

SAFE SYSTEMS OF WORK

15.1 Introduction

15.1.1 This chapter suggests some control measures which may be taken to protect those who may be put at risk in some key areas on board ship. Such measures should be based on the findings of the risk assessment.

15.2 Working aloft and outboard

(M+F) **15.2.1** Anyone working and not standing on level ground or at deck level is working at height. Also undertaking work inside a tank, near an opening, such as a hatch, or on a fixed stairway may be regarded as working at height if there is a danger of injury if the worker fell. Further guidance is contained in MGN 410 (M+F).

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15.2.2 Work should only be carried out at height if there is no reasonably practicable alternative to doing so. Where a reasonably practicable alternative does exist it should be adopted. Where work must be carried out at height, the employer must ensure that such work is properly planned, appropriately supervised and carried out in as safe a manner as is reasonably practicable. In this context, planning should include the carrying out of a risk assessment in accordance with regulation 7 of the MS (Health and Safety at Work) Regs 1997 No 2962 which might include considering potential risks from falling objects or fragile surfaces. In addition, work equipment should be selected and used in accordance with the provisions of the PUWER 2006 and LOLER 2006 Regulations.

15.2.3 Personnel working at a height may not be able to give their full attention to the job and at the same time guard themselves against falling. Proper precautions should therefore always be taken to ensure personal safety when work has to be done aloft or when working outboard. It must be

remembered that the movement of a ship in a seaway and extreme weather conditions even when alongside, will add to the hazards involved in work of this type. A stage or ladder should also be utilised when work is to be done beyond normal reach.

15.2.4 Personnel under 18 years of age or with less than 12 months experience at sea, should not work aloft unless accompanied by an experienced person or otherwise adequately supervised.

15.2.5 Personnel working aloft should wear safety harness with lifeline or other attesting device at all times (see section 4.10). A safety net should be rigged where necessary and appropriate. Additionally, where work is done overside, buoyancy garments should be worn and a lifebuoy with sufficient line attached should be kept ready for immediate use. Personnel should be under observation from a person on deck.



15.2.6 Other than emergency situations personnel should not work overside whilst the vessel is underway. If such work has to be undertaken lifeboats or rescue boats should be ready for immediate use. Any such work should be closely monitored/watched by a responsible person.

15.2.7 Before work is commenced near the ship's whistle, the officer responsible should ensure that power is shut off and warning notices posted on the bridge and in the machinery spaces.

15.2.8 Before work is commenced on the funnel, the officer responsible should inform the duty engineer to ensure that steps are taken to reduce as far as practicable the emission of steam, harmful gases and fumes.

15.2.9 Before work is commenced in the vicinity of radio aerials, the officer responsible should inform the radio room or person in charge of radio equipment so that no transmissions are made whilst there is risk to personnel. A warning notice should be put up in the radio room.

15.2.10 Where work is to be done near the radar scanner, the officer responsible should inform the officer on watch so that the radar and scanner are isolated. A warning notice should be put on the set until the necessary work has been completed.

15.2.11 On completion of the work of the type described above, the person responsible should, where necessary, inform the appropriate person that the precautions taken are no longer required and that warning notices can be removed.

15.2.12 Work aloft should not be carried out in the vicinity of cargo working, unless it is essential. Care must always be taken to avoid risks to anyone working or moving below. Suitable warning notices should be displayed. Tools and stores should be sent up and lowered by line in suitable containers which should be secured in place for stowage of tools or materials not presently being used.

15.2.13 No one should place tools where they can be accidentally knocked down and may fall on someone below, nor should tools be carried in pockets from which they may easily fall. When working aloft it is often best to wear a belt designed to hold essential tools securely in loops.

15.2.14 Tools should be handled with extra care when hands are cold and greasy and where the tools themselves are greasy.

15.3 Portable ladders

(M+F) **15.3.1** A portable ladder should only be used where no safer means of access is reasonably practicable. It is very important that the ladder is checked regularly by a competent person. Annex A (reproduced from MGN 410) gives further guidance.

15.3.2 Wooden ladders should not be painted or treated so as to hide defects and cracks. When not in use they should be stowed safely in a dry ventilated space away from any heat source.

15.3.3 Portable ladders should be pitched between 60 and 75 degrees from the horizontal, on a firm base, properly secured against slipping or shifting sideways and be so placed as to afford a clearance of at least 150 mm behind the rungs. Where practicable the ladder should extend to at least 1 metre above any upper landing place unless there are other suitable handholds.

15.3.4 When portable extending ladders are in use, there should be sufficient overlap between the extensions.

15.3.5 Personnel negotiating a ladder should use both hands, and not attempt to carry tools or equipment in their hands.

15.3.6 Planks should not be supported on rungs of ladders to be used as staging, nor should ladders be used horizontally for such purposes.

