183 and MGN 331(M+F) Amendment 1

20.3.1 Every dangerous part of a ship's machinery or other equipment should have guards or protection devices to prevent access to danger zones or to halt movements of dangerous parts before the danger zones are reached. Guidance is given in marine guidance note MGN 331(M+F) Amendment 1.

SOLAS II-2 Reg. 4.2.2.6

20.3.2 All steam pipes, exhaust pipes and fittings, which by their location and temperature present a hazard, should be adequately lagged or otherwise shielded. The insulation of hot surfaces should be properly maintained, particularly in the vicinity of oil systems. This can be monitored through thermographic survey or the use of infra-red thermometers to ensure that surface temperatures do not exceed 220°C.

20.3.3 Seafarers required to work in machinery spaces that have high noise levels should wear suitable hearing protection (see section 8.6).

20.3.4 Where a high noise level in a machinery space, or the wearing of ear protectors, may mask an audible alarm, a visual alarm of suitable intensity should be provided, where practicable, to attract attention and indicate that an audible alarm is sounding. This should preferably take the form of a light or lights with rotating reflectors. Guidance may be found in the International Maritime Organization (IMO) Code on Alerts and Indicators.

20.3.5 The source of any oil leakage should be located and repaired as soon as practicable.

S.I. 2019/42

20.3.6 Waste oil should not be allowed to accumulate in the bilges or on tank tops. Any leakage of fuel, lubricating or hydraulic oil should be disposed of in accordance with The Merchant Shipping (Prevention of Oil Pollution) Regulations 2019 at the earliest opportunity. Tank tops and bilges should, wherever practicable, be painted a light colour and kept clean and well illuminated in the vicinity of pressure oil pipes so that leaks may be readily located.

20.3.7 Extreme caution is required when filling any settling or other oil tank to prevent it overflowing, especially in an engine room where exhaust pipes or other hot surfaces are directly below. Manholes or

20.8.6 Before the main engine is restarted, a responsible engineer officer should check that the shaft is clear and inform the duty deck officer who should confirm that the propeller is clear.

20.9 Refrigeration machinery and refrigerated compartments

20.9.1 No one should enter a refrigerated chamber for maintenance activities without first informing a responsible officer.

20.9.2 Seafarers charging or repairing refrigeration plants should fully understand the precautions to be observed when handling the refrigerant. Adequate information should be available on each vessel, laying down the operation and maintenance safeguards of the refrigeration plant, the particular properties of the refrigerant and the precautions for its safe handling.

20.9.3 The compartment or flat in which refrigeration machinery is fitted should be adequately ventilated and illuminated. Where fitted, both the supply and exhaust fans to and from compartments in which refrigeration machinery is situated should be kept running at all times. Inlets and outlets should be kept unobstructed. When there is any doubt as to the adequacy of the ventilation, a portable fan or other suitable means should be used to assist in the removal of toxic gases from the immediate vicinity of the machine.

20.9.4 Should it be known or suspected that the refrigerant has leaked into any compartments, no attempt should be made to enter those compartments until a responsible officer has been advised of the situation. If it is necessary to enter the space, the procedures for entry into dangerous (enclosed) spaces should be followed (see Chapter 15, Entering dangerous (enclosed) spaces).

20.9.5 When refrigerant plants are being charged through a charging connection in the compressor suction line, it is sometimes the practice to heat the cylinder to evaporate the last of the liquid refrigerant. This should only be done by placing the cylinder in hot water or some similar indirect method and never by heating the cylinder directly with a blow lamp or other flame. Advice on the handling and storage of gas cylinders is given in section 24.9.

20.9.6 If it is necessary for repair or maintenance to apply heat to vessels containing refrigerant, appropriate valves should be opened to prevent build-up of pressure within the vessels.

20.10 Steering gear

20.10.1 Generally, work should not be done on steering gear when a ship is under way. If it is necessary to work on steering gear when the vessel is at sea, the ship should be stopped and suitable steps taken to immobilise the rudder by closing the valves on the hydraulic cylinders or by other appropriate and effective means.

20.11 Hydraulic and pneumatic equipment

20.11.1 Before repairs to or maintenance of hydraulic and pneumatic equipment is undertaken, any load should be removed or, if this is not practical, adequately supported by other means. All pressure in the system should be released. The part being worked upon should be isolated from the power source and a warning notice displayed by the isolating valve, which should be locked.

20.11.2 Precautions should be taken against the possibility of residual pressure being released when unions or joints are broken.

20.11.3 Absolute cleanliness is essential for the proper and safe operation of the hydraulic and pneumatic system; the working area and tools, as well as the system and its components, should be kept clean during servicing work. Care should also be taken to ensure that replacement units are clean and free from any contamination, especially fluid passages.

20.11.4 Only replacement components that comply with manufacturers' recommendations should be used. Any renewed or replacement item of equipment should be properly inspected or tested before being put into operation within the system.

20.11.5 Since vapours from hydraulic fluid may be flammable, naked lights should be kept away from hydraulic equipment that is being tested or serviced.

20.11.6 A jet of hydraulic fluid under pressure should never be allowed to spray onto parts of the body. If a person is subjected to hydraulic fluid under high pressure on unprotected skin, immediate medical assistance should be sought. Any hydraulic fluid spilt on the skin should be thoroughly washed off.

20.12 Electrical equipment

20.12.1 The risks of electric shock are much greater on board ship than they are normally ashore because wetness, high humidity and high temperature (including sweating) reduce the contact resistance of the body. In those conditions, severe and even fatal shocks may be caused

at voltages as low as 60V. It should also be borne in mind that cuts and abrasions significantly reduce skin resistance.

20.12.2 A notice of instructions on the treatment of electric shock should be posted in every place containing electrical equipment and switchgear. Immediate on-the-spot treatment of an unconscious patient is essential.

20.12.3 Before any work is done on electrical equipment, fuses should be removed or circuit breakers opened to ensure that all related circuits are dead. If possible, switches and circuit breakers should be locked open or, alternatively, a 'not to be closed' notice attached. Where a fuse has been removed, it should be retained by the person working on the equipment until the job is finished. A check should be made that any interlocks or other safety devices are operative. The work should be carried out by, or under the direct supervision of, a competent person with sufficient technical knowledge and a permit to work system should be operated. Additional precautions are necessary to ensure safety when work is to be undertaken on high-voltage equipment (designed to operate at a nominal system voltage in excess of 1000V).

20.12.4 Some parts of certain types of equipment may remain live even when the equipment is switched off. Power should always be cut off at the mains.

20.12.5 Flammable materials should never be left or stored near switchboards.

20.12.6 Work on or near live equipment should be avoided if possible but when it is essential for the safety of the ship or for testing purposes, the following precautions should be taken:

- A second person, who should be competent in the treatment of electric shock, should be continually in attendance.
- The working position adopted should be safe and secure to avoid accidental contact with the live parts. Insulated gloves should be worn where practicable.
- Contact with the deck, particularly if it is wet, should be avoided. Footwear may **not** give adequate insulation if it is damp or has metal studs or rivets. The use of a dry insulating mat at all times is recommended.
- Contact with bare metal should be avoided. A hand-to-hand shock is especially dangerous. To minimise the risk of a second contact should the working hand accidentally touch a live part, one hand should be kept in a trouser pocket whenever practicable.

- Wrist watches, metal identity bracelets and rings should be removed. They provide low-resistance contacts with the skin. Metal fittings on clothing or footwear are also dangerous.

20.12.7 Any test meters (and their associated leads/probes) used should be rated for the voltage and/or current being tested with meter probes having only minimum amounts of metal exposed and insulation of both probes should be in good condition. Care should be taken that the probes do not short circuit adjacent connections. When measuring voltages that are greater than 250V, the probe should be attached and removed with the circuit dead.

20.12.8 The conducting tips of probes should have a maximum dimension of 4mm (and where possible 2mm or less and/or fitted with a retractable shield). Leads should be flexible and of sufficient length for the purpose but not so long as to be unwieldy. Meter sockets and lead plugs should not allow any possibility of finger contact being made with the conductor should the lead become detached from the socket.

20.12.9 Good practice should be followed and all seafarers should be made aware of the potential dangers in the space in which they are working. The test equipment should be suitable for the system under examination, checked for damage before use, and proved to be operational before and after use.

20.13 Main switchboards

20.13.1 The internal cleaning and maintenance of the main switchboard must only be carried out while it is in a 'dead' condition; after a full risk assessment has been carried out, as described in Chapter 1, Managing occupational health and safety, and a formal permit to work issued, as described in Chapter 14, Permit to work systems.

20.13.2 The risk assessment will identify the actions and checks required to make the switchboard safe, and these actions and checks will be identified in the permit to work. The major checks to be listed on the permit to work will identify and verify that the necessary inter-connections to and from, and/or within, the main switchboard are disconnected. These will include but are not limited to:

- the shore power supply;
- the emergency generator; and
- the emergency power supply.

20.13.3 The internal cleaning and internal maintenance of the main switchboard would, in general, be an integral part of a ship's dry-dock programme or that of an extended maintenance programme.

20.14 High-voltage systems

20.14.1 Additional precautions are necessary to ensure safety when work is to be undertaken on high-voltage equipment (designed to operate at a nominal system voltage in excess of 1000V).

20.14.2 Definitions

The following list defines the terms used with respect to the high-voltage equipment/installations.

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CHAPTER 21

HAZARDOUS SUBSTANCES AND MIXTURES

21.1 General advice

21.1.1 Many substances and mixtures found on ships are capable of damaging the health and safety of those exposed to them. They include not only substances displaying hazard-warning labels (particularly those declared as dangerous goods in ships' stores) but also, for example, a range of dusts, including hardwood dusts, fumes and fungal spores from goods, plant or activities aboard ship.

21.1.2 This chapter deals with the use of hazardous substances and mixtures (referred to in this chapter as 'hazardous substances') carried on board ships, e.g. in a ship's stores. Dangerous substances carried as cargo are covered in the relevant sections of Chapter 28, Dry cargo, and Chapter 29, Tankers and other ships carrying bulk liquid cargoes.

21.1.3 A hazard-warning label includes a pictogram, a precautionary statement, a hazard statement (e.g. carcinogenic, flammable) and, where required, a signal word (either 'Danger' or 'Warning'). Seafarers should familiarise themselves with the meaning of such labels.

21.1.4 The Company's risk assessment will identify where seafarers are working in the presence of hazardous substances, and evaluate any risks from exposure. Appropriate measures should be taken to remove, control or minimise the risk. It is essential before use of any hazardous substance that the manufacturer's safety data sheet (SDS) is referred to, to select appropriate personal protective equipment (PPE) and working methods.

21.1.5 The Company should instruct and inform seafarers so that they know and understand the risks arising from their work and the precautions to be taken. Employers should inform seafarers of the results of any monitoring of exposure.

21.1.6 Where possible, seafarers should avoid direct contact with hazardous substances, wear appropriate gloves and if necessary safety glasses/goggles, and follow the manufacturer's instructions.

21.1.7 The Company should instruct seafarers to take appropriate precautions and make them aware of the potentially hazardous by-products that may be produced from mixing hazardous substances

together, e.g. mixing chlorine-based toilet cleaner with de-scaler will evolve a hazardous gaseous by-product, which may result in an asphyxiating, explosive or other hazardous atmosphere.

21.1.8 The risk assessment will also provide information to determine whether health surveillance is appropriate as a result of exposure to hazardous substances. Advice can be found in Chapter 7, Health surveillance.

21.1.9 As an aid to the identification of hazards and the assessment of risks from hazardous substances, reference may be made to the SDS, which in Europe the manufacturer is required to supply with hazardous substances and mixtures.

21.1.10 For more specialist advice relating to particular work activities, reference may also be made where appropriate to the series of publications issued by the Health and Safety Executive (HSE) under the Control of Substances Hazardous to Health (COSHH) Regulations (see Appendix 2, Other sources of information).

21.2 Carcinogens and mutagens

S.I. 2007/3100 and MGN 356(M+F)

21.2.1 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Carcinogens and Mutagens) Regulations 2007 (the 2007 Regulations) specifically require that the risk assessment considers the risk arising from exposure to carcinogens and mutagens. A carcinogen is a substance or mixture for which evidence exists to establish a link between exposure to it and the development of cancer, and a mutagen is a substance or mixture for which evidence exists to establish a link between exposure to it and heritable genetic damage.

