



Australian Government

Australian Maritime Safety Authority

GUIDELINES FOR THE MEDICAL EXAMINATION of seafarers and coastal pilots



October 2016

How to use these guidelines

These guidelines should be read in full, at least once, at the time of issue. When a seafarer presents for a medical:

1. Refer to the relevant job task analysis in Annex 1 of these Guidelines.
2. Examine the person and note any abnormalities on either history or physical examination.
3. If any abnormalities are detected, refer to the appropriate section in the guidelines.
4. Complete the Medical Examination Report, Certificate of Medical Fitness and make appropriate follow-up and referral arrangements for seafarers found to be temporarily or permanently unfit for duties.

The accuracy of AMSA qualifications data base is extremely important. AMSA requests the Medical Inspector confirm with the seafarer the correct spelling of his/her family name and given names. It also greatly assists AMSA if the seafarer is able to provide their AMSA Seafarer ID number (PIN).

Contents

Part A Seafaring and Medical Fitness	5
1. Introduction	5
1.1 Why is fitness important?	5
1.2 The work environment of seafarers	6
2. Procedures	7
2.1 Frequency of health assessments	7
2.2 Confidentiality	7
2.3 Health assessment outcomes	7
3. Forms	8
Part B Medical Standards	9
1. Overview	9
2. Obesity	9
2.1 Body morphology	9
3. Eyes / vision	10
3.1 Visual acuity	10
3.2 Colour vision	10
4. Hearing, ear, nose and throat conditions	12
4.1 Hearing standard	12
4.2 The conduct of the conversation test	12
4.3 Other ear, nose and throat conditions	13
5. Cardiovascular system	13
5.1 Ischaemic heart disease	13
5.2 Dysrhythmia/pacemaker	13
5.3 Valvular heart disease	14
5.4 Cardiomyopathy	14
5.5 Aneurysms	14
5.6 Hypertension	14
5.7 Congenital heart disease	15
5.8 Peripheral circulation	15
5.9 Pulmonary circulation	15
6. Respiratory system	15
6.1 Pneumothorax	15
6.2 Asthma	15
6.3 Reduced lung function	16
6.4 Tuberculosis	16
6.5 Chest X-rays	16

7.	Gastrointestinal system	16
7.1	Teeth and gums	16
7.2	Peptic ulcer	16
7.3	Liver and pancreas	17
7.4	Gall bladder disease	17
7.5	Hernia	17
7.6	Colostomies	17
7.7	Enteric diseases	17
8.	Genitourinary	17
8.1	Pregnancy	18
9.	Neurological System	19
9.1	Epilepsy	19
9.2	Migraine	19
9.3	Stroke	19
9.4	Transient ischaemic attacks (TIAs)	19
9.5	Neuromuscular Disorders including Multiple Sclerosis, Parkinsonism	20
9.6	Memory and Cognitive Function	20
10.	Psychiatric conditions	20
11.	Prescribed medication, drugs and alcohol	21
11.1	Prescribed and over-the-counter drugs	21
11.2	Illegal drugs	22
11.3	Alcohol	22
12.	Musculoskeletal, balance and coordination	23
13.	Diabetes and other endocrine disorders	24
13.1	Diabetes mellitus	24
13.2	Thyroid disease	24
13.3	Adrenal disease	24
14.	Skin disorders	24
14.1	Infections	24
14.2	Dermatoses	24
15.	Haemopoietic disease	25
16.	Infectious diseases	25
17.	Neoplasms	25
18.	Assessment of older seafarers	26
	Annex 1 Job task analyses	27
	Annex 2 Guidance in screening for colour vision	33
1.	Need for good colour vision	33
2.	Tests	33
3.	Ishihara Test	33
4.	Holmes Wright Type B Lantern Test	34
4.1	Standard	34
5.	Farnsworth D15 test	35

Part A Seafaring and Medical Fitness

1. Introduction

Marine Orders, Part 9 (Health – medical fitness) is administered by the Australian Maritime Safety Authority. Part 9 makes provision for the issue of Certificates of Medical Fitness for duty at sea of seafarers and coastal pilots and gives effect to regulation 1/9 of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW) and Regulation 1.2 of the Maritime Labour Convention 2006.

These guidelines have been compiled for the use of Medical Inspectors who are assessing an individual's fitness to work at sea. The medical fitness standards have been developed in relation to the basic job task analyses in Annex 1 to these Guidelines.

An employing company may have more stringent guidelines developed by its own occupational physician. Such guidelines will depend on the nature of the jobs and any specific equipment operated. If an owner of a vessel has additional fitness requirements for particular duties or voyages (e.g. for the handling of specific cargoes or voyages to the Antarctic), the owner should advise the medical Inspector of those requirements and request a supplementary report against them.

While the final judgement on whether or not an applicant is fit to work in a particular job at sea rests with the Medical Inspector, these guidelines draw attention to those conditions that have the potential to present a high level of risk in some circumstances.

1.1 Why is fitness important?

- 1.1.1 Employers have a duty of care to provide a safe work environment and protect the health, safety and welfare of employees. Employees similarly have a duty of care for their own safety and that of the people they work with and the community. Medical assessment of fitness is one aspect of meeting this duty of care.
- 1.1.2 The primary objectives of a medical assessment of fitness for duty at sea are:
 - to ensure that individuals are fit to perform the essential tasks of their job at sea effectively and
 - to anticipate and, where possible, prevent the avoidable occurrence of ill-health offshore which could place individuals, their colleagues and emergency personnel at risk.
- 1.1.3 Medical conditions may impinge on work in the following areas:
 - (a) the condition may limit, reduce or prevent an individual from performing the job effectively e.g. loss of mobility and dexterity making engine room work and other maintenance tasks difficult;
 - (b) the condition may be made worse by the job e.g. an asthmatic exposed to allergens on a grain ship;
 - (c) the condition may make it unsafe for the person to do the job e.g. liability to sudden loss of consciousness whilst transferring from a smaller vessel to a larger vessel by climbing a rope ladder;
 - (d) the condition is likely to make it unsafe both for the individual and other crew e.g. a ships crane operator liable to sudden loss of consciousness; catering crew with infectious hepatitis or gastro- enteritis;
 - (e) the condition is likely to make it unsafe for other shipping e.g. a master or deck officer who is at risk of sudden loss of consciousness due to a cardiac arrhythmia; and
 - (f) the condition, if it worsens, is one which will require emergency evacuation for medical treatment e.g. gastric ulcer haemorrhage.

1.2 The work environment of seafarers

- 1.2.1 Medical Inspectors should bear in mind the aspects of seafaring life, listed below, when assessing fitness for duty at sea.
- 1.2.2 As ships often operate far offshore or in inaccessible areas it is often difficult to replace seafarers who become injured or ill. Many ships have only the minimal number of persons on board necessary to operate the ship; thus the incapacitation of even one seafarer may place a substantial additional burden on his or her shipmates.
- 1.2.3 Ships' officers generally receive basic first-aid and other medical training, and ships are usually equipped with basic medical supplies. Nevertheless, it is often quite difficult to transport sick or injured seafarers ashore where they can be treated by qualified physicians. In some geographical areas, the closest medical care ashore may be well below the standard of the seafarer's home country.
- 1.2.4 It is therefore inadvisable and often unsafe to allow persons with certain medical conditions to become seafarers or to return to seagoing employment.
- 1.2.5 Seafarers live close to each other at sea, often for long periods. Contagious diseases therefore may be a serious threat, endangering not only the health of other seafarers but also the safety of the ship and, where carried, passengers. It is particularly important that seafarers concerned with the preparation of food do not suffer from conditions which may be transmitted to others through their work.
- 1.2.6 Seafarers should be medically fit to perform their normal duties correctly and to be able to respond to emergency situations (e.g. fighting fires, lowering lifeboats, assisting passengers).
- 1.2.7 Seafarers should be able to adjust to the often violent motions of the ship, to be able to live and work in sometimes cramped spaces, to be able to climb ladders, to lift heavy weights and to be able to withstand exposure to harsh weather conditions on deck or excessive heat in the machinery spaces. Seafarers whose work requires travel to distant ports or workplaces by air should not suffer from conditions which are exacerbated by air travel.
- 1.2.8 Seafarers should be able to live and work closely with the same people for weeks and perhaps months on end and under occasionally stressful conditions. They should be capable of dealing effectively with isolation from family and friends and, in some cases, from persons of their own cultural background.
- 1.2.9 Shipping operations and shipboard duties vary substantially. For a fuller understanding of physical demands of particular categories of work on board ship, the Medical Inspector should consult the employer.