15.3.7 Working from ladders should be avoided as far as possible, but where necessary personnel must use a safety harness with lifeline secured above the work position.



15.4 Cradles and stages

- (M+F) **15.4.1** Cradles should be at least 430 mm (17 inches) wide and fitted with guard rails or stanchions with taut ropes to a height of one metre (39 inches) from the floor. Toeboards add safety. Annex C (reproduced from MGN 410) gives further guidance.
- 15.4.2** Planks and materials used for the construction of ordinary plank stages must be carefully examined to ensure adequate strength and freedom from defect.
- 15.4.3** Wooden components of staging should be stowed in a dry, ventilated space and not subjected to heat.
- 15.4.4** Ancillary equipment, lizards, blocks and gantlines should be thoroughly examined before use.
- 15.4.5** When a stage is rigged overside, the two gantlines used in its rigging should be at least long enough to trail into the water to provide additional lifelines should the operator fall. A lifebuoy and line should still be kept ready at a close position.
- 15.4.6** Gantlines used for working aloft should not be used for any other purpose and should be kept clear of sharp edges when in use.
- 15.4.7** The anchoring points for lines, blocks and lizards must be of adequate strength and, where practicable, be permanent fixtures to the ship's structure. Integral lugs should be hammer tested. Portable rails or stanchions must not be used as anchoring points. Any anchoring points should be treated as lifting points and should be inspected/tested in accordance with Chapter 21 of this Code.
- 15.4.8** Stages and staging which are not suspended should always be

secured against movement. Hanging stages should be restricted against movement to the extent practicable.

15.4.9 In machinery spaces, staging and its supports should be kept clear of contact with hot surfaces and moving parts of machinery. In the engine room, a crane gantry should not be used directly as a platform for cleaning or painting, but can be used as the base for a stable platform if suitable precautions are taken (see section 24.3.6).

15.4.10 Where personnel working from a stage are required to raise or lower themselves, great care must be taken to keep movements of the stage small and closely controlled.

15.5 Bosun's chair

(M+F)

15.5.1 When used with a gantline the chair should be secured to it with a double sheet bend and the end seized to the standing part with adequate tail. Annex C (reproduced from MGN 410) gives further guidance.

15.5.2 Hooks should not be used to secure bosun's chairs unless they are of the type which because of their special construction cannot be accidentally dislodged, and have a marked safe working load which is adequate for the purpose.

15.5.3 On each occasion that a bosun's chair is rigged for use, the chair, gantlines and lizards must be thoroughly examined, and renewed if there is any sign of damage, and load tested to at least 4 times the load they will be required to lift before a person is hoisted.

15.5.4 When a chair is to be used for riding topping lifts or stays, it is essential that the bow of the shackle, and not the pin, rides on the wire. The pin in any case should be seized.

15.5.5 When it is necessary to haul a person aloft in a bosun's chair it should be done only by hand; a winch should not be used.

15.5.6 If a worker is required to lower himself while using a bosun's chair, he should first frap both parts of the gantline together with a suitable piece of line to secure the chair before making the lowering hitch. The practice of holding on with one hand and making the lowering hitch with the other is dangerous. It may be prudent to have someone standing by to tend the lines.

15.6 Working from punts

15.6.1 Punts should be stable and provided with suitable fencing. Unsecured trestles and planks should not be used to give additional height.

15.6.2 The person in charge should have due regard to the strength of tides and other hazards, such as wash from passing vessels, before a punt is put to use.

15.6.3 When work is to be done at or near the stern or other propeller aperture, the person in charge should inform the duty engineer and deck officers so that warning notices are put up in the engine room, at the controls and on the bridge.

15.6.4 The duty engineer and deck officers should also be informed by the person in charge when seamen are working below ship's side discharges so they are not used until the work is completed. Notices to this effect should be attached to the relevant control valves and not taken off until those working are reported clear.

15.7 Work in machinery spaces

15.7.1 Merchant Shipping regulations require every dangerous part of a ship's machinery to be securely guarded unless it is so positioned or constructed that it is as safe as if it were securely guarded or is otherwise safeguarded. Guidance on the interpretation of these Regulations is given in MGN 331(M+F).

15.7.2 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.

15.7.3 Personnel required to work in machinery spaces which have high noise levels should wear suitable hearing protectors (see section 4.6).

15.7.4 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 IMO Code on Alarms and Indicators.

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

15.7.6 Waste oil should not be allowed to accumulate in the bilges or on tank tops. Any leakage of fuel, lubricating and hydraulic oil should be disposed of in accordance with Oil Pollution Regulations 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.