21.2.2 Hazardous substances that are found on ships and considered carcinogens and mutagens include:

- aflatoxins;
- arsenic;
- asbestos (see section 21.4);
- hardwood dusts;
- rubber dust and rubber fumes;
- used engine oils; and
- welding fumes (see Chapter 24, Hot work).

21.2.3 The supplier of a hazardous substance or mixture is required to:

- identify the hazards of the substance or mixture;

- provide information about the hazards to their customers. This information is usually provided on the package itself (e.g. by means of a hazard label) and, if supplied for use at work, in a SDS; and
- package the chemical safely (classification of carcinogens is described in Annex 21.1).

The hazard information should be used to help the Company comply with the 2007 Regulations.

21.2.4 Where the risk assessment reveals a risk to seafarers' health from carcinogens and mutagens, and the measures set out in section 21.3 do not result in the complete removal of that risk, the Company should ensure that in no circumstances does the exposure exceed the limit values set out in the regulations.

21.2.5 All cases of cancer that can be identified as resulting from occupational exposure to a carcinogen or mutagen, and have been confirmed in a report from a doctor, are required to be reported to the Maritime and Coastguard Agency (MCA). (See Chapter 7, Health surveillance, on the reporting of occupational diseases.)

21.3 Prevention or control of exposure

21.3.1 The first consideration should always be to prevent exposure by removing the substance, e.g. by substituting a less harmful one.

21.3.2 Where this is not reasonably practicable, prevention or control of exposure may be achieved by any combination of the following means:

- Total or partial enclosure of the process and handling systems.
- Using plant, processes and systems of work, which minimise the generation of, or suppress and contain/prevent, spills, leaks, dust fumes and vapours of hazardous substances.
- Local exhaust ventilation (to remove toxic fumes and, therefore, limit exposure).
- Limiting the quantities of a substance at the place of work.
- Keeping the number of persons who might be exposed to a substance to a minimum, and reducing the period of exposure.
- Prohibiting eating, drinking and smoking in areas that may be contaminated by the substance.
- Hygiene measures, including providing adequate washing and laundering facilities, and regular cleaning of walls/bulkheads and other surfaces.

- Designation of those areas that may be contaminated and the use of suitable and sufficient warning signs.
- Safe storage, handling and disposal of hazardous substances and use of closed and clearly labelled containers.
- Using appropriate procedures for the measurement of hazardous substances, in particular for the early detection of abnormal exposures resulting from an unforeseeable event or an accident.
- Taking individual/collective protection measures.
- Where appropriate, drawing up plans to deal with emergencies likely to result in abnormally high exposure.

21.3.3 These measures should be applied to reduce the risk to seafarers to the minimum, but where they do not adequately control the risk to health, PPE should be provided in addition.

21.3.4 The Company should take reasonable steps to ensure that any control measures are properly used and maintained. Where appropriate, exposure levels should be monitored and recorded. For some hazardous substances, seafarers must not be subject to exposure at work beyond a statutory level. These workplace exposure limits are published by HSE in the publication, 'EH40/2005 Workplace exposure limits', available on the HSE website.

21.3.5 Seafarers should comply fully with the control measures in force.

21.3.6 For certain substances (e.g. asbestos and benzene), very specific control measures apply. In cases where failure of the control measures could result in risk to health and safety, the exposure of personnel should be monitored and a record kept for future reference.

21.3.7 Where the adequacy or efficiency of control measures is in doubt, work should not be undertaken until outside advice is sought and action taken proportionate to the risks involved.

21.4 Asbestos dust

S.I. 2010/2984, MGN 429(M+F) and MGN 493(M+F)

21.4.1 The use of asbestos in ship construction has been banned internationally, but cases of its use are still being discovered in non-approved parts such as gaskets and brake linings. Caution should be exercised when obtaining spare parts, because some components may contain asbestos even when declared 'asbestos free'. Measures to protect seafarers' health where there is a risk of exposure to asbestos are in the Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Asbestos) Regulations 2010 and associated marine guidance notes (MGNs).

21.4.2 All types of asbestos have a fibrous structure and can produce harmful dust if the surface exposed to the air is damaged or disturbed. The danger is not immediately obvious because the fibres that can damage the lungs and cause lung cancer are too small to be seen with the naked eye. Asbestos that is in good condition is unlikely to release fibres, but where the material is damaged or deteriorating, or work is undertaken on it, airborne fibres can be released. Dry asbestos is much more likely to produce dust than asbestos that is thoroughly wet or oil-soaked. Asbestos is particularly likely to occur on older vessels in insulation and panelling, but certain asbestos compounds may also be found elsewhere and on other vessels in machinery components such as gaskets and brake linings.

21.4.3 The Company should advise masters of any location where asbestos is known or believed to be present on their ship. Masters and/or safety officers should keep a written record of this information and should also note any other position where asbestos is suspected, but they should not probe or disturb any suspect substance. Crew members who work regularly near asbestos or a substance likely to contain it should be warned of the need for caution and should report any deterioration in its condition such as cracking or flaking.

21.4.4 The condition of old asbestos may deteriorate and where reasonably practicable consideration should be given to its removal. This should be carried out in port and a specialist removal contractor should be used to ensure adequate protective procedures. Where the port is in the UK and the work involves asbestos insulation or asbestos coating, it is usually necessary for the contractor to hold a licence issued by HSE. If such work is carried out outside the UK, the contractor should be of equivalent competence.

21.4.5 If it is essential to carry out emergency repairs liable to create asbestos dust while the ship is at sea, strict precautions, including the use of the appropriate protective clothing and respiratory protective equipment, should be observed in accordance with the guidance given in the relevant merchant shipping notice (MSN). See also the general guidance on the assessment and control of risks from hazardous substances in section 3.11 of this Code.

21.4.6 Where asbestos or asbestos-containing materials are carried as a cargo, generally in shipping containers, extreme caution should be exercised so as to prevent exposure.

21.5 Use of chemical agents

S.I. 2010/330, MGN 409(M+F) and MGN 454(M+F)

21.5.1 Relevant MGNs give further guidance on the handling of chemicals and should be consulted. Particular emphasis is given to health monitoring for those exposed to chemicals (see Chapter 7, Health surveillance).

European regulation (EC) 1272/2008

21.5.2 A chemical from an unlabelled package or receptacle should never be used unless its identity has been positively established. In addition to transport labelling, packaged substances supplied in Europe may also display similar or additional labelling for supply and use for compliance with the European regulation on classification, labelling and packaging of substances and mixtures ('the CLP Regulation').

21.5.3 Employers should ensure workers are instructed to familiarise themselves with the accompanying data sheet for any chemical agents they may use in the course of their work. They should also be aware of the potentially hazardous gaseous by-products that may be produced from the reaction of a cleaner/de-scaling product and the object itself, or products used together, because this may result in an asphyxiating, explosive or other hazardous atmosphere.

21.5.4 Chemicals should always be handled with the utmost care. Industrial formulations may be stronger. Eyes and skin should be protected from accidental exposure or contact.

21.5.5 Manufacturers' or suppliers' advice on the correct use of chemicals should always be followed. Some cleaning agents (e.g. caustic soda and bleaches), even though used domestically, may burn the skin. The product's hazard-warning label should identify where skin corrosion/serious eye damage hazards are present. Instructions on handling such chemicals safely will be made clear in the precautionary statements.

21.5.6 Chemicals should not be mixed unless it is known that no dangerous reaction will be caused.

21.5.7 Employers should ensure that any necessary training in the use of chemicals is given.

21.6 Dry-cleaning operations

21.6.1 The principal hazard presented by a dry-cleaning solvent is that it is highly volatile, producing a vapour that is anaesthetic. Effective mechanical ventilation should therefore be provided in any compartment containing dry-cleaning plant. Smoking should be prohibited in compartments when the solvent is present.

21.6.2 Dry-cleaning solvent is also a potential cause of skin damage and suitable PPE should be worn.

21.6.3 A competent person should be appointed to take overall responsibility for the security and operation of the dry-cleaning plant and access should be controlled.

21.7 Safe use of pesticides

S.I.1999/336, MSN 1718(M) and MGN 576(M)

21.7.1 The following guidance should be read in conjunction with MSN 1718(M) and MGN 576(M), which have mandatory force under the Merchant Shipping (Carriage of Cargoes) Regulations 1999.

MSC.1/Circ.1264

21.7.2 Where pesticides are used in the cargo spaces of ships or cargo units, safety procedures should be in accordance with the International Maritime Organization (IMO) publication, MSC.1/Circ.1264, and a copy of this publication should be retained on board and kept accessible for all crew members.

MSC.1/Circ.1358

Where pesticides are used in other spaces of ships, safety procedures should be in accordance with MSC.1/Circ.1358.

21.7.3 Where space and surface-spraying operations are being carried out by the crew, the master should ensure that the appropriate protective clothing, gloves, respirators and eye protection are being worn.

21.7.4 The ship's personnel should not handle fumigants and such operations should be carried out only by qualified operators. Fumigation should only be carried out with the authority of the ship's master. (Health and safety guidance on fumigation can be found in the HSG251 publication, which is available from the HSE website.)

21.7.5 In exceptional circumstances, the master may choose to allow an in-transit fumigation only after first referring to the requirements of the ship's own national administration, and seeking the approval of the administration of the state of the vessel's next destination or port of call. The master should provide safe working conditions and ensure that at least two members of the crew, including one certificated officer, have received the appropriate training. They should be familiar with the recommendations of the fumigant manufacturer concerning the methods of detection of the fumigant in air, its behaviour and hazardous properties, symptoms of poisoning, relevant first-aid treatment and special medical treatment and emergency procedures.

21.7.6 The 'fumigation warning' sign should be conspicuously displayed on cargo units or spaces under fumigation. A watchman should be posted to prevent access to areas of risk by unauthorised personnel.

21.8 Biological agents

S.I. 2010/323 and MGN 408(M+F)

21.8.1 The following guidance should be read in conjunction with MGN 408(M+F) on biological agents. Biological agents are classified in groups 1 to 4. These groups are defined in Annex 21.1.

21.8.2 In excess to the guidance given above, employers are required to keep a list of those exposed to biological agents of group 3 or higher.

21.8.3 Any worker involved with the handling of, or being exposed to, biological agents should be given appropriate training and advice.

21.8.4 Before any work is carried out, a risk assessment should be carried out and procedures put in place for any potential accident to minimise its effects.

21.8.5 The most likely areas for contamination by biological agents are from the following:

- food preparation;
- contact with animals and/or products of animal origin;
- health care;
- work with air-conditioning and water-supply systems; and
- work involving waste disposal and the sewage plant.

21.9 Solid carbon dioxide

21.9.1 Solid carbon dioxide (drikold, cardice, dry ice) can be used as an emergency refrigerant for preserving deep frozen food supplies in their hard frozen condition.

21.9.2 The following precautions should be taken when solid carbon dioxide is used:

- Carbon dioxide does not diffuse readily, because it is heavier than air, therefore, special care should be taken to test the atmosphere thoroughly and ventilate such compartments/enclosed spaces before entering.
- The door of the compartments/enclosed spaces should remain open while the seafarer is inside the cold chambers/enclosed spaces.
- Gloves should always be worn when handling solid carbon dioxide to prevent blistering of the skin.

21.9.3 Chapter 15 gives guidance on entering dangerous (enclosed) spaces and the procedures that should be followed prior to entry and while inside.

CHAPTER 22

BOARDING ARRANGEMENTS

22.1 Introduction

S.I. 1997/2962

22.1.1 Safe means of access must be provided between the ship and the shore or another ship alongside to which the ship is secured. Providing safe access to and from a ship is considered to be an integral part of ensuring a safe working environment on board, as required by the Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997, regulation 5(2)(e). Following the principles and guidance in this chapter will generally be considered to demonstrate compliance with the duty to ensure a safe working environment on board ship. Where different measures are taken to provide a safe means of access, these alternative measures must provide at least an equivalent level of safety in the operating conditions at the time.

22.1.2 This chapter sets out general principles that must be complied with, and best practice guidance. It highlights some areas that may require attention in respect of boarding arrangements.

22.2 General principles

22.2.1 Arrangements for boarding should be provided that are fit for purpose, comply with the appropriate standards in this chapter and are properly maintained in accordance with section 22.7.