2. Procedures

2.1 Frequency of health assessments

- 2.1.1 All seafarers and coastal pilots should be assessed as to medical fitness for duties at sea:
- less than 18 years of age: annually.
 - 18 - 55 years of age: two-yearly.
 - over 55 years of age: annually with resting ECG (stress ECG, if in safety critical job and clinically indicated).
 - if there is a change in the medical condition of the employee.
 - after prolonged sickness absence of 3 months or more due to injury or illness.
- 2.1.2 A Certificate of Medical Fitness may be issued for less than the full period if the Medical Inspector considers it appropriate.

Note: An example might be where a Medical Inspector considers that a person, although fit at the time of the examination, needs to be re-examined to determine the continued efficacy of treatment for a condition.

2.2 Confidentiality

- 2.2.1 What information goes to the employer, AMSA and the seafarer?
- 2.2.2 The applicant/seafarer must receive the original Certificate of Medical Fitness and may receive a copy of the Medical Examination Report on request. A copy of the Certificate of Medical Fitness and the original Medical Examination Report should be forwarded to the Sonic Health Plus seafarer administration team.
- 2.2.3 The Medical Inspector (or successor) should keep copies of all the forms associated with the medical examination, including results of investigations in a confidential file, for a period of at least 30 years. This information is not to be released to any person, agency or employer without a signed consent form or as required by law.

2.3 Health assessment outcomes

- 2.3.1 An applicant or seafarer is either fit for the intended duties at sea, fit for restricted duties or unfit.
- 2.3.2 If fit for duties with limitations or restrictions the Medical Inspector must clearly outline the limitations on the Certificate of Medical Fitness.
- 2.3.3 Those declared unfit may be temporarily or permanently unfit.
- 2.3.4 If temporarily unfit, the Medical Inspector should specify a minimum period after which the assessment can be reviewed.

3. Forms

The form of the Certificate of Medical Fitness is an AMSA 303. These forms come in triplicate pads and should be provided to Medical Inspectors by Sonic health Plus. Other forms that may be found useful are available from the AMSA web site at www.amsa.gov.au.

Part B Medical Standards

1. Overview

This section provides information and guidance on medical conditions which may affect individuals in the safe performance of their duties at sea.

These medical standards attempt to be specific and give examples of tasks/jobs which may be affected. The standards cannot cover every clinical situation and the Medical Inspector should exercise judgement in relation to the key objective - maintaining safety at sea. For example, could the condition cause sudden loss of control of a ship, or sudden loss of consciousness when working at heights, or interfere with the performance of emergency duties?

Medical Inspectors should make a comprehensive medical assessment of overall health in the knowledge that errors or omissions of a critical task in some jobs can lead to serious consequences in terms of human health and life, environmental impact and/or major property loss.

The critical time needed for treatment/access to appropriate land-based care is also a consideration when determining fitness.

Medical Inspectors should consider what medical conditions could increase the probability of poor performance of critical tasks, and the probability and severity of the consequences when determining "Is this applicant medically fit for duty at sea?"

2. Obesity

2.1 Body morphology

- 2.1.1 As obesity can hamper evacuation procedures, persons with a Body Mass Index (BMI) of more than
- 2.1.2 30 kg/m² should be able to demonstrate that they can climb ladders and fit through hatches and not exceed safety limits for rescue equipment. Larger individuals face increased physical hazards and demands in a marine environment. Where there is doubt concerning physical abilities a functional assessment could be performed by an Occupational Physician or an Occupational Therapist either in a suitably equipped office or on board ship. The testing should assess the main functions of lower limb agility, the ability to climb multiple steps, balance and upper limb and handgrip strength. The ability to negotiate doorways and hatches can also be assessed in relation to standard dimensions.
- 2.1.3 A BMI of more than 40 kg/m² presents increased risk of ill health and injury. The issue of concern in overweight seafarers is primarily safe mobility around a ship, the ability to move quickly in an emergency and to be able to move through standard hatches.

Note: Applicants in this category may need to undertake weight reduction and be reassessed. It should be noted that obstructive sleep apnoea is more common in those with morbid obesity, as are diabetes and hypertension.

Note: A figure of BMI greater than 40 alone cannot be used as a predictor of safety, health or functional ability to work but should trigger greater scrutiny of functional capacity and ability to move safely on a ship.

3. Eyes / vision

3.1 Visual acuity

- 3.1.1 Far vision is required for:
- (a) lookout duties; and
 - (b) control of ships, ships' small craft and cranes.
- 3.1.2 Near vision is required to read charts, weather maps, computer screens, monitors and instructions.
- 3.1.3 Night and depth vision are required for lookout duties and control of the ship; (depth vision is especially important for operating cranes at close distances).

3.2 Colour vision

- 3.2.1 Good colour vision is required for bridge watchkeeping and lookout duties to distinguish red and green port and starboard channel markers, navigation beacons and ships' navigation lights. The ability to identify red, green and white navigation lights is an essential part of the job for coastal pilots, masters, deck officers and ratings required to perform lookout duties. Deck officers, Ratings and engineering staff have important requirements for safe red green colour discrimination in their specified job categories.
- 3.2.2 Impaired colour vision presents a risk to Engineering and Electro-technical officers and ratings who may be required to distinguish the colour of electrical wiring in order to make proper electrical connections. As such, it presents a risk depending on the degree of impairment that may affect a person's ability to perform his duties.
- 3.2.3 The primary screen is the Ishihara Pseudoisochromatic Plate testing. If this is passed the standards are met and a seafarer is considered colour vision safe for deck and engine room duties. If a seafarer (deck or integrated rating) passes either an Ishihara screen or a Holmes Wright Lantern Type B (HWB) test they are considered red-green colour safe for watchkeeping and lookout duties at night. (Visual acuity requirements must also be met.) If a person passes either an Ishihara screen or a Farnsworth D15 colour vision matching test he or she is considered red- green colour safe for all engine room tasks.
- 3.2.4 Notwithstanding the above, Engineers and Integrated Ratings who fail the above colour vision tests may provide evidence from a relevant employer that, within the last two years, impaired colour vision, if present, has not been found to affect their work. Medical Inspectors should consider this evidence when making their findings and attach such evidence to the Medical Examination Report.
- 3.2.5 When testing colour vision, coloured lenses should not be worn by the seafarer.

Note: The wearing of contact lenses or spectacles with chromagen lenses with red filters will increase the contrast of greens, yellows & browns, thus enabling a colour deficient seafarer to pass the Ishihara test. However, these lenses are not sufficient to enable safe lookout duties at sea.

3.2.6 Information regarding colour vision impairment must be provided on the Certificate of Medical Fitness to assist the employer to make an appropriate decision regarding engagement or continued employment.

Note: Guidance on appropriate screening for colour vision is contained in Annex 2 of these Guidelines.

3.2.7 Any eye disease, disorder or defect which affects colour vision needs to be corrected.

3.2.8 In all cases, where visual aids (spectacles or contact lenses) are required for the efficient performance of duties, a spare pair must be carried when seafaring. When different visual aids are used for distance and near vision a spare pair of each must be carried.

3.2.9 A history of glaucoma or uveitis needs ophthalmological assessment.

3.2.10 The vision standards listed in Table 1 are those for seafarers on Australian vessels.

Table 1: Visual standards

	Distant vision			Near vision ^(a)	Colour vision	Visual fields
	Better eye not less than	Other eye ^(a) not less than	Both eyes not less than			
Deck department						
1. Seafarers required to undertake watchkeeping duties: (aided vision if necessary)	6/6	6/9	6/6	N8 for charts, weather maps and N12 for other reading tasks with or without visual aids	Normal ^(a)	Normal visual fields
2. Seafarers required to operate lifting plant e.g. ships' cranes, hoists: (aided vision if necessary)	6/9	6/12	6/9	N12 with or without visual aids	Distinguish red ^(b)	Normal visual fields
3. Seafarers not required to undertake duties in 1 or 2: (aided vision if necessary)	6/18	6/60	6/18	N12 with or without visual aids	N/A	Sufficient visual fields
Other departments						
Engine room (includes electrician): (aided vision if necessary)	6/12	6/60	6/12	N12 to read instruments, gauges on control panels	See Annex 2	Sufficient visual fields
Catering department: (aided vision if necessary)	6/12	6/60	6/12	N12 to read instructions and catering equipment control panels	Not required	Sufficient visual fields

Note: a) See Annex 2

b) It is sufficient if the applicant can distinguish red from other colours. See Annex 2.