15.7.7 Great 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 other openings in the tanks should always be secured so that should a tank be overfilled the oil is directed to a safe place through the overflow arrangements.

15.7.8 Particular care should be taken when filling tanks which have their sounding pipes in the machinery spaces to ensure that weighted cocks are

closed. In no case should a weighted cock on a fuel or lubricated oil tank sounding pipe or on a fuel, lubricating or hydraulic oil tank gauge be secured in the open position.

15.7.9 Engine room bilges should at all times be kept clear of rubbish and other substances so that mud-boxes are not blocked and the bilges may be readily and easily pumped.

15.7.10 Remote controls fitted for stopping machinery or pumps or for operating oil-tank quick-closing valves in the event of fire, should be tested regularly to ensure that they are functioning satisfactorily. This also applies to the controls on fuel storage daily service tanks (other than double bottoms) and lubricating oil tanks.

15.7.11 Cleaning solvents should always be used in accordance with manufacturers' instructions and in an area that is well ventilated.

15.7.12 Care should be taken to ensure that spare gear is properly stowed and items of machinery under overhaul safely secured so that they do not break loose and cause injury or damage even in the heaviest weather.

15.8 Boilers

15.8.1 A notice should be displayed at each boiler setting out operating instructions. Information provided by the manufacturers of the oil-burning equipment should be displayed in the boiler room.

15.8.2 To avoid the danger of a blowback when lighting boilers, the correct flashing up procedure should always be followed:

- (a) there should be no loose oil on the furnace floor;
- (b) the oil should be at the correct temperature for the grade of oil being used; if not, the temperature of the oil must be regulated before lighting is attempted;

- (c) the furnace should be blown through with air to clear any oil vapour;
- (d) the torch, specially provided for the purpose, should always be used for lighting a burner unless an adjacent burner in the same furnace is already lit; other means of ignition, such as introducing loose burning material into the furnace, should not be used. An explosion may result from attempts to relight a burner from the hot brickwork of the furnace;
- (e) if all is in order, the operator should stand to one side, and the lighted torch inserted and fuel turned on. Care should be taken that there is not too much oil on the torch which could drip and possibly cause a fire;
- (f) if the oil does not light immediately, the fuel supply should be turned off and the furnace ventilated by allowing air to blow through for two or three minutes to clear any oil vapour before a second attempt to light is made. During this interval the burner should be removed and the atomizer and tip inspected to verify that they are in good order;
- (g) if there is a total flame failure while the burner is alight, the fuel supply should be turned off.

15.8.3 The avenues of escape from the boiler fronts and firing spaces should be kept clear.

15.8.4 Where required to be fitted, the gauge glass cover should always be in place when the glass is under pressure. If a gauge glass or cover needs to be replaced or repaired, the gauge should be shut off and drained before the cover is removed.

15.9 Unmanned machinery spaces

15.9.1 Personnel should never enter or remain in an unmanned machinery space alone, unless they have received permission from, or been instructed by the engineer officer in charge at the time. They may only be sent to carry out a specific task which they may be expected to complete in a comparatively short time. Before entering the space, at regular intervals whilst in the space and on leaving the space, they must report by telephone, or other means

provided, to the duty deck officer. Before they enter the space the method of reporting should be clearly explained. Consideration should be given in appropriate instances to using a 'permit-to-work' (see section 16.2).

15.9.2 If it is the engineer officer in charge who enters the machinery space alone, he too should report to the deck officer.

15.9.3 Notice of safety precautions to be observed by personnel working in unmanned machinery spaces should be clearly displayed at all entrances to the space. Warning should be given that in unmanned machinery spaces there is a likelihood of machinery suddenly starting up.

15.9.4 Unmanned machinery spaces should be adequately illuminated at all times.

15.9.5 When machinery is under bridge control, the bridge should always be advised when a change in machinery setting is contemplated by the engine room staff, and before a reversion to engine room control of the machinery.

15.10 Refrigeration machinery

15.10.1 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.

15.10.2 No one should enter a refrigerated compartment without first informing a responsible officer.

15.10.3 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.

15.10.4 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, it should be ventilated to the fullest extent practicable and the personnel entering should wear approved breathing apparatus. A person should be stationed in constant attendance outside the space, also with breathing apparatus (see Chapter 17).

15.11 Scaffolding

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15.11.1 Annex B (reproduced from MGN 410) gives further guidance.

15.11.2 Only scaffolding of an approved design should be used or one rigged in conformity with a generally recognised configuration. If necessary a calculation of its strength should be carried out and recorded.

15.11.3 Care should be taken when assembling and dismantling the scaffold.

15.11.4 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 it cannot inadvertently move while in use.

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

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

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