22.2.2 Gangways and accommodation ladders are to be considered as lifting equipment and should be tested and recorded as such.

IMO MSC.1/ Circ. 1331

22.2.3 Where the provision of equipment is necessary to ensure safe means of access, it must be placed in position promptly, be properly rigged and deployed, safe to use and adjusted as necessary to maintain safe access. Rigging equipment should not form a trip hazard. Ships should comply with inspection, testing and maintenance requirements.

22.2.4 The means of access should be inspected to ensure that it is safe to use after rigging. There should be further checks to ensure that adjustments are made when necessary due to tidal movements or change of trim and freeboard. Guard ropes, chains, etc. should be kept taut at all times and stanchions should be rigidly secured.

22.2.5 When access equipment is provided from the shore, it is still the responsibility of the master to ensure as far as is reasonably practicable that the equipment meets these requirements.

22.2.6 Any access equipment and immediate approaches to it must be adequately lit. For appropriate standards of lighting, see Chapter 11, Safe movement on board ship, Annex 11.2.

22.2.7 The means of boarding and its immediate approaches should be kept free from obstruction and, as far as is reasonably practicable, kept clear of any substance likely to cause a person to slip or fall. Where this is not possible, appropriate warning notices should be posted and if necessary the surfaces suitably treated.

22.2.8 Each end of a gangway or accommodation or other ladder should provide safe access to a safe place or to an auxiliary safe access.

22.2.9 A portable ladder should only be used for access to a ship when no safer access is reasonably practicable. A rope ladder should only be used between a ship with a high freeboard and a ship with a low freeboard or between a ship and a boat if no safer means of access is reasonable practicable.

22.2.10 A lifebuoy with a self-activating light and also a separate buoyant safety line attached to a quoit or some similar device must be provided ready for use at the point of access aboard the ship.

22.3 Safety nets

22.3.1 An adequate number of safety nets of a suitable size and strength are to be carried on the ship or otherwise be readily available. Where there is a risk of a person falling from the access equipment or from the quayside or ship's deck adjacent to the access equipment, a safety net must be mounted where reasonably practicable.

22.3.2 The aim of safety nets is to minimise the risk of injury arising from falling between the ship and the quay or falling onto the quay, deck or between two vessels. As far as is reasonably practicable, the whole length of the means of access should be covered. Safety nets should be securely rigged, with use being made of attachment points on the quayside where appropriate.

22.4 Use of equipment

S.I. 1997/2962

22.4.1 When suitable access equipment is provided from the ship or from the shore or from another ship, any person boarding or leaving the ship shall use that equipment.

22.5 Positioning of boarding equipment

22.5.1 The angles of inclination of a gangway or accommodation ladder should be kept within the limits for which it was designed.

22.5.2 When the inboard end of the gangway rests on or is flush with the top of the bulwark, a bulwark ladder should be provided. Any gap between the bulwark ladder and the gangway should be adequately fenced to a height of at least 1 metre.

22.5.3 Gangways and other access equipment should not be rigged on ships' rails unless the rail has been reinforced for that purpose. They should comply with the guidance in Annex 22.1.

22.5.4 The means of access should be sited clear of the cargo working area and so placed that no suspended load passes over it. Where this is not practicable, access should be supervised at all times.

22.5.5 When an accommodation ladder is being rigged, this should be completed with the ladder in the horizontal position so that those working on it can be safely attached with a safety line to the deck and the ladder secured to reduce any unnecessary movement.

22.5.6 During the rigging process, seafarers must maintain awareness of their safety, fence any gaps in the railing as per Annex 22.1 section 2.3 and follow guidance for working at height. (See also Chapter 17, Work at height.)

22.6 Portable and rope ladders

22.6.1 Where, exceptionally, a portable ladder is used for the purpose of access to the ship, it is very important that the ladder is checked regularly by a competent person, and that account is taken of vessel movement and tide changes.

22.6.2 When it is necessary to use a portable ladder for access, it should be used at an angle of 75° from the horizontal. The ladder should extend at least 1 metre above the upper landing place unless there are other suitable handholds. It should be properly secured against slipping, shifting sideways or falling and be so placed as to afford a clearance of at least 150 mm behind the rungs.

22.6.3 When a portable ladder is resting against a bulwark or rails, there should be suitable safe access to the deck.

22.6.4 A rope ladder should be secured to a certified fixing point, and never to rails or to any other means of support unless they are constructed for the purpose.

22.6.5 A rope ladder should be left in such a way that it either hangs fully extended from a securing point or is pulled up completely. It should not be left so that any slack will suddenly pay out when the ladder is used.

22.6.6 Where the freeboard is 9 metres or more, a rope ladder should only be used in conjunction with an accommodation ladder, leading aft and positioned in such a way as to provide safe and easy access from the rope ladder to the bottom platform.

22.7 Maintenance of equipment for means of access

SOLAS II.1/3-9 and MSC.1/Circ.1331

22.7.1 Any equipment used for boarding or for hoisting boarding equipment, including lifting wires, should be inspected by a competent person at appropriate intervals, properly maintained and parts renewed in accordance with the manufacturer's instructions. Additional checks should be made each time the equipment is rigged, looking out for signs of distortion, cracks or corrosion. Welding connections should be given particular attention in inspections.

22.7.2 Arrangements should be made to inspect the underside of gangways and ladders periodically. Any defects affecting the safety of any access equipment, including access provided by a shore authority, should be reported immediately to a responsible person and made good before further use.

22.7.3 Aluminium equipment should be examined for corrosion and fracture in accordance with the instructions in Annex 22.2.

22.7.4 All inspections, maintenance work and repairs should be recorded. The record should include the date of the most recent inspection, the name of the person or body carrying out the inspection, the due date for inspection and the dates for renewal of wires for supporting the equipment.

22.7.5 Gangways, accommodation ladders and winches used for lifting or access should be tested in the same way as all other lifting appliances and records maintained, including any test certificates.

22.8 Special circumstances

22.8.1 In some circumstances, it may not be practical to mount proper safe boarding arrangements by conventional means, e.g. where there is frequent movement of the ship during cargo operations, or where access is required between the ship and an offshore structure. On such occasions, boarding should be carefully supervised and consideration given to providing alternative means of access.

22.8.2 Further guidance on safe access to offshore structures is in Chapter 31, Ships serving offshore oil and gas installations.

22.8.3 Small boats or tenders used between the shore and the ship should be safe and stable for the expected conditions, suitably powered, correctly operated, properly equipped with the necessary safety equipment and, if not a ship's boat, approved for that purpose.

22.8.4 Where a vessel is moored alongside another vessel, there should be cooperation between the two vessels in order to provide suitable and safe boarding arrangements. Access should generally be provided by the ship lying outboard, except that, where there is a great disparity in freeboard, access should be provided by the ship with the higher freeboard.

22.8.5 Care should be taken at all times, but particularly at night, when boarding or leaving a ship, or when moving through the dock area. The edges of the docks, quays, etc. should be avoided and any sign prohibiting entry to an area should be strictly observed. Where there are designated routes they should be followed exactly. This is particularly important in the vicinity of container terminals or other areas where rail traffic, straddle carriers or other mechanical handling equipment is operating, because the operators of such equipment have restricted visibility, placing anyone walking within the working area at risk.

S.I. 2002/1473

22.8.6 Transfer of personnel between two unsecured ships at sea is potentially a particularly dangerous manoeuvre, and should be avoided where possible. Where such a manoeuvre is unavoidable, a risk assessment of the transfer arrangements should be undertaken and appropriate safety measures put in place to ensure the safety of those involved. Both vessels should be properly equipped and/or modified to allow the boarding to be undertaken without unnecessary risk. A proper embarkation point should be provided, and the boarding procedure clearly agreed. The relative movements of both vessels in any seaway and varying sea, tide and swell conditions make the judgement of when to effect a transfer crucial. The master responsible for the transfer operation should have full sight of the area of transfer and, with at least one designated crew member, be able to communicate at all times with the crew member making the transfer. It is recommended that vessels undertaking ship-to-ship transfers while under way should carry equipment designed to aid in the rapid recovery of a casualty from the waters.

22.8.7 A working lifejacket should be donned when there is a risk of falling into the water when transferring to a vessel or structure that is not alongside. The transfer of baggage or other items should be done by the crews of the vessels and not by those boarding.

22.9 Access for pilots

S.I. 2002/1473 and MSN 1874(M+F) Amendment 2, IMO Resolution A.1045(27) as amended and BS ISO 799-1:2019

22.9.1 The Company is required to provide pilot ladders and accommodation ladders that comply with the construction and testing requirements laid out in SOLAS Chapter V, regulation 23 as amended. Guidance on these standards is included in Annex 22.1.

22.9.2 In addition, the master must ensure the following:

- All pilot ladders used for pilot transfer should be clearly identified with tags or other permanent marking so as to enable identification of each appliance for the purposes of survey, inspection and record keeping. A record should be kept on the ship as to the date the identified ladder is placed into service and any repairs effected.
- Each pilot ladder, accommodation ladder and their associated equipment are properly maintained and stowed, and regularly inspected to ensure that, so far as is reasonably practicable, each is safe to use.
- Each pilot ladder is used only for the embarkation and disembarkation of pilots and by officials and other persons while a ship is arriving at or leaving a port.
- The rigging of the pilot ladder, accommodation ladder and associated equipment is supervised by a responsible officer who is in communication with the navigating bridge. This officer's duties will include arranging for the pilot to be escorted by a safe route to and from the bridge. Advice on safe rigging of such equipment is included in this chapter (see section 22.10).
- Personnel engaged in rigging or operating any mechanical equipment are instructed in the safe procedures to be adopted and that the equipment is to be tested prior to each use.

22.9.3 A safety line and harness for those rigging the pilot ladder, a lifebuoy with a self-igniting light, and a heaving line should be kept at hand ready for use at the point of boarding.

22.9.4 The pilot ladder, accommodation ladder and the position where the person embarks and disembarks on the ship should be adequately lit.

MGN 301(M+F)

22.9.5 It is very important that the ship offers a proper lee to the pilot boat. The arrangements for boarding should preferably be sited as near amidships as possible, but in no circumstances should they be in a position that could lead to the pilot boat running the risk of passing underneath overhanging parts of the ship's hull structure. Further information is contained in marine guidance note MGN 301(M+F).

22.10 Safe rigging of pilot ladders

22.10.1 In addition to the general points in section 22.2, in order to minimise the danger to pilots when boarding and leaving ships, particular attention should be given to the following points:

- Pilot ladders should be rigged in such a manner that the steps are horizontal, and such that the lower end is at a height above the water to allow ease of access to and from the attendant craft.
- The ladder should rest firmly against the side of the ship.
- When an accommodation ladder is used in conjunction with a pilot ladder, the pilot ladder should extend at least 2 metres above the bottom platform.
- Safe, convenient and unobstructed access should be provided to anyone embarking or disembarking between the ship and the head of the pilot ladder.
- A lifebuoy with self-igniting light should be kept available at the point of access to the ship.
- At night, the pilot ladder and ship's deck should be lit by a forward-shining, overside light.
- The top of the pilot ladder should be secured to the certified fixed point and not to handrails. Ladder steps or spacers should not be rigged in a position in which they are taking the weight of the ladder.
- Care should be taken to ensure that steps and spacers do not become entrapped or twisted.

See the 'Required boarding arrangements for pilot' diagram on the International Maritime Pilots' Association website, which is listed in Appendix 2, Other sources of information, of this Code.

22.11 Safe access to small craft

22.11.1 Ports and harbours may not have areas specifically designed to ensure safe access to and from small vessels. In determining how access will be provided, it is good practice to consider each of the options below, starting with gangways before moving to the next level. The most suitable means of access should be identified by risk assessment, considering which safety measures are required.

22.11.2 All these methods for gaining access to small craft can be used safely providing appropriate safety measures are taken.

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22.11.3 The industry's recommended hierarchy of access arrangements for small craft, starting with the safest first, is as follows:

- Gangway between small craft and the quay, quay steps, quay wall, pier or other vessel/small craft.
- Stepping directly (short step, level access) between the small craft and the quay, quay steps, quay wall, pier, other vessel/small craft or pontoon.
- Fixed ladder from the quay, quay wall, pier or jetty.
- Portable ladder between the small craft and the quay, quay wall, pier or jetty.