4. Hearing, ear, nose and throat conditions

4.1 Hearing standard

- 4.1.1 Hearing is required for communication by radio, by telephone or person to person and therefore the critical frequencies are in the speech range 500 to 3,000 Hz.
- 4.1.2 Hearing loss for new entrants should be checked by means of an audiogram. If the new entrant uses a hearing aid, the person should be referred to an audiology specialist unless evidence is produced of recent testing and hearing using the aid is apparently satisfactory.
- 4.1.3 For existing seafarers, an audiogram is only required if hearing is not apparently satisfactory in one to one conversation. Additionally, those seafarers wearing hearing aids who have unsatisfactory hearing in normal conversation should have their hearing aid checked by the supplier and may also require a practical test to assess functional hearing.
- 4.1.4 The speech must be reasonably clear and free of stutter and hesitation sufficient to use radios and communicate on deck. Those using cranes must be able to hear whistle signals where these are used.
- 4.1.5 A functional hearing loss sufficient to interfere with communication or to impede safety (e.g. hearing audible warning devices) presents a high risk.

Table 2: Minimum Standards of hearing for Deck and Engine Departments

	Frequency Hz			
	500	1,000	2,000	3,000
dB loss in better ear without aids	40	40	40	40

- 4.1.6 If hearing loss is 40dB or more at the frequencies specified in Table 2, ability to use a radio will need to be demonstrated. In this circumstance the applicant must pass a conversation test.

4.2 The conduct of the conversation test

- 4.2.1 The following is a recommended procedure for conduct of a conversation test.
- 4.2.2 The test should be conducted in a quiet room with a stable background noise level. Hearing aids should be worn if normally used at work or if retesting following their fitting.
- 4.2.3 The examiner should face the subject and address him/her from a distance of 3 metres for normal speech.
- 4.2.4 The subject should be seated facing away from the examiner to preclude lip reading and the use of non-verbal clues.
- 4.2.5 A normal conversational vocal volume should be used.
- 4.2.6 The test material should be a mixture of alphabetical letters and numerals in any order, not to exceed a total of three in any one phrase, e.g. 6Y3, 2N4, S5G, 7BL.
- 4.2.7 Ten combinations should be used, each preceded by the carrier phrase "PLEASE SAY".
- 4.2.8 The subject should repeat what was thought to be heard. If uncertain, guessing is encouraged.
- 4.2.9 Six or more combinations should be repeated without error to be considered satisfactory.
- 4.2.10 Applicants who do not pass this test should be referred for further assessment of functional hearing and speech discrimination by an audiologist.

4.3 Other ear, nose and throat conditions

- 4.3.1 Acute infections require treatment. Although chronic middle ear disease presents a high risk, recurrent or chronic sinus infection presents less of a risk if the Medical Inspector is satisfied that the seafarer can manage the condition with appropriate medication at sea.
- 4.3.2 Vestibular malfunction can occur suddenly and with sufficient severity to make safe operations of vessels and cranes impossible. It may be accompanied by nystagmus which compounds the disability. Meniere's disease therefore presents a high risk.
- 4.3.3 Hay fever which responds to therapy (without side effects) presents a lower level of risk.
- 4.3.4 Frequently recurring tonsillitis presents a high risk until corrected.

5. Cardiovascular system

Cardiovascular conditions can cause sudden loss of consciousness putting others at risk or interfere with exercise tolerance as in climbing or working in confined spaces. Some cardiovascular conditions, if they become acute, can require immediate emergency medical care or medical evacuation, neither of which may be available, particularly in remote locations and/ or in bad weather.

Careful assessment is required to ensure applicants are free of any cardiovascular condition which puts themselves or others at risk. Seafarers 55 years and over, or those with a history of cardiovascular disease, will require a resting ECG. A stress ECG may be performed if clinically indicated.

5.1 Ischaemic heart disease

- 5.1.1 Current angina presents a high risk. Any occurrence within the previous 3 months of confirmed myocardial infarction, coronary artery bypass grafting, coronary angioplasty or stent presents a high or increased risk.
- 5.1.2 A lower risk is presented if the seafarer has had no symptoms of coronary artery disease for more than 3 months and there is good control of risk factors with no medication for angina control necessary. Review should be by a cardiologist using results of tests, e.g. angiogram, stress ECG. Advances in coronary stenting now mean that individuals successfully treated with stenting and free of cardiac symptoms could be considered medically safe to return to sea within 3 weeks subject to specialist opinion from their cardiologist.
- 5.1.3 Any doubt about medical fitness to return to work at sea should be referred to a specialist cardiologist.
- 5.1.4 If the review finds that 3 months or more has elapsed since the last symptom incident, there are no signs of ischaemia on the exercise ECG (less than 2mm ST segment depression) and/ or coronary angiography shows a lumen reduction of less than 70per cent in a major coronary branch and less than 50per cent in the left main coronary artery, and the ejection fraction is 50per cent or more, the seafarer could be declared fit for duty at sea but with annual or more frequent cardiological review highly recommended.

5.2 Dysrhythmia/pacemaker

- 5.2.1 A history of recurrent or persistent dysrhythmia which may result in syncope or incapacitating symptoms presents a high risk.
- 5.2.2 A seafarer who has had surgery (e.g. for Wolf- Parkinson White syndrome), or successful treatment by medication for at least 3 months, may be declared fit subject to annual cardiological review.

- 5.2.3 If the seafarer has had a pacemaker implanted and the Medical Inspector has taken into account the nature of the person's underlying disease and is satisfied that the pacemaker function has been appropriately tested, the seafarer may be declared fit subject to 6-monthly testing at a pacemaker clinic and cardiological review.

Note: Some ships have strong electro-magnetic fields near communications equipment and aerials which may affect pacemaker function.

5.3 Valvular heart disease

- 5.3.1 A history or evidence of valve disease, associated with symptoms or a history of, embolism, arrhythmia, cardiac enlargement (on chest X ray), abnormal ECG, or high blood pressure presents a high risk.
- 5.3.2 Taking anticoagulants is acceptable if the dosage has been stable over time and monitoring of the blood is compatible with swings.
- 5.3.3 A seafarer may be considered fit for duty at sea if cardiological assessment shows mild or treated valvular disease of no haemodynamic significance, and it is not associated with any symptoms, and any monitoring of the condition can be done at frequencies compatible with swings.
- 5.3.4 Equivocal cases should be referred to an independent medical panel.

5.4 Cardiomyopathy

- 5.4.1 Established cardiomyopathy presents a high risk.
- 5.4.2 A heart or heart/lung transplant presents a high risk.

5.5 Aneurysms

- 5.5.1 A history of an aortic aneurysm, thoracic or abdominal, either before or after surgery presents a high risk.

5.6 Hypertension

- 5.6.1 Blood pressure (taken whilst seated) of 160/100 or greater (treated or untreated) presents a high risk.
- 5.6.2 End organ damage (cardiac, cerebral, retinal or renal) which would impair safe operation of ships, cranes or small craft presents a high risk.
- 5.6.3 Any medical condition that requires the use of medication which can result in marked hypotension or impaired alertness which would cause distraction of attention whilst operating a ship, crane, or small craft presents a high risk.
- 5.6.4 A Certificate of Medical Fitness for duty to sea may be issued:
- initially if the seafarer is treated with anti- hypertensive drug therapy and effective control of hypertension is achieved (not greater than 150/95) without appreciable side effects over a four week period, subject to annual review;
 - where blood pressure control (not greater than 150/95) has been achieved and is stable for 2 years and well documented and is likely to continue, 2 yearly reviews are appropriate;
 - if there is no evidence of target organ damage, associated ischaemic or other forms of heart disease; and
 - if other causative risk factors have been addressed.

5.7 Congenital heart disease

- 5.7.1 Congenital heart disease (e.g. atrial septal defect, small ventricular septal defect) without symptoms and with no haemodynamic significance may be acceptable.

5.8 Peripheral circulation

- 5.8.1 Current or recent history of deep vein thrombosis with or without embolisation presents a high risk. Varicose veins associated with ulcers or other complications presents a high risk.
- 5.8.2 Peripheral vascular disease with intermittent claudication presents a high risk.

5.9 Pulmonary circulation

- 5.9.1 A history of more than one pulmonary embolus presents a high risk. A single episode requires careful assessment of the underlying cause and risk of recurrence.

6. Respiratory system

Disorders of the respiratory system should be considered in the context of the risk of an acute exacerbation requiring emergency medical treatment (e.g. asthma, pneumothorax) or symptomatic airway disease sufficient to reduce capacity for physical work or ability to wear a respirator. Ability to wear a respirator may be required in ships carrying cargoes of grain or cement, or oil tankers and ships carrying chemical cargoes.

6.1 Pneumothorax

- 6.1.1 A history of recurrent pneumothorax presents a high risk. A single episode without recurrence for a year, or after successful surgical correction is acceptable.

6.2 Asthma

- 6.2.1 Asthma, chronic obstructive or restrictive airways disease and emphysema affect the ability of an individual to use self-contained breathing apparatus, and to wear respirators. Persons with asthma or allergy may find working on grain ships affects their respiratory function.
- 6.2.2 Asthma requiring oral corticosteroids and/or frequent medication presents a high risk.
- 6.2.3 A history of childhood asthma subsequently resolved in adolescence is acceptable.
- 6.2.4 Well-controlled asthma on inhaled corticosteroids and intermittent need of bronchodilators may be acceptable. A report from the seafarer's treating physician may be required.

Note: There are persons with mild asthma whose symptoms are precipitated by obvious causes such as a respiratory tract infection and there are persons who can suddenly develop life-threatening asthma requiring hospitalisation. The latter have an asthma which is often more difficult to control and an obvious precipitating factor may not be identified for each asthma attack. This sub-group of asthmatics presents a high risk.

6.3 Reduced lung function

- 6.3.1 Severe respiratory disorders are associated with reduced physical effort tolerance. This can interfere with the safe operation of ships and cranes and confined space work through inadequate oxygen and/ or increased carbon dioxide to the brain and heart, leading to poor judgement, agitation or drowsiness, reduced concentration and cardiac effects such as right heart failure or arrhythmia.
- 6.3.2 For jobs requiring the use of a respirator because of entry into confined spaces or for work on grain and cement ships, an FEV₁ below 65 per cent, FVC below 70 per cent and/or FEV₁/FVC less than 70 per cent are grounds for concern. A practical respirator assessment should be requested if wearing respirators is an essential task requirement.
- 6.3.3 In some cases of reduced lung function, individuals who get dyspnoea on exertion may find climbing ladders on ships too difficult. A person who is unable to keep pace with people of the same age and body build when walking on level ground or who has dyspnoea on one flight of 10-12 stairs will have difficulty climbing stairs and ladders, climbing over plant and equipment, and walking reasonable distances on board ship. If in doubt a practical test should be requested.

6.4 Tuberculosis

- 6.4.1 Untreated tuberculosis or other serious infection presents a high risk. Where the applicant has suffered tuberculosis or other serious lung infection, a letter from the treating physician should be obtained to certify that the seafarer is no longer infectious.

6.5 Chest X-rays

- 6.5.1 A chest X-ray is required at entry i.e. for pre-sea medicals and may be required where there is a history of tuberculosis, or pneumothorax and/or when clinically indicated. There is no requirement for routine chest X rays.

7. Gastrointestinal system

7.1 Teeth and gums

- 7.1.1 Seafarers must be dentally fit as, other than temporary pain relief, there is no dental treatment aboard ship. Dental abscesses or severe gingivitis presents a high risk. Seafarers with impacted wisdom teeth may need dental review.
- 7.1.2 Medical Inspectors are to inspect and evaluate the general health of teeth and gums and advise if obvious major dental work is required. To avoid delays in fitness certification pending dental treatment a seafarer could be given a provisional temporary certificate to allow time for dental work to be carried out with a review in not more than 4 months.

7.2 Peptic ulcer

- 7.2.1 Acute peptic ulceration presents a high risk. However treated peptic ulceration is acceptable provided that the Medical Inspector is satisfied that the risk of recurrence, especially haemorrhage, is minimal. A letter from the treating physician, together with endoscopy report, may be required.

7.3 Liver and pancreas

- 7.3.1 A history of recurrent or chronic pancreatitis presents a high risk. Serious or progressive liver disease such as cirrhosis with complications of oesophageal varices presents a high risk.

7.4 Gall bladder disease

- 7.4.1 A person with a history of cholelithiasis and/or cholangitis should be carefully evaluated for the risk of recurrence before being accepted as fit for duty at sea.

7.5 Hernia

- 7.5.1 An inguinal hernia presents a high risk with physical effort and manual handling unless surgically corrected. An exception is an applicant who has a small inguinal hernia where there is no risk of strangulation and where there is surgical opinion to state that there is no clinical indication for surgery may be determined as fit for lifting tasks.
- 7.5.2 A rectus divarification or large umbilical hernia should be surgically corrected before applicants can be accepted as fit for lifting tasks.
- 7.5.3 A diaphragmatic hernia without disabling reflux oesophagitis or other symptoms is acceptable.

7.6 Colostomies

- 7.6.1 A person with an uncomplicated stoma is acceptable provided that the underlying cause is compatible with work offshore and there are adequate facilities for changing colostomy bags on board ship.

7.7 Enteric diseases

- 7.7.1 Catering crew should be free of infectious enteric diseases, including hepatitis A.
- 7.7.2 Catering crew and those who may be exposed to sewage (e.g. engineers maintaining sewage treatment plants) require evidence of a completed course of active hepatitis A immunisation on employment.

8. Genitourinary

Any person who has haematuria and/or protein on urinalysis should be carefully assessed to exclude any condition which may suddenly worsen and require urgent medical attention, e.g. renal calculi.

A history of renal calculi requires advice on fluid intake in hot weather. The presence of untreated renal calculi presents a high risk.

Urinary incontinence presents a high risk.

A large untreated hydrocele presents a high risk. A small symptomless hydrocele is acceptable.

Prostatism, due to prostatic hypertrophy sufficient to cause urinary symptoms such as frequency or poor stream, presents a high risk until treated due to the risk of acute urinary retention.

Menstrual dysfunction which can lead to incapacitating pain or haemorrhage, e.g. severe endometriosis, unpredictable or severe bleeding or menorrhagia presents a high risk.

8.1 Pregnancy

- 8.1.1 Normal pregnancy carries increased critical health risks and also has an impact on the ability to perform work at sea.
- 8.1.2 The normal risks of pregnancy can be managed routinely on shore but present enhanced problems in a marine environment where antenatal, medical and obstetric care, are not available.
- 8.1.3 Work at sea also involves physical effort and endurance, manual handling, standing for extended periods of time, requirements for safe physical movement and shift work. Many of these factors have been associated with an increased risk of spontaneous pregnancy loss.
- 8.1.4 Normal pregnancy also affects ability for work duties at sea because of:
- the risk of hypotension, especially in hot weather;
 - the risk of falls due to the change in the centre of gravity and balance;
 - difficulty climbing because of increased abdominal girth and additional cardiovascular load;
 - nausea from 'morning sickness' which may be exacerbated by sea-state conditions; and
 - reduced tolerance of physical effort and manual handling.
- 8.1.5 The adverse impact of these factors on agility, safe movement and reduced tolerance of physical effort and manual handling increases especially through the second and third terms of pregnancy.
- 8.1.6 Antenatal and obstetric care is not available at sea, and a miscarriage (pregnancy loss) could be life threatening through risks of haemorrhage and infection.
- 8.1.7 Miscarriage occurs in approximately 15 per cent of recognised pregnancies with a peak incidence in the first 12 weeks. However pregnancy loss occurs at lesser rates throughout the second and third terms of pregnancy. Pre-term births prior to 28 weeks represent 1 per cent of births, rising to 6 per cent between 28 and 37 weeks. Even a normal term birth at sea carries increased risk of avoidable ill health and death for mother and child.
- 8.1.8 Pregnancy has increased risks throughout the whole period, but this in itself is not sufficient justification for exclusion from work at sea in the first two trimesters. Cases should be considered individually seeking a balance of risk and duty of care.
- 8.1.9 Female maritime workers should be given accurate medical risk information to assist them with informed decision making in relation to pregnancy and work at sea.
- 8.1.10 Pregnancy therefore presents a high risk except for a woman with a previous uncomplicated pregnancy, who is less than 28 weeks in to her pregnancy and who works on short coastal runs only. A report from the treating obstetrician should be obtained.