Annex 22.1 Standards for means of access

1. General

ISO 5488:1979, ISO 7061:1993 MSC.1/Circ.1331

BS MA 89:1980

1.1 Accommodation ladders and gangways should comply with appropriate international standards such as ISO 5488:1979 Shipbuilding – accommodation ladders and ISO 7061:1993 Shipbuilding – aluminium shore gangways for seagoing vessels.

1.2 The structure of accommodation ladders and gangways and their fittings should allow regular inspection and maintenance of all parts and, where necessary, lubrication of their pivot pin. Each accommodation ladder or gangway should be clearly marked at each end with a plate showing any restrictions on safe operation or loading including minimum and maximum permitted design angles or inclination, design load and maximum load on the bottom end plate. Where the maximum operating load is less than the design load, that should also be shown on the marking plate.

1.3 Gangways should be carried on ships of 30 metres in length or over and accommodation ladders must be carried on ships of 120 metres in length or over, complying with the specifications in section 2. Access equipment must be of good construction, sound material and adequate strength, free from patent defect and properly maintained. Rope ladders must comply with the requirements in section 4.

1.4 Gangways and accommodation ladders must be clearly marked with the manufacturer's name, the model number, the maximum designed angle of use and the maximum safe loading, both by numbers of persons and by total weight.

2. Gangways

BS MA 78:1978

2.1 Gangways must comply with the specifications set out in standard BS MA 78:1978 or equivalent, and should be fitted with suitable fencing along their entire length.

2.2 They should not be used at an angle of more than 30° from the horizontal, unless designed and constructed for use at greater angles.

2.3 Gangways should not be fixed to the ship's railings unless designed for such use. If rigged in an open section in the ship's bulwark or railings, any remaining gaps should be adequately fenced.

3. Accommodation ladders

3.1 An accommodation ladder should be designed so that:

- it rests firmly against the side of the ship where practicable;
- the angle of slope is no more than 55°. Treads and steps should provide a safe foothold at the angle at which the ladder is used;

BA MA 39, Part 2: 1973

- it is fitted with suitable fencing (preferably rigid handrails) along its entire length, except that fencing at the bottom platform may allow access from the outboard side;

SOLAS III/3.13

- at a maximum inclination, the lowest platform of the ladder is no more than 600 mm above the waterline in the lightest seagoing conditions;
- the bottom platform is horizontal, and any intermediate platforms are self-levelling;
- it provides direct access between the head of the ladder and the ship's deck by a platform securely guarded with guardrails and adequate handholds;
- it can easily be inspected and maintained; and
- it is rigged as close to the working area but clear of any cargo operations as possible.

ISO 7364:1983

3.2 After installation, the winch and ladder should be operationally tested to confirm proper operation and condition of the winch and ladder after the test. This test should include raising and lowering the accommodation ladder at least twice (e.g. ISO 7364:1983). Records should be maintained, including any test certificates.

3.3 When a bulwark ladder is to be used, it must comply with the specifications set out in the Shipbuilding Industry Standard No. SIS 7 or BS MA 39, Part 2:1973 Specification for ships' ladders, or be of an equivalent standard. Adequate fittings must be provided to enable the bulwark ladder to be properly and safely secured.

4. Pilot ladders

SOLAS Chapter V.23, S.I. 2002/1473, MSN 1874(M+F) Amendment 2, as amended, and BS ISO 799-1:2019

4.1 A rope ladder must be of adequate width and length and so constructed that it can be efficiently secured to the ship.

- The steps must provide a slip-resistant foothold of not less than 400 mm × 115 mm × 25 mm and must be so secured that they are firmly held against twist, turnover or tilt.
- The steps must be horizontal and equally spaced at intervals of 310 mm (± 5mm).

- The side ropes, which should be a minimum of 18 mm in diameter, should be equally spaced.
- There should be no shackles, knots or splices between rungs.
- Ladders of more than 1.5 metres in length must be fitted with spreaders not less than 1.8 metres long. The lowest spreader must be on the fifth step from the bottom and the interval between spreaders must not exceed nine steps. The spreaders should not be lashed between steps.

4.2 New or replacement pilot ladders installed on or after 1 July 2012 should be certified by the manufacturer as being compliant with international standards and duly marked as being Marine Equipment Directive (MED) approved (EC Directive 96/98/EC of 20 December 1996 on marine equipment as amended). Merchant shipping notice MSN 1874(M+F) Amendment 2, as amended provides more information. A pilot ladder (conforming to BS ISO 799-1:2019) can be accepted provided that it meets the regulation requirements.

4.3 In addition to the standards above, every pilot ladder should be positioned and secured so that:

- it is clear of any possible discharges from the ship;
- it is, where practicable, within the mid-ship half-section of the ship (but see section 22.9.5);
- it can rest firmly against the ship's side; and
- the person climbing it can safely and conveniently board the ship after climbing no more than 9 metres.

4.4 Where replacement steps are fitted, they should be secured in position by the method used in the original construction of the ladder. No pilot ladder should have more than two replacement steps secured in position by a different method. Where a replacement step is secured by means of grooves in the sides of the step, such grooves should be in the longer sides of the step.

4.5 Two man-ropes of not less than 28 mm in diameter, properly secured to the ship, should be provided.

4.6 Where access to the ship is by a gateway in the rails or bulkhead, adequate handholds should be provided. Shipside doors used for this purpose should not open outwards.

4.7 Where access is by bulwark ladder, the ladder should be securely attached to the bulwark rail or landing platform. Two handhold stanchions should be provided, between 700 mm and 800 mm apart,

each of which should be rigidly secured to the ship's structure at or near its base and at another higher point. The stanchions should be not less than 32 mm in diameter and extend no less than 1.20 metres above the deck to which it is fitted.

4.8 Where the freeboard of the ship is more than 9 metres, a combination of accommodation and pilot ladders must be provided on each side of the ship.

4.9 Such accommodation ladders should comply with the standards in paragraph 2.1 of this annex, and in addition:

- the pilot ladder should extend at least 2 metres above the accommodation ladder's bottom platform; and
- if a trap door is fitted in the bottom platform to allow access to the pilot ladder, the opening should be no less than 750 mm square, and the after part of the bottom platform should be fenced as the rest of the ladder. In this case, the pilot ladder should extend above the lower platform to the height of the handrail.

CHAPTER 24

HOT WORK

24.1 Introduction

24.1.1 Based on the findings of the risk assessment, appropriate control measures should be put in place to protect those who may be affected. This chapter identifies some areas that may require attention in respect of hot work.

24.2 General

24.2.1 Hot work in places other than the workshop should be the subject of a permit to work (see Chapter 14, Permit to work systems).

24.2.2 Operators should be suitably trained in the process, familiar with the equipment to be used and instructed where special precautions need to be taken.

24.2.3 Before welding, flame cutting, angle grinding or other hot work is started, a check should be made that there are no combustible solids, liquids or gases at, below or adjacent to the area of work that might be ignited by heat or sparks from the work. Such work should never be undertaken on surfaces covered with grease, oil or other flammable or combustible materials. Where necessary, combustible materials and dunnage should be moved to a safe distance before commencing operations. Such places should also be free of materials that could release a flammable substance if disturbed, for example.

24.2.4 When hot work is to be done in the vicinity of open hatches, suitable screens should be erected to prevent sparks dropping down hatchways or hold ventilators.

24.2.5 Port holes and other openings through which sparks may fall should be closed where practicable.

24.2.6 When work is being done close to or at bulkheads, decks or deckheads, the far side of the divisions should be checked for materials and substances that may ignite, and for cables, pipelines or other services that may be affected by the heat.

24.2.7 Cargo tanks, fuel tanks, cargo holds, pipelines, pumps and other spaces that have contained flammable substances should be certified as being free of flammable gases before any repair work is commenced. The testing should include, as appropriate, the testing of adjacent spaces, double bottoms and cofferdams. Further tests should be carried out at

regular intervals and before hot work is recommenced following any suspension of the work. When carrying out hot work on tankers and similar ships, all tanks, cargo pumps and pipelines should be thoroughly cleaned and particular care taken with the draining and cleaning of pipelines that cannot be directly flushed using the ship's pumps.

24.2.8 Where portable lights are needed to provide adequate illumination, they should be clamped or otherwise secured in position, not handheld, with leads kept clear of the working area.

24.2.9 Hot work should be properly supervised and kept under regular observation. Suitable fire extinguishers should be kept at hand ready for use during the operation. A person with a suitable extinguisher should also be stationed to keep watch on areas that may be affected that are not visible to the seafarer doing the work.

24.2.10 In view of the risk of delayed fires resulting from the use of burning or welding apparatus, frequent checks should be made for at least two hours after the work has stopped.

24.3 Gas cutting

24.3.1 Harmful fumes can be produced from galvanising paint and other protective materials. Oxygen in the atmosphere can be depleted and noxious gases may be produced when using gas-cutting equipment. Special care should therefore be taken to provide adequate ventilation when welding and flame cutting in enclosed spaces. The effectiveness of the ventilation should be checked at intervals while the work is in progress and, if appropriate, local exhaust ventilation should be considered. In dangerous spaces, breathing apparatus may be required.

24.4 Welding

24.4.1 Exposure to welding fumes (including mild steel welding fumes) may cause lung cancer and, potentially, kidney cancer, and oxygen in the atmosphere can be depleted when welding. Local exhaust ventilation (LEV) should be provided, even if welding in the open. If LEV is not adequate to prevent exposure to the fumes, adequate and suitable respiratory protection equipment (RPE) should be worn.

BS EN 12941/2: 1998+A2:2008

24.4.2 Suggested procedures for lighting up and shutting down are in Annex 24.1.

24.5 Personal protective equipment

BS EN ISO 11611:2015
BS EN 169:2002

24.5.1 Personal protective equipment complying with the relevant standard specifications or their equivalent must be worn by the operator and as appropriate by those assisting with the operation to protect them from particles of hot metal and slag, and protect their eyes and skin from ultra-violet and heat radiation. Where RPE is worn to prevent exposure to welding fumes, it must be compatible with other personal protective equipment (PPE) being worn at the same time.

The operator should normally wear:

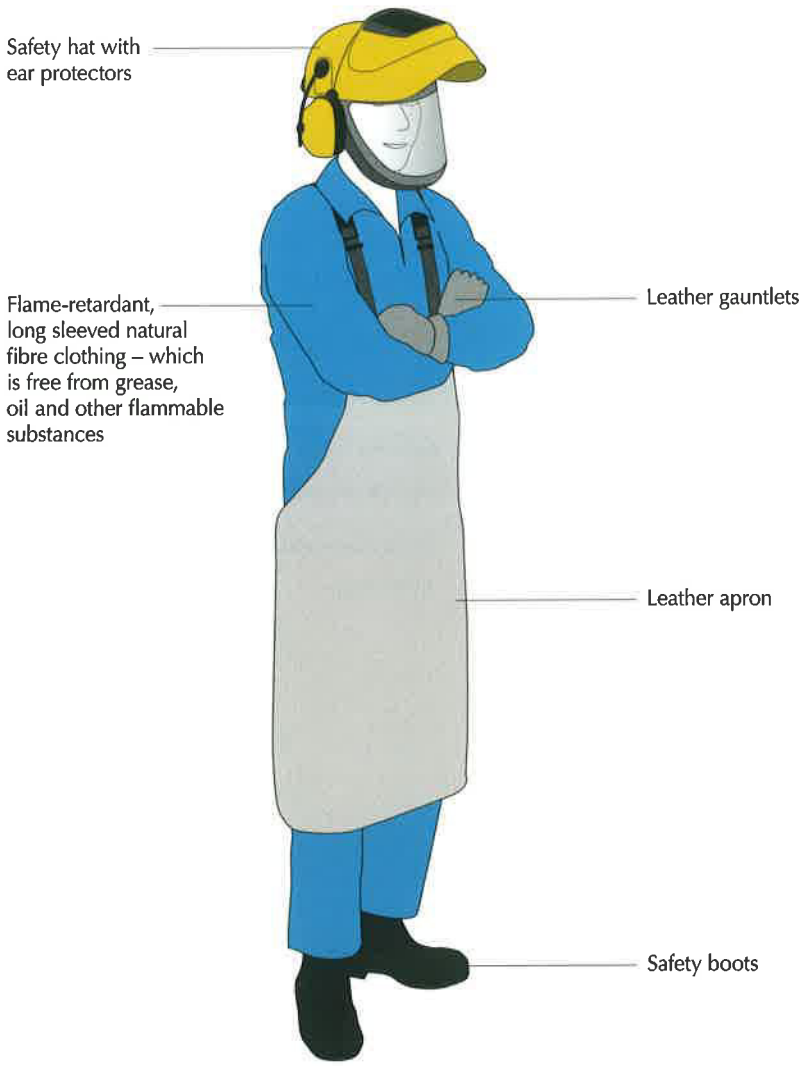
- welding shields or welding goggles with appropriate shade of filter lens to EN 169 (goggles are only recommended for gas welding and flame cutting);
- leather gauntlets;

BS EN 1146

- leather apron (in appropriate circumstances);
- where necessary to avoid exposure to welding fumes, RPE for toxic atmospheres; and
- long-sleeved natural-fibre boiler suit or other approved protective clothing.