9. Neurological System

Sudden loss of consciousness or loss of control of limbs or balance impairs the ability to control a ship, ship's small craft or a crane, and to work at heights or alone.

9.1 Epilepsy

- 9.1.1 Epilepsy can be affected by fatigue. Shift work can therefore exacerbate the condition if a person fails to get adequate sleep. Confirmed or current epilepsy, with a fit within the previous 2 years, presents a high risk.
- 9.1.2 For seafarers with well-controlled epilepsy, evidence of treatment and control of epilepsy (e.g. letter from treating specialist) must be provided for the condition to be acceptable.

Note: Although only about one-third of patients with a first unprovoked seizure will have further seizures within 5 years, about 75per cent of those with two or three unprovoked seizures have further seizures within 4 years.

- 9.1.3 A past history of convulsions after the age of 5 years, with a seizure-free period of at least two years, and not requiring medication, should be carefully assessed.
- 9.1.4 A past, single seizure or cluster of seizures due to exceptional and non-repeatable circumstances (e.g. head injury with complete recovery) may be acceptable.

9.2 Migraine

- 9.2.1 Acute incapacitating attacks of migraine which may be accompanied by neurological signs such as hemiparesis and visual defects presents a high risk.
- 9.2.2 An established history of migraine which does not interfere with capacity to work safely is acceptable.

9.3 Stroke

- 9.3.1 A history of cerebrovascular accident generally presents a high risk. However depending on the degree of recovery from the stroke, and provided that problem solving skills and judgement have not been affected, a person may be considered fit for duty at sea after neuro-psychometric evaluation and a report from the treating neurologist / rehabilitation physician indicating that a recurrence is unlikely and that there is no significant, clinical residual disability.

9.4 Transient ischaemic attacks (TIAs)

- 9.4.1 If a cardiac cause for such episodes is found and treated, then any restriction should be based on the prognosis of that condition, and the likelihood of recurrences.
- 9.4.2 Where the aetiology of the attacks has been identified, the underlying cause removed, and a six- month period free of attacks has elapsed, the condition may be acceptable.
- 9.4.3 In such cases as outlined above, a review by a cardiologist/neurologist will be required.

9.5 Neuromuscular Disorders including Multiple Sclerosis, Parkinsonism

- 9.5.1 Parkinsonism, multiple sclerosis, or other neuromuscular disorders would preclude being in control of a ship, operating cranes or other equipment and, where the disability is any more than minor muscular weakness, can affect climbing ability on ship's rope ladders and steel rung ladders. Because of the progressive nature of most forms of neuromuscular disorder, these conditions generally present a high risk.
- 9.5.2 Drug induced Parkinsonism may disappear on cessation of the treatment. Should this occur, and the underlying case for which the drugs were administered not be a cause for exclusion in its own right, then the applicant may be considered fit for duty at sea.

9.6 Memory and Cognitive Function

- 9.6.1 Seafarers must be able to do their work tasks safely and efficiently without risk to themselves or others. Intact memory and cognitive function are reasonable health requirements for work at sea and completing efficient work tasks efficiently and safely. Problems with memory and cognitive function might occur with a number of disorders including prolonged high alcohol intake.
- 9.6.2 Where clinically indicated and in cases where reduced cognitive function or memory is suspected, brief screening with a clinical screening instrument such as the Montreal Cognitive Assessment (MoCA) (www.mocatest.org) is to be used. Seafarers who failed such an assessment would need further medical investigation, specialist review and re-examination.

10. Psychiatric conditions

Psychological and psychiatric conditions and personality difficulties may all affect the safety and well being of seafarers in a maritime work environment.

Affective disorders such as anxiety and depression affect judgement, attention and motor activity and the Medical Inspector should consider this in relation to any jobs with responsibility for the safe operation of ships, cranes and equipment, including emergency procedures. The Medical Inspector should also be aware that ship-board life involves periods of months away from home, family and other support mechanisms, including psychiatric support.

An acute episode of mental illness (e.g. schizophrenia, schizo-affective disorders, bipolar illness or other major psychiatric illness) or a chronic mental illness manifested by symptoms which indicate there is the likelihood of relapse such that the sufferer may cause harm to herself or himself or others, the ship or its cargo, presents a high risk.

A mental disorder requiring psychotropic drug therapy presents a high risk if the side-effects of such medication affect alertness, co-ordination, cause drowsiness or postural hypotension.

A present or past mental disorder affecting judgement or psychomotor ability presents a high risk.

Where the mental illness has been controlled and a report obtained from the treating psychiatrist to the effect that a recurrence is unlikely, the person may be considered fit, subject to regular review.

In all cases, where there is doubt about mental or psychological fitness, a specialist psychiatric assessment should be obtained and reviewed.

11. Prescribed medication, drugs and alcohol

Some prescription, over-the-counter, or illegal substances have the capability of altering vision, perception, judgement, attention span, motor function and other characteristics important in the safe operation of ships, cranes, lathes, and powered tools.

11.1 Prescribed and over-the-counter drugs

11.1.1 The main issues with these drugs in relation to fitness for duty at sea are:

- Can side-effects place the safety of the person or the safety of others at risk?
- Does the medication require monitoring?
- Is the underlying disease, for which the medication has been prescribed, compatible with working at sea?
- What is the likely effect of several missed doses if seasickness precludes taking or absorbing medication?

11.1.2 If the medication is for short term administration, the person may be considered as temporarily unfit and re-examined.

11.1.3 Long term administration of some medications may lead to tolerance of sedative side effects e.g. antihistamines. Once this has stabilised, the taking of medications per se is not a bar to operating plant and equipment. The Medical Inspector should be satisfied that the person does not suffer sedative side effects and is aware of the potentiation effects of interaction with alcohol.

11.1.4 The short or long term use of prescribed psychoactive drugs requires, at a minimum, strong warnings about the potentiation by alcohol. Where clinically appropriate it is desirable that alternative therapy, with non-psychoactive drugs if possible, is undertaken. Each case will need to be assessed individually and discussed with the person's treating practitioner. More frequent reassessment will be required.

11.1.5 Persons using anti-histamines should use those with the least sedative side-effects e.g. astemizole (Hismanal).

11.1.6 Cytotoxic agents, insulin, immunosuppressants and oral corticosteroids present a high risk.

11.1.7 Major tranquillisers, narcotics and hypnotics present a high risk. A previous history of such treatment will require further consideration.

11.1.8 Prescribed medication must be listed on the Medical Examination Report and Certificate of Medical Fitness. The applicant must be warned that he or she must have adequate medication to last a swing.

Table 3: Classes of drugs with potential to affect an individual's skills to operate ships, boats,

plant and equipment, including cranes

Class of drug	Examples
sedative, hypnotic or anti-anxiety agents	barbiturates benzodiazepines
analgesics	codeine narcotics propoxyphene
ophthalmic agents (topical)	most agents for treating glaucoma
anti-allergy agents	antihistamines
bronchodilators and asthma medications	salbutamol beclomethason dipropionate sodium cromaglycate budesonide
antibiotics	minocycline
antipsychotic or antidepressant agents	tricyclic anti-depressants haloperidol phenothiazines
anticonvulsants	sodium valproate phenytoin
anticoagulants	aspirin coumadin
antihypertensives	clonidine methyldopa reserpine
anti-motion sickness agents	antihistamines
unprescribed substances	alcohol amphetamines cocaine marijuana

11.2 Illegal drugs

- 11.2.1 Illegal drugs such as opiates, cannabis and amphetamines may reduce a person's ability to safely operate ships, cranes and machinery. Drug screening is not required for a Certificate of Medical Fitness, although individual employers may initiate drug and alcohol screening as part of company policy e.g. in the offshore oil industry. Such policies are beyond the scope of these guidelines and further information, if required, should be sought from the Australasian Faculty of Occupational Medicine and the Centre for Education and Information on Drugs and Alcohol (CEIDA).
- 11.2.2 Any use of illegal drugs presents a high risk.

11.3 Alcohol

- 11.3.1 Alcohol is implicated as a significant factor in work-related accidents. In general it is a statutory requirement that all persons, whilst on duty on a commercial vessel, have a zero blood alcohol level.
- 11.3.2 Chronic high alcohol intake (60g per day) impairs cognitive function such as the processing and handling of sensory information and reduces the speed and accuracy of response to psychomotor tasks. This may not become apparent until the person is in an emergency situation.
- 11.3.3 A person with a clear history and clinical evidence of chronic alcohol abuse, where there is evidence of end organ damage such as organic brain damage or hepatomegaly, presents a high risk.
- 11.3.4 A seafarer who has been diagnosed as suffering from alcoholism should not be considered as fit for duties at sea until a rehabilitation program has been completed and the Medical Inspector is satisfied that the seafarer is fit to return to service on a ship.

12. Musculoskeletal, balance and coordination

Normal mobility, agility and strength in the spine and all limbs are important for tasks involving climbing, lifting and confined space work.

Ships have steep stairs, rope ladders and vertical steel rung ladders which must be climbed and hatches which seafarers must negotiate.

Rough weather will increase the need for reasonable hip, knee and shoulder strength, flexibility and agility in relation to climbing.

The majority of lifting tasks are 25 kg or below and much use is made of lifting equipment (cranes and hoists, forklifts) both on ships and on shore. Lifting is harder to control in rough sea state conditions, during emergency procedures, when moving chains on deck, or when lifting and carrying in confined spaces.

The following conditions present a high risk:

- Amputation or congenital loss or acquired functional loss affecting an upper limb or lower limb if this affects climbing.
- Amputation or congenital loss or acquired functional loss of a lower limb if this is required to operate a foot control.
- Peripheral neuropathy resulting in loss of sensation or proprioception in the extremities as this makes climbing hazardous.
- Uncorrected knee instability e.g. locking, giving way.
- Uncorrected shoulder dislocation/ subluxation.
- Acute inflammation and pain in any joint which interferes with concentration or impairs the range of motion such that disembarking from a boat cannot be performed safely - the person may need to be re-examined at a later date.

The following conditions also present a high risk because they affect the ability to undertake manual handling, climb and occasionally maintain awkward postures in engine rooms and other confined spaces:

- Reduced range of movement or pain when rotating the neck - unable to look behind and/or up when operating plant, including cranes and hoists.
- Low back pain which affects activities of daily living and/or results in an inability to shovel, climb, maintain sustained and/or repetitive awkward postures.
- Painful spinal or shoulder movements with or without limitation in range of strength.

The Medical Inspector should carefully assess a person with a lower limb prosthesis (e.g. for a below-knee amputation). An office based or field agility test may be required to prove that rope ladders, steel rung ladders and ships stairs can be climbed, or alternatively evidence of satisfactory work performance at sea.

A person with a significant loss of range of motion or some loss of muscle power may also require an agility test.

Where there is any doubt about mobility, the Medical Inspector should arrange or ask for a practical test by contacting the referring employer.

13. Diabetes and other endocrine disorders

13.1 Diabetes mellitus

- 13.1.1 The Medical Inspector should bear in mind the risk to safety if the applicant had a hypoglycaemic attack or developed a ketacidotic coma.
- 13.1.2 In particular, attention is drawn to watch keeping duties as there may be periods when the Master or Mate is alone on the bridge and responsible for the safety of the ship e.g. whilst the Integrated Rating or Mate is doing a round of the ship.

Note: Insulin dependent diabetes mellitus is more difficult to manage for a person on rotating shift work. There is also the problem of administering optimal emergency care at sea to a person in a coma who may require urgent intravenous therapy.

- 13.1.3 The following conditions present a very high risk:
- Insulin dependent diabetes mellitus (IDDM).
 - Poorly controlled non-insulin dependent diabetes with unsatisfactory glucometer readings, high levels of glycosated haemoglobin and/or recurrent glycosuria.
- 13.1.4 Seafarers or applicants with a demonstrated responsible attitude to self-management of a diabetic condition and a report from their treating practitioner confirming adequate control of diabetes, lack of complications (ulcers, retinopathy, renal disease) and ability to work shift work without the risk of a hypoglycaemic attack, may be accepted.
- 13.1.5 If the person's diabetes is currently uncontrolled e.g. due to change in therapy, it may be necessary to consider him or her as temporarily unfit and subject to re-examination in three months.

13.2 Thyroid disease

- 13.2.1 Fitness for duties at sea will depend on the degree of control of thyroid disease, the absence of complications, especially cardiac, and the requirements for monitoring medication.

13.3 Adrenal disease

- 13.3.1 Disorders affecting adrenocortical hormone production such as Cushing's syndrome or Addison's disease present a high risk unless the underlying cause has been treated and the individual's adrenal function is sufficient.

14. Skin disorders

14.1 Infections

- 14.1.1 Contagious skin disease presents a high risk unless the disease has been treated and is no longer contagious.

14.2 Dermatoses

- 14.2.1 Mild endogenous eczema is acceptable but the Medical Inspector should be satisfied that the condition will not be aggravated by exposure to oils, detergents or other substances at work to a degree sufficient to render the applicant unfit for duty at sea.
- 14.2.2 Psoriasis, not associated with polyarthritis, is acceptable.

15. Haemopoietic disease

Routine blood tests are not required for assessing medical fitness unless clinically indicated, for example there are clinical signs of anaemia, lymphadenopathy, haemarthroses.

Coagulation disorders such as Factor VIII deficiency present a high risk because it will not usually be possible to treat an acute traumatic haemorrhage at sea with replacement of clotting factors.

Leukaemias and myeloproliferative diseases present a high risk.

Chronic lymphatic leukaemia if mild and asymptomatic may be acceptable.

16. Infectious diseases

Active infectious disease presents a high risk. Tuberculosis and contagious skin diseases are mentioned in the relevant sections.

Catering staff must be free of enteric diseases, including Hepatitis A. Staff responsible for catering crew and those exposed to sewage (e.g. engineers maintaining sewage treatment plants) should be actively and reliably protected against Hepatitis A virus infection. It is strongly recommended that these staff members receive a complete course of active immunisation before commencing work in these areas. Individuals who have previously had Hepatitis A will have lifelong immunity against re-infection and would not require active immunisation or booster doses of Hepatitis A vaccine.

Hepatitis B is a blood borne disease spread by exposure to contaminated blood. This might occur in any marine workplace where there is the potential for physical cuts and injuries associated with bleeding. It is strongly recommended that employer groups conduct hazard risk assessments in line with current best OHS practice and where appropriate to facilitate active vaccination against hepatitis B virus.

HIV testing is not routinely required and should not be done unless there is a clinical indication. Whilst a positive HIV test is not a bar to employment, yearly review may be appropriate. Evidence of AIDS (Acquired Immunodeficiency Syndrome) presents a variable but high risk.

Of particular concern are neurological or neuropsychiatric and other complications which would compromise safety. With contemporary community understanding and improved treatment of HIV disease these markers of advanced HIV infection are now rarely encountered but may present as the first sign of long standing untreated disease.

17. Neoplasms

Neoplasms of any type have the potential to disqualify an applicant or seafarer from duties at sea because of:

- Acute symptoms, e.g. hemianopia with pituitary tumours.
- Complications e.g. pulmonary emboli.
- Side-effects of treatment/medication, e.g. immunosuppression, anaemia, nausea.

Frank malignant disease presents a high risk. Seafarers should be carefully reassessed after a diagnosis of cancer is confirmed and treatment instituted. The natural history and prognosis of the neoplasm should be taken into account. The progress and likelihood of complications of the disease or its treatment must also be carefully evaluated.

18. Assessment of older seafarers

It is now common to encounter seafarers who work well beyond 65 years of age. While illness and medical disorders become increasing problems from 55 years onwards, (especially Diabetes and Cardiovascular Disorder), many older seafarers can meet the required state of medical fitness and physical activity for safe work at sea for extended periods of time. As of turning 55 years of age, seafarers will be examined by a Medical Inspector on a yearly basis. In a small number of cases where reduced cognitive function or memory is suspected, brief clinical screening with a clinical screening instrument such as the Montreal Cognitive Assessment (MoCA) is to be used. (See Section 9.15)

When assessing older seafarers, the primary consideration is that they should be in reasonable health and safe to work at sea:

- be fit mobile active and able to do their work tasks safely and efficiently;
- meet these medical standards including visual acuity/ colour vision;
- be able to perform physically demanding work;
- be medically able to work shift work; and
- be able to be part of a fire fighting team and assist in emergency situations and evacuations.