24.5.2 Clothing should be free of grease and oil and other flammable substances.

Typical PPE for use whilst undertaking Hot Work



24.6 Pre-use equipment check

24.6.1 Hot work equipment should be inspected before use by a competent person to ensure that it is in a serviceable condition.

24.6.2 In cold weather, moisture trapped in the equipment may freeze and, for example, cause valves to malfunction. It is recommended that equipment is thawed out with hot water and cloths, never with naked flames.

24.7 Electric welding equipment

24.7.1 In order to minimise personal harm from electric shock, electric welding power sources for shipboard use should have a direct current (DC) output not exceeding 70V, with a minimum ripple. Further information on DC power sources is given in section 24.7.11.

24.7.2 When DC equipment is not available, AC output power sources may be used providing they have an integral voltage-limiting device to ensure that the idling voltage (the voltage between electrode and workpiece before an arc is struck between them) does not exceed 25 V rms. The proper function of the device (which may be affected by dust or humidity) should be checked each time a welding set is used. Some voltage-limiting devices are affected by their angle of tilt from the vertical, so it is important that they are mounted and used in the position specified by the manufacturers. This requirement can be affected by adverse sea conditions.

24.7.3 A 'go-and-return' system using two cables from the welding set should be adopted; the welding return cable should be firmly clamped to the workpiece.

24.7.4 Earthing of the workpiece is used to provide protection against internal insulation failure of the welding transformer, by keeping the workpiece at or near earth potential until the protective device (e.g. a fuse) operates to cut off the mains supply. Where the welding circuit is not adequately insulated from the earthed referenced mains supply (i.e. not constructed to one of the standards listed in Annex 24.2), the workpiece should be earthed. The 'return' cable of the welding set and each workpiece should be separately earthed to the ship's structure. The use of a single cable with hull return is not recommended. The workpiece earthing conductor should be robust enough to withstand possible mechanical damage and should be connected to the workpiece and a suitable earth terminal by bolted lugs or secure screw clamps.

Note: Some manufacturers may recommend earthing as one of their measures to reduce electrical interference. This is not a safety-related measure, but the manufacturer's advice should be followed.

24.7.5 If an alternative method of protecting against welding transformer insulation failure is used, the hazards caused by stray welding currents can be avoided by not earthing the workpiece or the welding output circuit. Self-contained engine-driven welding sets, and welding power sources that comply with the standards listed in Annex 24.2, do not need the workpiece to be earthed. It should be noted, however, that other equipment connected to the workpiece may require earthing for safe operation (e.g. welding sets not constructed to one of the standards listed in Annex 24.2 or electrical pre-heating systems).

24.7.6 To avoid voltage drop in transmission, the lead and return cables should be of the minimum length practicable for the job and of an appropriate cross-section.

24.7.7 Cables should be inspected before use; if the insulation is impaired or conductivity reduced, they should not be used.

EN 60529:1992 + A2:2013

24.7.8 Cable connectors should be fully insulated when connected, and so designed and installed that current-carrying parts are adequately recessed when disconnected.

24.7.9 Electrode holders should be fully insulated so that no live part of the holder is exposed to touch and, where practicable, they should be fitted with guards to prevent accidental contact with live electrodes, and as protection from sparks and splashes of weld metal.

24.7.10 A local switching arrangement or other suitable means should be provided for rapidly cutting off current from the electrode should the operator get into difficulties, and also for isolating the holder when electrodes are changed.

24.7.11 The direct current output from power sources should not exceed 70 volts open circuit. The ripple on the output from the power source should not exceed the values of the table below. The ripple magnitudes are expressed as percentages of the DC, and the ripple peak is that with the same polarity as the DC.

Ripple frequency, Hz	50/60	300	1200	2400
Max. rms O/C voltage ripple, (%)	5	6	8	10
Max. peak O/C voltage ripple, (%)	10	12	16	20

24.7.12 The conditions in the table in section 24.7.11 are normally met by DC generators incorporating commutators and by rectifier power sources having a three-phase bridge rectifier operating from a three-phase 50/60 Hz supply. Rectifier power sources should not be operated from a power supply of less than 50 Hz.

24.7.13 Should it be necessary to use a power source with a DC output having a ripple magnitude in excess of those stated in the table (e.g. a single-phase rectifier power source), then a voltage-limiting device should be incorporated in the power source to ensure that the idling voltage does not exceed 42V.

24.8 Precautions to be taken during electric arc welding

24.8.1 In addition to the protective clothing specified in section 24.5.1, the welding operator should wear non-conducting safety footwear complying with BS 7193:1989. Clothing should be kept as dry as possible as some protection against electric shock; it is particularly important that gloves should be dry because wet leather is a good conductor.

24.8.2 An assistant should be in continuous attendance during welding operations and they should be alert to the risk of accidental shock to the welder and ready to cut off power instantly, raise the alarm and provide artificial respiration without delay. It may be desirable to have a second assistant if the work is to be carried out in difficult conditions.

24.8.3 Where persons other than the operator are likely to be exposed to harmful radiation or sparks from electric arc welding, they should be protected by screens or other effective means.

24.8.4 In restricted spaces, where the operator may be in close contact with the ship's structure or is likely to make contact in the course of ordinary movements, protection should be provided by dry insulating mats or boards.

24.8.5 There are increased risks of electric shock to the operator if welding is done in hot or humid conditions; body sweat and damp clothing greatly reduce body resistance. Under such conditions, the operation should be deferred until such time that an adequate level of safety can be achieved.

24.8.6 In no circumstances should a welder work while standing in water or with any part of their body immersed.

24.8.7 The electrode holder should be isolated from the current supply before a used electrode is removed and before a new electrode is inserted. This precaution is necessary because some electrode coatings have extremely low resistance. Even a flux coating, which is normally insulating, can become damp from sweating hands and thus potentially dangerous.

24.8.8 When the welding operation is completed or temporarily suspended, the electrode should be removed from the holder.

24.8.9 Hot electrode ends should be ejected into a suitable container; they should not be handled with bare hands.

24.8.10 Spare electrodes should be kept dry in their container until required for use.

24.9 Compressed gas cylinders

24.9.1 Compressed gas cylinders should always be handled with care, whether full or empty. They should be properly secured and stored in a location appropriate to their intended use and risks, which an inadvertent release of gas may present. The cylinders should be so secured as to be capable of quick and easy release, e.g. in the case of fire. Where appropriate, cylinder trolleys should be used to transport cylinders from one place to another.

24.9.2 If the cylinder design permits protective caps over the valve, such caps should be screwed in place when the cylinders are not in use or are being moved. Where the cylinder design does not permit protective caps over the valve, the valve system should be protected from inadvertent damage, e.g. from impact. Valves should be closed when cylinders are empty.

24.9.3 Care should be taken in the storage of flammable gases used for hot work. The storage should:

- be separated according to type of gas, and empty cylinders kept separate from full ones;
- be well ventilated;
- not be subject to extremes of temperatures;
- not contain any sources of ignition, including electronic devices; and
- be prominently marked 'No smoking' and have safety signs in accordance with the standards in Chapter 9, Safety signs and their use, Annex 9.1.

24.9.4 The following precautions also need to be taken in the case of compressed gas cylinders:

- Cylinders' valves, controls and associated fittings should be kept free from oil, grease and paint; controls should not be operated with oily hands.
- Gas should not be taken from such cylinders unless the correct pressure-reducing regulator has been attached to the cylinder outlet valve.

- Cylinders found to have leaks that cannot be stopped by closing the outlet valve should be taken to the open deck away from any sources of heat or ignition and slowly discharged to the atmosphere.

24.9.5 Identifying marks on cylinders are set out in section 9.7.

24.10 Gas welding and cutting

24.10.1 While this section deals almost exclusively with oxygen and acetylene, other fuel gases may be used and similar precautions should be taken.

24.10.2 The pressure of oxygen used for welding should always be high enough to prevent acetylene flowing back into the oxygen line.

24.10.3 Acetylene should not be used for welding at a pressure exceeding 1 atmosphere gauge because it is liable to explode when under excessive pressure, even in the absence of air.

24.10.4 Non-return valves should be fitted adjacent to the torch in the oxygen and acetylene supply lines.

24.10.5 Flame arrestors should be provided in the oxygen and acetylene supply lines and will usually be fitted at the low-pressure side of regulators, although they may be duplicated at the torch.

24.10.6 Should a backfire occur (i.e. the flame returns into the blowpipe and continues burning in the neck or mixing chamber), the recommended first action is to close the oxygen valve on the blowpipe – to prevent internal burning – followed immediately by shutting off the fuel gas at the blowpipe valve. Items 3–6 of the shutting-down procedure in Annex 24.1 may then be followed. When the cause of the backfire has been discovered, the fault rectified and the blowpipe cooled down, the blowpipe may be re-lit.

24.10.7 If there is a flashback into the hose and equipment, or a hose fire or explosion, or a fire at the regulator connections or gas supply outlet points, the first action should be to isolate the oxygen and fuel gas supplies at the cylinder valves or gas supply outlet points – but only if this can be done safely. Further action should follow in accordance with the vessel's fire-drill requirements.

24.10.8 A watch should be kept on acetylene cylinders to ensure that they are not becoming hot. If they are, this could be a sign of acetylene decomposition and there is an increased risk of explosion. The cylinder stop valve should be closed immediately, which may limit or reduce the decomposition but is unlikely to stop it. Emergency action, such as evacuating the area and prolonged cooling by immersion or with copious

amounts of water, will still be required. Consideration should be given to jettisoning the cylinder overboard, although movement of the cylinder can promote rapid decomposition, and cooling should continue while it is being moved. Any acetylene cylinder suspected of overheating should be approached with extreme caution because an impact could set off an internal ignition, which might cause an explosion.

24.10.9 Only acetylene cylinders of approximately equal pressures should be coupled.

24.10.10 In fixed installations, manifolds should be clearly marked with the gas they contain.

24.10.11 Manifold hose connections, including inlet and outlet connections, should be such that the hose cannot be interchanged between fuel gases and oxygen manifolds and headers.

24.10.12 Only those hoses specially designed for welding and cutting operations should be used to connect any oxy-acetylene blowpipe to gas outlets.

24.10.13 Any length of hose in which a flashback has occurred should be discarded.

EN 1256:2006

24.10.14 The connections between hose and blowpipe and between hoses should be securely fixed with fittings that comply with Standard EN 1256. (More detailed guidance on hose connections and assemblies can be found in Annex 24.3.)

24.10.15 Hoses should be arranged so that they are not likely to become kinked, tangled, tripped over, cut or otherwise damaged by moving objects or falling metal slag, sparks, etc. A sudden jerk or pull on a hose is liable to pull the blowpipe out of the operator's hands, or cause a cylinder to fall or a hose connection to fail. Hoses in passageways should be covered to avoid them becoming a tripping hazard.

24.10.16 Soapy water should only be used for testing leaks in hoses. If there are leaks that cannot easily be stopped, the gas supply should be isolated and the leaking components taken out of service, replaced or repaired. If the leak is at a cylinder valve or pressure regulator ('bull-nose') connection, the cylinder should be removed to a safe place in the open air. If it is a fuel-gas cylinder, it should be taken well clear of any source of ignition.