Annex 1 Job task analyses

Table 1 Master/Deck Officer/Pilot

Table 2 Engineering Officer/Electro-Technical Officer

Table 3 Integrated Ratings/Able Seafarer-Deck/Seafarer forming part of a navigation watch

Table 4 Able Seafarer Engine/Seafarer forming part of an engine room watch

Table 5 Cook/Steward/Catering Attendant

Table 1: Master/Deck Officer/Pilot

1. Vision	<ul style="list-style-type: none"> • read instructions • read instruction manuals • read charts • read weather maps • distinguish red/white/green navigation lights • distinguish coloured light alarms • observe aspect of other vessels • read radar, GPS and other monitors (digital, analogue and graphic) • read computer screens • identify navigation lights from beacons, buoys, lighthouse towers, other vessels • keep watch for obstacles to navigation • standing watch – night vision and depth perception
2. Hearing/speech	<ul style="list-style-type: none"> • give/take instructions • use 2-way radios and telephones • distinguish different auditory alarms
3. Consciousness	<ul style="list-style-type: none"> • alert to changes in machinery vibration e.g. engines • alert to movements of other vessels • alert to position of ship's ancillary craft • interpret complex information from digital, analogue and graphic computerised monitoring equipment e.g. radar, GPS, computerised charts, compass • respond to alarms • alert to changes in weather • high level decision-making in emergencies • responsible for safety of ship's crew and safety of vessel • alert to movements and position of crew
4. Physical	<ul style="list-style-type: none"> • climb narrow, steep stairs • climb 3 metre rope ladders at sea • climb mast* • climb steel rungs/ladders • lift hatch covers* • fine motor skills to plot courses on charts, use keyboards on computer, rotate knobs, pull levers, push buttons • assist with lifting, manual labour e.g. lifting cylinders, 25 litre drums etc* • cleaning/maintenance of the bridge (wheelhouse)* • place tags for safety checks* • clean own cabin, shower i.e. bending, reaching, scrubbing, and wiping (varies from ship to ship)* <p>Additional for supply vessels</p> <ul style="list-style-type: none"> • handle cargo on the back deck of a supply vessel* • handle wires, chains and ropes during anchor handling* • hook and unhook tows*
5. Other	<ul style="list-style-type: none"> • work shiftwork (4 or 12 hour watches) • occasional long hours of work (18+) • write reports (log) • plan ship repairs* • plan work schedules* • away at sea for up to 6 months at a time* • fit through escape hatches* • work at high temperature, humidity and/or in extreme cold & in storms/cyclones etc • wear PPE—boots, overalls, hard hat, hearing protection and occasionally respirators • order deck stores* • use computers to write reports, keep chart catalogues* • check radio equipment, liferafts* • inspect oil, other cargo, ballast and water tanks and other confined spaces* • work with heavy seas on deck • work in conditions involving heavy rolling and pitching of vessel • use fire fighting hoses, extinguishers and breathing apparatus

* These duties are not normally required of a pilot

Table 2: Engineering Officer/Electro- technical Officer

1. Vision	<ul style="list-style-type: none"> • read gauges, dials • read instruction manuals, drawings • near vision for callipers and other instruments • near vision for identifying and using nuts, bolts, screws, pins etc • ability to distinguish basic colours to recognise coloured alarms and coloured wires
2. Hearing/speech	<ul style="list-style-type: none"> • communicate by 2-way radio • hear alarms and pager • give/take instructions
3. Consciousness	<ul style="list-style-type: none"> • alert to alarms (visual and auditory) • respond to emergencies • alert to position of ship's ancillary craft • interpret complex information from monitors and gauges on instrument control panels in engine room
4. Physical	<ul style="list-style-type: none"> • lifting and carrying condenser coils, pipes, motors, pumps up to 35 kg – but can be carried by two persons • lifting and carrying 25 kg containers of chemicals • use lathes, circular saws, hand tools, grinders & pedestal drill • welding/oxy-cutting • fine manual dexterity in placing nuts, bolts, screws • turning valves, levers • pushing button controls • climbing steep stairways, steel rung ladders, rungs on masts and onto ship's crane • standing and walking most of the shift • working in awkward postures • working in confined spaces • working overhead • clean own cabin, shower i.e. bending, reaching, scrubbing & wiping (varies from ship to ship) <p>Additional for supply vessels</p> <ul style="list-style-type: none"> • handle cargo on the back deck of a supply vessel • handle wires, chains and ropes during anchor handling • hook and unhook tows
5. Other	<ul style="list-style-type: none"> • work shiftwork (4 hour watches) • write reports (log) • plan ship repairs • plan work schedules • away at sea for up to 6 months at a time • fit through escape hatches • work at high temperature, humidity and/or in extreme cold & in storms/cyclones etc • wear PPE–boots, overalls, hard hat, hearing protection and occasionally respirators • order engine room stores • exposure to heat and fumes • use computers to write reports, keep chart catalogues • safe handling of chemicals • check radio equipment, liferafts • inspect water tanks • work in conditions involving heavy rolling and pitching of vessel

Table 3: Integrated Rating/Able Seafarer-Deck/Seafarer forming part of a navigation watch

1. Vision	<ul style="list-style-type: none"> • read instructions, procedures • read gauges, dials • read labels on chemicals • distance vision when operating small craft, crane, hoist • see navigation lights of other vessels, beacons, lighthouses etc • distinguish red/green coloured lights • distinguish coloured light alarms • stand watch – night vision and depth perception • near vision for identifying shackles, markings on slings, bolts, nuts, screws etc
2. Hearing/speech	<ul style="list-style-type: none"> • give/take instructions • hear whistles for crane/hoist movements • use 2-way radio • listen to machinery e.g. crane, LARC • hear warning signals/alarms • use hands free headsets to communicate by radio in rough seas
3. Consciousness	<ul style="list-style-type: none"> • alert to movements of other persons, operating machinery, ship's small craft and helicopter • monitor equipment including radar, digital and analogue read outs on gauges, GPS, compass, • and generally assist officer on watch
4. Physical	<ul style="list-style-type: none"> • manual dexterity to tie knots, splice rope, repair/use canvas tarpaulins, place slings, use pliers, spanners & other hand tools • pulling knobs, levers, pushing buttons to operate crane, machinery, incinerator • reaching and working overhead • shovel ash from incinerator and lift bags of rubbish into incinerator • lift stores • lifting from deck to overhead to load ship's small craft • climbing ship's rope ladders (3m) in rough seas, and steel rung ladders on towers (up to 30m) whilst carrying ropes, light tool bag • lifting weights up to 50 kg (two person lift) • lifting cables, boxes, batteries, winches, hoists up to 40 kg • use powered tools, saws, drills, rattleguns, chisels, sledgehammers • mooring/unmooring vessels • use air/electric chain hoists – pulling on ropes, chain, and pressing buttons on handheld control box • carpentry/shipwright duties • standing for long periods (3 hours) • clean own cabin, shower i.e. bending, reaching, scrubbing, and wiping <p>Additional for supply vessels</p> <ul style="list-style-type: none"> • handle cargo on the back deck of vessel • handle wires, chains and ropes during anchor handling • hook and unhook tows
5. Other	<ul style="list-style-type: none"> • work at heights • work in high temperature, humidity and/or in extreme cold, and in storms, cyclones etc • long work hours (up to 10-12 hours per day) • away at sea for up to 6 months at a time • fit through escape hatches • shiftwork when on 4-hourly watch • ship's fire and safety rounds – inspect all areas regularly • plan work schedules • wear personal protective equipment e.g. safety boots, earplugs or earmuffs, hard hat, gloves, overalls, safety spectacles and occasionally respirators • exposure to paints, thinners, oils, antifoul, degreasers • use fire-fighting hoses, extinguishers • work in oil, other cargo, ballast and water tanks and other confined spaces • work in conditions involving heavy rolling and pitching of vessel

Table 4: Able Seafarer Engine/ Engine Room Rating/Seafarer forming part of an engine room watch