24.10.17 Excessive force should never be used on cylinder valve spindles or hexagon nuts of regulator connections in an attempt to stop a leak. Sealing tape and other jointing materials are not recommended for use in an attempt to prevent leaks between metal–metal surfaces that are

designed to be gas tight. With an oxygen cylinder, this could result in initiation of a metal–oxygen fire.

24.10.18 Blowpipes should be lit with a special friction igniter, stationary pilot flame or other safe means.

24.10.19 Should a blowpipe-tip opening become clogged, it should be cleaned only with the tools especially designed for that purpose.

24.10.20 When a blowpipe is to be changed, the gases should be shut off at the pressure-reducing regulators.

24.10.21 To prevent a build-up of dangerous concentrations of gas or fumes during a temporary stoppage or after completion of the work, supply valves on gas cylinders and gas mains should be securely closed and blowpipes, hoses and moveable pipes should be removed to lockers that open onto the open deck.

24.10.22 Oxygen should never be used to ventilate, cool or blow dust off clothing.

24.11 Further information

24.11.1 Detailed advice on the selection and standards for equipment used in hot work is contained in the Health and Safety Executive (HSE) guidance note, 'HSG139 The safe use of compressed gases in welding, flame cutting and allied processes', which can be found on the HSE website.

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26.5.4 Seafarers involved must understand their duties and they should be adequately briefed on the operation and the safety precautions to be taken. They should be equipped with personal protective equipment including safety helmets, safety shoes and gloves. During hours of darkness, care should be taken to ensure that floodlighting will not dazzle and destroy the night vision of the tug master.

26.5.5 On instruction from the bridge, the heaving line should be thrown over to the tug from the shoulder (when taking a tow forward) of the vessel and not from the position of the Panama/Suez fairlead. The position in front of the vessel's (bulbous) bow is the most dangerous for the tug. The tug will then attach a messenger, which is placed on a winch and used to heave the tug's main towline on board. Only enough turns of the messenger should be used on the drum end to heave in the towline (see section 26.3.16). A stopper is then used while the eye is placed around the bollard. On tankers, the towline's eye should not be placed over the same bollard that the fire wire has made fast to. The fire wire should be taken off if there is no bollard available. The whole operation should be conducted efficiently to allow the tug to withdraw to a safe position without undue delay.

26.5.6 Once the tow is connected, seafarers should keep clear of the operational area. If anyone is required to remain in this area or to attend to towing gear during the towing operation, they should take extreme care to keep clear of bights of wire or rope and the snap-back zone at all times.

26.5.7 During operations, communications should be maintained between:

- the towing vessel and both the bridge team and the foredeck of the vessel under tow; and
- the tow party and the bridge team.

All parties should identify themselves clearly to avoid misunderstandings. The tug master should be kept informed of engine movements, proposed use of thrusters, etc. Seafarers in charge of the mooring party should monitor the towline to give warning to the crew if the towline should become taut, for whatever reason.

26.5.8 When letting go, no attempt should be made to heave in the messenger to release the tow before making positive communications with the tug. This should be done by the vessel's master or pilot and once the tug has indicated that it is ready to receive the tow back, the instruction to release must come from the vessel's master. The tug's messenger should be used to heave in the towline and then stopper it off before taking the eye off the bollard. Use turns of the messenger

around the bollard to control the speed at which the towline goes out and is retrieved on board the tug. This is particularly important aft where the towline, if it goes into the water, may foul the tug's propulsors. If the towline is allowed to run out uncontrolled, it could whiplash and strike a crew member, causing severe injuries. No attempt must be made to handle towlines that have weight on them.

MGN 592(M+F)

26.5.9 Further recommendations on towing are contained in the relevant merchant shipping notices (MSNs).

26.6 Safe mooring of domestic passenger craft and ships' launches to quays

26.6.1 The recognised and safe method for securing small vessels and launches alongside a quay or wharf in a good seafarer-like manner is by the use of all the following ropes:

- a fore spring;
- a back spring;
- a head rope; and
- a stern rope.

A risk assessment must be carried out for the full mooring arrangement and should include a diagram.

26.6.2 Annex 26.2 shows the full and safe mooring arrangement for small domestic passenger craft and ships' launches.

26.6.3 Reduced mooring arrangements may be used in exceptional circumstances. This may only be done after taking into account the weather and sea conditions, tidal state, tidal flow and respective snap-back zones. A risk assessment must be carried out for all arrangements that diverge from the full safe arrangement in section 26.6.1.

26.6.4 Passengers and seafarers should keep out of snap-back zones.

26.6.5 Where mid-ships mooring is the only means of making fast, breast lines may be run from mid-ships in addition to spring lines from the bow and stern.

26.6.6 Single-point mooring and steaming on a spring is not recommended and should be avoided.

27.11 Dangerous goods

27.11.1 This section should be read in conjunction with Chapter 21, Hazardous substances and mixtures. For guidance on dealing with emergencies involving dangerous goods, see Chapter 4, Emergency drills and procedures, and the International Maritime Dangerous Goods (IMDG) Code.

27.11.2 Prior to loading, freight vehicles carrying dangerous goods should be examined externally for damage and signs of leakage or shifting of contents. Any freight vehicle found to be damaged, leaking or with shifting contents should not be accepted for shipment. If a freight vehicle is found to be leaking after loading, a ship's officer should be informed and personnel kept well clear until it is ascertained that no danger to personnel persists.

27.11.3 Freight vehicles carrying dangerous goods and adjacent vehicles should always be secured.

27.11.4 Tank vehicles and tank containers on flat-bed trailers containing products declared as dangerous goods should be given special attention. Pre-voyage booking procedures should ascertain that tanks have been approved for the carriage of their contents by sea.

MGN 341(M)
MGN 545(M+F)
MGN 552(M)

27.12 Specialised vehicles

27.12.1 Gas cylinders used for the operation and business of vehicles such as caravans should be adequately secured against movement of the ship, with the gas supply cut off for the duration of the voyage. Leaking and inadequately secured or connected cylinders should be refused for shipment.

27.12.2 The following vehicles, trailers and loads should be given special consideration:

- Tank vehicles or tank containers containing liquids not classified as dangerous goods. These may be sensitive to penetration damage and may act as a lubricant. These vehicles must always be secured.
- Tracked vehicles and other loads making metal-to-metal contact with the deck; where possible, rubber mats or dunnage should be used.
- Loads on flat-bed trailers.
- Vehicles with hanging loads, such as chilled meat or floated glass.
- Partially filled tank vehicles.

27.12.3 Freight vehicles carrying livestock require special attention to ensure that they are properly secured, adequately ventilated and stowed so that access to the animals is possible. Further guidance is contained in the Department of the Environment, Food and Rural Affairs (Defra) regulation on the *Welfare of Animals During Transport: New rules for transporting animals* (see Appendix 2, Other sources of information).

27.12.4 Where vehicles are connected to electrical plug-in facilities, personnel should take the appropriate precautions as described in Chapter 18, Provision, care and use of work equipment, of this Code for working with any electrical equipment.

27.13 Housekeeping

27.13.1 All walkways should be kept clear.

27.13.2 All vehicle decks, ships' ramps and lifting appliances should, so far as is reasonably practicable, be kept free of water, oil, grease or any liquid that might cause a person to slip or that might act as a lubricant to a shifting load. Any spillage of such liquid should be quickly cleaned up; sand boxes, drip trays and mopping-up equipment should be available for use on each vehicle deck.

27.13.3 All vehicle decks, ships' ramps and lifting appliances should be kept free of obstructions and loose items such as stores and refuse.

27.13.4 Seafarers should be careful to avoid electrical points and fittings when washing down vehicle decks.

27.13.5 All scuppers should be kept clear of lashing equipment, dunnage, etc.

CHAPTER 32

SHIPS SERVING OFFSHORE RENEWABLES INSTALLATIONS

32.1 General

32.1.1 This chapter considers good practice on vessels supporting the construction, operation and maintenance of offshore renewable energy installations (OREIs). Vessels are needed for survey work, transporting components and materials, transfer of personnel, construction work, dive support and accommodation.

MGN 372(M+F)

32.1.2 Guidance on operation of vessels transiting in the vicinity of OREIs is published in MGN 372(M+F).

S.I. 2002/1587
MSN 1762(M+F)

32.1.3 Safety for diving operations is subject to HSE regulation and to the Merchant Shipping (Diving Safety) Regulations 2002 and MSN 1762(M+F).

32.2 Responsibility for offshore renewables personnel

S.I. 2015/51

32.2.1 While the vessel provider may be a contractor with duties under Construction (Design and Management) Regulations 2015, this does not in any way compromise the vessel master's duty to ensure the safety of the vessel, crew and passengers.

32.2.2 Those employed in the development, construction and maintenance of offshore windfarms may not have much experience of working in a maritime environment. Their employer has a responsibility to ensure that they receive the information, instruction, training and supervision necessary to safeguard their health and safety. The master of the vessel should also make certain that the personnel carried are familiar with emergency procedures on board, and give appropriate instructions and guidance to ensure that they are aware of the vessel's working practices in so far as they affect them.

32.3 Coordination

32.3.1 It is likely that a large number of organisations will be involved during both the construction and ongoing operation of OREIs.

Coordination is therefore key. Each OREI should have arrangements in place for the:

- provision of vessel traffic information and advice to masters;
- management and coordination of all site work/activities; and
- emergency response – see section 32.6.

32.3.2 Any marine operations within the area should be approved through the marine coordination arrangements that are already in place. Clear lines of responsibility and reporting should be established.

32.3.3 In addition, when planning work activities that involve more than one vessel or a vessel and an installation, it is important to identify any differences in their safety procedures, carry out a risk assessment and agree actions in advance that are clearly understood by all.

32.3.4 Vessels often work in close proximity to turbines or other structures, and to other vessels. Even where activities do not directly involve working together with other vessels/installations, a risk assessment should consider the impact of each vessel's activities on others. Where necessary, a sequence of actions and safe procedures should be agreed before the work starts.

32.4 Safe means of access to installations

32.4.1 Guidance on safe means of access is in Chapter 22, and the guidance for special circumstances in section 22.9 is particularly relevant.

IMCA M 202
S.I. 2005/735
S.I. 2007/114

32.4.2 Where passengers/industrial personnel or crew are accessing or leaving installations from a vessel, a risk assessment of the transfer arrangements should be undertaken and appropriate safety measures put into place to ensure the safety of those involved. Additional safety precautions should be taken during the hours of darkness. The arrangements during transfer must be compatible with the specific offshore installation and the operating company's safety management system and comply with the statutory standards for work at height regulations. The vessel should be properly equipped and/or modified (taking into account the design of the access point on the installation) to allow the transfer to be undertaken without unnecessary risk. A proper embarkation point should be provided and the boarding procedure clearly agreed.

32.4.3 The relative movements of the vessels in varying sea, tide and swell conditions make the judgement of when to effect a transfer crucial. The master responsible for the transfer operation should have full and direct sight of the area of transfer. In addition, the master and

at least one designated crew member should be able to communicate at all times with the person making the transfer. It is recommended that vessels undertaking ship-to-ship transfers while under way should carry equipment designed to aid in the rapid recovery of a casualty from the waters.

32.4.4 Those transferring and those working on exposed decks during transfer should wear a personal flotation device. Consideration should be given to requiring an immersion/survival suit to be worn, particularly in cold conditions. The transfer of baggage or other items should be carried out by the crews of the vessels and not by those transferring.

Further guidance on the transfer of personnel to and from offshore vessels and structures can be obtained from the International Marine Contractors Association (IMCA).

32.5 Carriage and transfer of dangerous cargoes

MGN 280(M)
MGN 497(M+F)

32.5.1 Where a workboat carries more than 30 kg or 30 litres net total quantity of dangerous goods, whether used on board for its own purposes or used by the industrial personnel for their own work, the vessel generally requires a Document of Compliance to Carry Dangerous Goods (DoC DG). This is issued by the MCA, and the master and persons ashore responsible for allocating stores/equipment to be carried should receive training in the requirements of the International Maritime Dangerous Goods (IMDG) code. MGN 497(M+F) gives guidance on the storage of dangerous cargoes on board. For detailed requirements that should be complied with, refer to: MGN 280(M); the Workboat Code, Industry Working Group Technical Standard; or the Workboat Code, Edition 2.

32.6 Emergency response plans

32.6.1 OREI operators should have in place an Emergency Response Cooperation Plan agreed with MCA SAR Operations for the construction, operation and decommissioning phases of any OREI. These plans are designed to ensure that HM Coastguard (HMCG) and SAR resources have information about the fundamental details of an OREI and that both the developer/operator and HMCG have access to emergency contact numbers to permit rapid contact, information sharing and effective cooperation during an emergency situation. This will ensure that incidents arising on the site are effectively managed. Those operating vessels in the area may be required to take part in testing of the arrangements. The master should ensure that all seafarers on the vessel are familiar with the plan, and comply where appropriate with the arrangements set out.

32.7 Other sources of information

32.7.1 Further industry guidance is available (see Appendix 2).

APPENDIX 1

REGULATIONS, MARINE NOTICES AND GUIDANCE ISSUED BY THE MARITIME AND COASTGUARD AGENCY

This lists all the regulations, marine notices and other guidance referred to in this Code.

Statutory instruments (regulations) are available on www.legislation.co.uk

TSO publications are available from TSO, PO Box 29, Norwich, NR3 1GN; www.tsoshop.co.uk

Copies of Maritime and Coastguard Agency (MCA) marine notices and forms can be downloaded from www.gov.uk/government/organisations/maritime-and-coastguard-agency

There are three different types of marine notice:
Merchant Shipping Notice (MSN),
Marine Guidance Note (MGN) and
Marine Information Note (MIN).
These notices publicise to the shipping and fishing industries important safety, pollution prevention and other relevant information.

Merchant shipping notices are used to convey mandatory information that must be complied with under UK legislation. These MSNs relate to statutory instruments and contain the technical detail of such regulations.

Marine guidance notes give significant advice and guidance relating to the improvement of the safety of shipping and of life at sea, and to prevent or minimise pollution from shipping.

Marine information notes are intended for a more limited audience e.g. training establishments or equipment manufacturers, or contain information which will only be of use for a short period of time, such as timetables for MCA examinations. MINs are numbered in sequence and have a cancellation date (which will typically be no more than twelve months after publication).

Within each series of marine notices suffixes are used to indicate whether documents relate to merchant ships or fishing vessels, or to both. The suffixes following the number are:
(M) for merchant ships
(F) for fishing vessels
(M+F) for both merchant ships and fishing vessels.

Copies of MCA published leaflets are available from EC Group, Europa Park, Grays, Essex, RM20 4DN; email: mca@ecgroup.uk.com

The Code reference is shown in **bold** and the information is arranged in chapter order.

CHAPTER 1: MANAGING OCCUPATIONAL HEALTH AND SAFETY

Regulations:

1.1 S.I. 1997/2962 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 (as amended).

Marine notices:

1.2.5

MSN 1838(M) Maritime Labour Convention, 2006: Minimum age.
MGN 522(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 and the Merchant Shipping (Maritime Labour Convention) (Medical Certification) Regulations 2010; New and Expectant Mothers.

1.2.8 MGN 484(M) Amendment 1 Maritime Labour Convention, 2006: Health and safety published accident statistics – information and advice.

Guidance:

1.2.3 *Leading for Safety: A practical guide for leaders in the maritime industry:* www.gov.uk/government/uploads/system/uploads/attachment_data/file/288220/leading_for_safety-9.pdf

CHAPTER 2: SAFETY INDUCTION

Regulations:

2.2.1 S.I. 1999/2722 The Merchant Shipping (Musters, Training and Decision Support Systems) Regulations 1999.

2.6.1 S.I. 2008/3257 The Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008.

Marine notices:

2.2.1 MGN 71(M) Musters, drills, on-board training and instructions, and decision support systems.

2.6.1 MSN 1807(M+F) The Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008.

CHAPTER 3: LIVING ON BOARD

Regulations:

None

Marine notices:

3.2.1; 3.4.1 MSN 1886(M+F) Maritime Labour Convention, 2006: Work in Fishing Convention, 2007 (ILO No. 188) Medical Examination System: Appointment of Approved Doctors and Medical and Eyesight Standards.

3.2.1 MSN 1815(M+F) Amendment 3 Countries whose seafarer medical certificates are accepted as equivalent to the UK seafarer medical fitness certificate (ENG1).

3.5 MGN 399(M) Prevention of infectious disease at sea by immunisations and anti-malaria medication (prophylaxis).

3.6.4 MGN 505(M) Human element guidance – Part 1 Fatigue and fitness for duty: Statutory duties, causes of fatigue and guidance on good practice.

3.13.4 MGN 357(M+F) Night-time lookout – Photochromatic lenses and dark adaptation.

Guidance:

3.2.4 Maritime and Coastguard Agency (MCA), 'Your health at sea 8: Fit for purpose'.

3.2.7 MCA, *The Ship Captain's Medical Guide* (published by TSO).

CHAPTER 4: EMERGENCY DRILLS AND PROCEDURES

Regulations:

4.1.1; 4.4.9 S.I. 1999/2722 The Merchant Shipping (Musters, Training and Decision Support Systems) Regulations 1999.

4.2.8 S.I. 1998/2514 The Merchant Shipping (Passenger Ship Construction: Ships of Classes I, II, and II(A)) Regulations 1998.

Marine notices:

4.1.1

MGN 71(M) Musters, drills, on-board training and instructions, and decision support systems.

MSN 1579(M) Minimum training requirements for personnel nominated to assist passengers in emergency situations.

4.4.10 MGN 560(M) Life-saving appliances – Lifeboats, rescue boats, launching appliances, winches and on-load release gear – Operational and test procedures.

CHAPTER 5: FIRE PRECAUTIONS

None

CHAPTER 6: SECURITY ON BOARD

None

CHAPTER 7: HEALTH SURVEILLANCE

Regulations:

7.1.1 S.I. 1997/2962 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 (as amended).

7.3.1

S.I. 2007/3100 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Carcinogens and Mutagens) Regulations 2007.

S.I. 2007/3075 The Merchant Shipping and Fishing Vessels (Control of Noise at Work) Regulations 2007.

S.I. 2007/3077 The Merchant Shipping and Fishing Vessels (Control of Vibration at Work) Regulations 2007.

S.I. 2010/323 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Biological Agents) Regulations 2010.

S.I. 2010/330 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Chemical Agents) (as amended) Regulations 2010.

S.I. 2010/332 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Work at Height) Regulations 2010.

S.I. 2010/2984 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Asbestos) (as amended) Regulations 2010.

S.I. 2010/2987 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Artificial Optical Radiation) Regulations 2010.

7.8.1

S.I. 1997/2962 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (as amended) Regulations 1997.

S.I. 2014/1616 The Merchant Shipping (Maritime Labour Convention) (Health and Safety) (Amendment) Regulations 2014.

Marine notices:

7.3.2 MGN 409(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Chemical Agents) Regulations 2010.

7.7.3 MGN 408(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Biological Agents) Regulations 2010.

7.8.1 MSN 1850(M) Maritime Labour Convention, 2006: Health and Safety Reporting of Occupational Diseases.

Forms:

7.8.2 MSF 4159 Occupational disease report form for UK registered merchant ships.

CHAPTER 8: PERSONAL PROTECTIVE EQUIPMENT

Regulations:

8.1.1; 8.2 S.I. 1999/2205 The Merchant Shipping and Fishing Vessels (Personal Protective Equipment) Regulations 1999.

8.6.1 S.I. 2007/3075 The Merchant Shipping and Fishing Vessels (Control of Noise at Work) Regulations 2007.

Marine notices:
8.1.1; 8.2.4 MSN 1870(M+F) Amendment 1 The Merchant Shipping and Fishing Vessels (Personal Protective Equipment) Regulations 1999.
8.6.1 MGN 352(M+F) Amendment 1 The Merchant Shipping and Fishing Vessels (Control of Noise at Work) Regulations 2007.
Guidance:
8.6.1 Maritime and Coastguard Agency (MCA) (2009) *Code of Practice for Controlling Risks due to Noise on Ships,* London: TSO (ISBN 978-0-11-553075-3).

CHAPTER 9: SAFETY SIGNS AND THEIR USE

Regulations:
9.1.1 S.I. 2001/3444 The Merchant Shipping and Fishing Vessels (Safety Signs and Signals) Regulations 2001.
Marine notices:
9.1.1; Annex 9.1 MGN 556(M+F) The Merchant Shipping and Fishing Vessels (Safety Signs and Signals) Regulations 2001.
9.4.9 MSN 1676(M) The Merchant Shipping (Life-saving Appliances for Ships other than Ships of Classes III to VI(A)) Regulations 1999 and The Merchant Shipping (Life-saving Appliances for Passenger Ships of Classes III to VI(A)) Regulations 1999.
9.9.1 MSN 1665(M) The Merchant Shipping (Fire Protection) Regulations 1998: Fire-fighting equipment.

CHAPTER 10: MANUAL HANDLING

Regulations:
10.3 S.I. 1998/2857 The Merchant Shipping and Fishing Vessels (Manual Handling Operations) Regulations 1998.
Marine notices:
10.3 MGN 90(M+F) Amendment 1 Implementation of EC Directive 90/269/EC Merchant Shipping and Fishing Vessels (Manual Handling Operations) Regulations 1998.

CHAPTER 11: SAFE MOVEMENT ON BOARD SHIP

Regulations:
11.1.1; 11.13 S.I. 1997/2962 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (as amended) Regulations 1997.
11.2.3 S.I. 2001/3444 The Merchant Shipping and Fishing Vessels (Safety Signs and Signals) Regulations 2001.
11.10.1 S.I. 1988/1638 The Merchant Shipping (Entry into Dangerous Spaces) Regulations 1998.
Marine notices:
11.1 MGN 532(M) Amendment 1 Safe movement on board ship.
11.2.3 MGN 556(M+F) The Merchant Shipping and Fishing Vessels (Safety Signs and Signals) Regulations 2001.

11.7 MGN 35(M+F) Accidents when using power operated watertight doors.
Annex 11.2
MSN 1844(M) Maritime Labour Convention, 2006: Crew Accommodation.
MGN 481(M) Amendment 1 Maritime Labour Convention, 2006: Crew Accommodation, Supplementary Guidance.

CHAPTER 12: NOISE, VIBRATION AND OTHER PHYSICAL AGENTS

Regulations:
12.5.1 S.I. 2007/3075 The Merchant Shipping and Fishing Vessels (Control of Noise at Work) Regulations 2007.
12.10 S.I. 2007/3077 The Merchant Shipping and Fishing Vessels (Control of Vibration at Work) Regulations 2007.
12.18 S.I. 2010/2987 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Artificial Optical Radiation) Regulations 2010.
Marine notices:
12.5.1; Annex 12.2 MGN 352(M+F) Amendment 1 The Merchant Shipping and Fishing Vessels (Control of Noise at Work) Regulations 2007.
12.9.1 MGN 377(M+F) Sound advice – noise at work from music and entertainment.
12.10 MGN 353(M+F) The Merchant Shipping and Fishing Vessels (Control of Vibration at Work) Regulations 2007.
12.15.3 MGN 436(M+F) Amendment 1 Whole-body vibration: Guidance on mitigating against the effects of shocks and impacts on small vessels.
12.18 MGN 428 (M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Artificial Optical Radiation) Regulations 2010.
Guidance:
12.8.5 Maritime and Coastguard Agency (MCA) (2009) *Code of Practice for Controlling Risks due to Noise on Ships*, London: TSO (ISBN 978-0-11-553075-3).
12.14.8 MCA (2009) *Code of Practice for Controlling Risks due to Hand-transmitted Vibration on Ships*, London: TSO (ISBN 978-0-11-553090-6).
12.15.4 MCA (2009) *Code of Practice for Controlling Risks due to Whole-body Vibration in Ships*, London: TSO (ISBN 978-0-11-553076-0).

CHAPTER 13: SAFETY OFFICIALS

Regulations:
13.1; 13.2; 13.3; 13.4; 13.8 S.I. 1997/2962 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (as amended) Regulations 1997.
13.3.7.1; 13.3.8.4; 13.8.1 S.I. 2012/1743 The Merchant Shipping (Accident Reporting and Investigation) Regulations 2012.
Marine notices:
13.8.2 MGN 564(M+F) Amendment 1 Marine casualty and marine incident reporting.

CHAPTER 14: PERMIT TO WORK SYSTEMS

None

CHAPTER 15: ENTERING DANGEROUS (ENCLOSED) SPACES

Regulations:

S.I. 1988/1638 The Merchant Shipping (Entry into Dangerous Spaces) Regulations 1988.

CHAPTER 16: HATCH COVERS AND ACCESS LIDS

None

CHAPTER 17: WORK AT HEIGHT

Regulations:

17.1.1. S.I. 2010/332 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Work at Height) Regulations 2010.

17.2.4 S.I. 2006/2183 The Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) Regulations 2006.

Marine notices:

17.1.1; 17.3.1; 17.4.1; 17.5.1; 17.7.1; Annex 17.1 MGN 410(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Work at Height) Regulations 2010.

17.4.11 MGN 578(M) Use of equipment to undertake work over the side on commercial yachts, small commercial vessels and loadline vessels.

CHAPTER 18: PROVISION, CARE AND USE OF WORK EQUIPMENT

Regulations:

Annex 18.3 S.I. 2006/2183 The Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) Regulations 2006.

Marine notices:

18.2.4 MSN 1870(M+F) Amendment 1 The Merchant Shipping and Fishing Vessels (Personal Protective Equipment) Regulations 1999.

18.15 MGN 556(M+F) The Merchant Shipping and Fishing Vessels (Safety Signs and Signals) Regulations 2001.

18.30.1 MSN 1838(M) Maritime Labour Convention, 2006: Minimum age.

CHAPTER 19: LIFTING EQUIPMENT AND OPERATIONS

Regulations:

19.2.1; Annex 19.4 S.I. 2006/2184 The Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) Regulations 2006.

Marine notices:
19.2.1; 19.18.5; Annex 19.4 MGN 332(M+F) Amendment 1 The Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) Regulations 2006.

CHAPTER 20: WORK ON MACHINERY AND POWER SYSTEMS

Regulations:
20.3.1 S.I. 2006/2183 The Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) Regulations 2006.
20.3.6 S.I. 2019/42 The Merchant Shipping (Prevention of Oil Pollution) Regulations 2019.
Marine notices:
20.3.1 MGN 331(M+F) Amendment 1 The Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) Regulations 2006.
20.15 MGN 452(M) Electrical – potential hazards of arc flash associated with high and low voltage equipment.

CHAPTER 21: HAZARDOUS SUBSTANCES AND MIXTURES

Regulations:
21.2.1 S.I. 2007/3100 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Carcinogens and Mutagens) Regulations 2007.
21.4.1 S.I. 2010/2984 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Asbestos) (as amended) Regulations 2010.
21.5.1 S.I. 2010/330 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Chemical Agents) (as amended) Regulations 2010.
21.7.1 S.I. 1999/336 The Merchant Shipping (Carriage of Cargoes) Regulations 1999.
21.8.1 S.I. 2010/323 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Biological Agents) Regulations 2010.
Marine notices:
21.2.1 MGN 356(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Carcinogens and Mutagens) Regulations 2007.
21.4.1
MGN 429(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Asbestos) Regulations 2010.
MGN 493(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Asbestos) Regulations 2010 as amended by The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Asbestos) (Amendment) Regulations 2013.
21.5.1
MGN 409(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Chemical Agents) Regulations 2010.

MGN 454(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Chemical Agents) (Amendment) Regulations 2012.
21.7.1 MSN 1718(M) The safe use of pesticides in ships.
MGN 576(M) Guidance for those undertaking fumigation operations alongside.
21.8.1 MGN 408(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Biological Agents) Regulations 2010.

CHAPTER 22: BOARDING ARRANGEMENTS

Regulations:
22.1.1; 22.4.1 S.I. 1997/2962 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (as amended) Regulations 1997.
22.8.6; 22.9.1; Annex 22.1 S.I. 2002/1473 The Merchant Shipping (Safety of Navigation) Regulations 2002.
Marine notices:
22.9.1; Annex 22.1 MSN 1874(M+F) Amendment 2 Marine equipment – The Marine Equipment Directive, other approval and standards.
22.9.5 MGN 301(M+F) Manoeuvring information on board ships.

CHAPTER 23: FOOD PREPARATION AND HANDLING IN THE CATERING DEPARTMENT

Regulations:
23.1.19 S.I. 2008/3257 The Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008.
Marine notices:
23.1.1 MSN 1845(M) Maritime Labour Convention, 2006: Food and catering: Provision of food and fresh water.
23.1.19 MSN 1807(M+F) The Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008 – S.I. 2008 No. 3257.
23.4.3 MGN 312(F) Use of liquid petroleum gas (LPG) and diesel fuelled appliances on fishing vessels.

CHAPTER 24: HOT WORK

None

CHAPTER 25: PAINTING

None

CHAPTER 26: ANCHORING, MOORING AND TOWING OPERATIONS

Regulations: None
Marine notices:
26.5.9 MGN 592(M+F) Mooring, towing or hauling equipment on all vessels: Safe installation and safe operation.

CHAPTER 27: ROLL-ON/ROLL-OFF FERRIES

Regulations:

27.3.1

S.I. 1998/1011 The Merchant Shipping (Fire Protection: Small Ships) Regulations 1998.

S.I. 1998/1012 The Merchant Shipping (Fire Protection: Large Ships) Regulations 1998.

Marine notices:

27.2.2; 27.8.2; 27.12.1 MGN 341(M) Ro-ro ships' vehicle decks: Accidents to personnel, passenger access and the carriage of motor vehicles.

27.12.1

MGN 545 Guidance on the transport of dangerous goods as defined by the International Maritime Dangerous Goods (IMDG) Code when carried in a private vehicle not in commercial use or by a foot passenger on a Ro-Ro ship.

MGN 552 Cargo – safe stowage of specialised vehicles.

Guidance:

27.5.1 Maritime and Coastguard Agency (MCA) (2009) *Code of Practice for Controlling Risks due to Noise on Ships*, London: TSO (ISBN 978-0-11-553075-3).

27.6.2 MCA (2003) *Code of Practice on the Stowage and Securing of Vehicles on Roll-on/Roll-off Ships,* London: TSO: www.gov.uk/government/uploads/system/uploads/attachment_data/file/292367/ro-ro_stowage_securing_of_vehicles_cop.pdf

CHAPTER 28: DRY CARGO

Regulations:

28.1.4 S.I. 1999/336 The Merchant Shipping (Carriage of Cargoes) Regulations 1999.

28.1.6 S.I. 1998/2241 The Merchant Shipping (Load Line) Regulations 1998.

28.2 S.I. 1997/2367 The Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997.

Marine notices:

28.1.4 MGN 107(M) The Merchant Shipping (Carriage of Cargoes) Regulations 1999.

28.2 MGN 340(M) International Maritime Dangerous Goods (IMDG) Code and cargoes carried in cargo transport units.

28.2.5 MSN 1706(M) The carriage of military and commercial explosives – amendment no. 1.

28.2.7 MSN 1870(M+F) Amendment 1 The Merchant Shipping and Fishing Vessels (Personal Protective Equipment) Regulations 1999.

28.4 MGN 157(M) Safety of personnel during container-securing operations and while working at corrugated bulkheads in general cargo ships.

APPENDIX 2

OTHER SOURCES OF INFORMATION

This appendix lists the sources of the documents referred to in this Code.

International Maritime Organization (IMO) publications are available from IMO Publishing, 4 Albert Embankment, London, SE1 7SR, email sales@imo.org or telephone +44 (0)20 7735 7611.

The Code reference is shown in **bold** and the information is arranged in chapter order.

CHAPTER 1: MANAGING OCCUPATIONAL HEALTH AND SAFETY

References:

National Health Service (NHS) choices, Mental health: www.nhs.uk/Livewell/MentalHealth/Pages/Mentalhealthhome.aspx
NHS choices, Stress, anxiety and depression: www.nhs.uk/conditions/stress-anxiety-depression/Pages/low-mood-stress-anxiety.aspx
NHS choices, Tiredness and fatigue: www.nhs.uk/livewell/tiredness-and-fatigue/Pages/tiredness-and-fatigue.aspx
1.2.1 *Code of Conduct for the Merchant Navy*: https://www.ukchamberofshipping.com/library/
1.2.7 National Maritime Occupational Health and Safety Committee (NMOHSC), *Guidelines to Shipping Companies on Behavioural Safety Systems*: https://www.ukchamberofshipping.com/library/

CHAPTER 2: SAFETY INDUCTION

References:

2.1.1

International Maritime Organization (IMO), International Convention on Standards of Training, Certification and Watchkeeping (STCW) for Seafarers, 1978, as amended: www.imo.org/en/OurWork/HumanElement/TrainingCertification/Pages/STCW-Convention.aspx
International Labour Organization (ILO), Maritime Labour Convention, 2006: www.ilo.org/global/standards/maritime-labour-convention/lang--en/index.htm

CHAPTER 3: LIVING ON BOARD

References:

National Health Service (NHS) Choices, Mental health:
www.nhs.uk/Livewell/MentalHealth/Pages/Mentalhealthhome.aspx
NHS Choices, Stress, anxiety and depression:
www.nhs.uk/conditions/stress-anxiety-depression/Pages/low-mood-stress-anxiety.aspx
3.2.4 National Health Service (NHS) Choices, 'Healthy eating':
www.nhs.uk/livewell/healthy-eating/Pages/Healthyeating.aspx
3.3.2 NHS Choices, 'Stop smoking':
www.nhs.uk/livewell/smoking/Pages/stopsmokingnewhome.aspx
3.3.5 NHS Smokefree website, 'E-cigarettes':
https://www.nhs.uk/smokefree/help-and-advice/e-cigarettes
Public Health England, 'Evidence review of e-cigarettes and heated tobacco products 2018: executive summary':
https://www.gov.uk/government/publications/e-cigarettes-and-heated-tobacco-products-evidence-review/evidence-review-of-e-cigarettes-and-heated-tobacco-products-2018-executive-summary#poisonings-fires-and-explosions
3.6 International Maritime Organization (IMO), MSC/Circ.813 The role of human element, list of human element common terms:
www.imo.org/en/OurWork/HumanElement/VisionPrinciplesGoals/Documents/1014.pdf
NHS Choices, Tiredness and fatigue:
www.nhs.uk/livewell/tiredness-and-fatigue/Pages/tiredness-and-fatigue.aspx
3.7.2 Health and Safety Executive (HSE), 'Thermal comfort':
www.hse.gov.uk/temperature/thermal
3.8.1 Canadian Centre for Occupational Health and Safety (CCOHS), 'Cold environments: working in the cold':
https://www.ccohs.ca/oshanswers/phys_agents/cold_working.html
3.8.3 NHS Choices, 'Frostbite':
www.nhs.uk/conditions/frostbite/Pages/Introduction.aspx
3.8.3 NHS Choices, 'Hypothermia':
www.nhs.uk/conditions/Hypothermia/Pages/Introduction.aspx

CHAPTER 4: EMERGENCY DRILLS AND PROCEDURES

References:

4.6.1; 4.7.4 National Maritime Occupational Health and Safety Committee (NMOHSC), *Man Overboard! Guidelines to shipping companies on procedures in cases of man overboard*:
https://www.ukchamberofshipping.com/library/
4.6.1 *Bridge Procedures Guide,* International Chamber of Shipping (ICS):
www.ics-shipping.org
4.11.2 International Maritime Dangerous Goods (IMDG) Code.

4.11.2 Emergency Procedures for Ships Carrying Dangerous Goods (EmS Guide).

CHAPTER 5: FIRE PRECAUTIONS

5.5.4 International Maritime Organization (IMO), MSC.1/Circ.1321 Guidelines for Measures to Prevent Fires in Engine Rooms and Cargo Pump Rooms:
www.imo.org/blast/blastDataHelper.asp?data_id=25964&filename=1321.pdf

CHAPTER 6: SECURITY ON BOARD

References:

6.2.1 International Maritime Organization (IMO), The International Ship and Port Facility Security (ISPS) Code:
www.imo.org/en/ourwork/security/guide_to_maritime_security/pages/solas-xi-2%20isps%20code.aspx

6.2.1 EC 725/2004: eur-lex.europa.eu/homepage.html

CHAPTER 7: HEALTH SURVEILLANCE

References:

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www.nhs.uk/Livewell/MentalHealth/Pages/Mentalhealthhome.aspx
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ISO 7364:1983	Shipbuilding and marine structures – Deck machinery – Accommodation ladder winches	Annex 22.1, 3.2
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