1. Vision	<ul style="list-style-type: none"> • read instructions, procedures • read gauges, dials • read labels on chemicals • distance vision when operating small craft, crane, hoist • distinguish coloured light alarms
2. Hearing/speech	<ul style="list-style-type: none"> • give/take instructions • hear whistles for crane/hoist movements • use 2-way radio • listen to machinery e.g. crane, LARC • hear warning signals/alarms • use hands free headsets to communicate by radio in rough seas
3. Consciousness	<ul style="list-style-type: none"> • alert to movements of other persons, operating machinery, ship's small craft and helicopter • monitor equipment including digital and analogue read outs on gauges.
4. Physical	<ul style="list-style-type: none"> • pulling knobs, levers, pushing buttons to operate crane, machinery, incinerator • reaching and working overhead • shovel ash from incinerator and lift bags of rubbish into incinerator • lift stores • lifting from deck to overhead to load ship's small craft • climbing ship's rope ladders (3m) in rough seas, and steel rung ladders on towers (up to 30 whilst carrying ropes, light tool bag • lifting weights up to 50 kg (two person lift) • lifting cables, boxes, batteries, winches, hoists up to 40 kg • use powered tools, saws, drills, rattleguns, chisels, sledgehammers • mooring/unmooring vessels • use air/electric chain hoists – pulling on ropes, chain, and pressing buttons on handheld control box • standing for long periods (3 hours) • clean own cabin, shower i.e. bending, reaching, scrubbing, and wiping <p>Additional for supply vessels</p> <ul style="list-style-type: none"> • handle cargo on the back deck of vessel
5. Other	<ul style="list-style-type: none"> • work at heights • work in high temperature, humidity and/or in extreme cold, and in storms, cyclones etc • long work hours (up to 10-12 hours per day • away at sea for up to 6 months at a time • fit through escape hatches • shiftwork when on 4-hourly watch • ship's fire and safety rounds – inspect all areas regularly • plan work schedules • wear personal protective equipment e.g. safety boots, earplugs or earmuffs, hard hat, glove overalls, safety spectacles and occasionally respirators • exposure to paints, thinners, oils, antifoul, degreasers • use fire-fighting hoses, extinguishers • work in confined spaces • work in conditions involving heavy rolling and pitching of vessel

Table 5: Cook/Steward/Catering attendant

1. Vision	<ul style="list-style-type: none"> • near vision for reading labels, menus, recipes, computer, instructions, orders for stores, invoices, telexes, faxes • near vision for cutting, slicing, cooking <p>Distinguish coloured lights/alarms on galley range</p>
2. Hearing/speech	<ul style="list-style-type: none"> • give/take instructions • use telephones to contact providores, clients • communicate with ship's crew • hear alarms
3. Consciousness	<ul style="list-style-type: none"> • alert to movements of persons in kitchen because of hot food in saucepans and trays • alert to position of deep fryers, cooking pots, pans especially in rough weather • alert to hazards on ship e.g. fire etc
4. Physical	<ul style="list-style-type: none"> • lifting, carrying, unpacking stores from gangway or forehead store space • unpack and place stores on shelves in fridges and freezers from floor height to shoulder height • unpack cartons each trip e.g. soft drinks, cans, foodstuffs, and cleaning gear • cleaning pots and utensils in sinks at waist height • wiping and scrubbing benches, deckheads, bulkheads, fridge mats, • cleaning kitchen and laundries, ovens and deep freezers – mopping, scrubbing • loading/emptying dishwasher – bending required • polish passageways • standing for long periods (3 hours) • fine manual dexterity to use kitchen utensils, knives and to turn knobs, flick switches on ovens, hot plates and appliances • clean own cabin, shower i.e. bending, reaching, scrubbing, and wiping • cleaning grease traps and tanks • mopping/sweeping and/or vacuuming • climb narrow stairways
5. Other	<ul style="list-style-type: none"> • order all food provisions • plan menus • cooking all meals for all persons on board • work split shifts with early starts plus additional hours for administration and other paperwork • away at sea for up to 6 months at a time although calling in at various ports during the voyage • fit through escape hatches • use a computer • wear safety footwear • work in conditions involving heavy rolling and pitching of vessel • take an active role in vessel safety and emergency drills

Annex 2 Guidance in screening for colour vision

1. Need for good colour vision

Deck officers need to be able to distinguish red, green and white navigation lights in order to be able to make correct decisions regarding the aspect of an approaching vessel, and regarding what action needs to be taken, if any, to avoid a collision. Confusion between such lights would lead to incorrect decisions being taken, with the potential for collision and resultant deaths, injuries and loss.

Ratings on lookout duty similarly need to be able to distinguish red, green and white navigation lights in order to provide correct advice to the officer of the watch.

Engineering officers and ratings on engine room duty need to be able to distinguish both warning lights (normally coloured red) from correct status lights (normally coloured white or green) and also need to be able to distinguish the colours of electrical wires when making connections.

Note: See also Part B – Medical Standards, Section 3 Eyes / Vision

2. Tests

The Ishihara pseudoisochromatic plate test should be used to screen seafarers in the deck and engine departments for colour vision impairment. If the individual passes the Ishihara test they are considered red-green colour safe and no further testing is required. However if the tests indicate colour confusion or impaired colour vision, further testing should be completed.

In the case of persons in the deck department who are required to keep watches, the further test should be the Holmes-Wright Type B lantern standard. This is a lantern test designed for maritime conditions and the test is conducted by some ophthalmologists, optometrists and the Schools of Optometry in various Universities around Australia.

In the case of persons in the engine department whose duties may include making electrical connections. Further testing should evaluate safe recognition of red-green surface colours. Passing a Farnsworth D15 test would generally identify those individuals who are red-green colour safe. Those who fail the Farnsworth D15 test could be referred to colour vision specialists for further testing.

Note: For information on where to refer seafarers with colour vision deficiencies, Medical Inspectors should contact the Seafarer Administration Team at Sonic Health Plus.

3. Ishihara Test

The Ishihara pseudoisochromatic test (using either the full set of 38 plates or the abridged version of 24 plates) should be used.

A satisfactory response using the 24 page edition is two or less errors on plates 1-17. If the tests indicate impaired colour vision, further testing should be performed or requested.

4. Holmes Wright Type B Lantern Test

4.1 Standard

- 4.1.1 The lantern test is a practical test of a person's ability, in conditions simulated to represent a watchkeeping situation, to recognise and discriminate between navigation lights used at sea.
- 4.1.2 A lantern test is conducted by means of a Holmes/ Wright type B lantern standard, which projects red, green and white lights viewed indirectly through a polished mirror at a virtual distance of 6 metres from the eyes. The large aperture of the lantern projects one coloured light at a time and the small apertures project 2 coloured lights side by side at a time. Each full circuit of the lantern contains 9 settings of single large apertures or 9 settings of small apertures. The small apertures of the lantern show any combination of 2 of the 3 colours.
- 4.1.3 A person who uses an aid to vision for a letter test is required to use the same aid to vision in the lantern test.
- 4.1.4 A person who does not use an aid to vision for a letter test is not permitted to use an aid to vision in the lantern test.
- 4.1.5 A person undergoing the lantern test must not wear a tinted aid to vision for the purpose of passing the test.
- 4.1.6 The lantern test must be conducted in a room from which daylight is excluded.
- 4.1.7 A person who requires to adapt to conditions of darkness is to be allowed up to 10 minutes complete or partial darkness in preparation for the lantern test.
- 4.1.8 A person is considered to have passed the lantern test if he or she correctly names the colours of one full circuit of large apertures, 4 full circuits of small apertures shown in sequence, and 9 sets of small apertures shown at random.
- 4.1.9 The procedures specified in 4.10 to 4.16 should be followed if a person undertaking the lantern test fails to achieve a pass in accordance with 4.8.
- 4.1.10 At the first mistake in naming a colour correctly, the examiner must inform the person being tested of the mistake and continue the test, adding a further circuit.
- 4.1.11 If no further mistake is made in the test and the further circuit, the person being tested will be considered to have passed.
- 4.1.12 If a second mistake is made, the procedure under 4.10 and 4.11 of this Appendix is to be repeated.
- 4.1.13 If a third mistake is made, the test is to be repeated from the start after the person being tested has been given the opportunity to rest his or her eyes or regain composure.
- 4.1.14 In repeating the test under 4.13, the examiner is to record the result but not inform the person being tested of mistakes being made.
- 4.1.15 A person who in the repeated test under 4.13, correctly names all colours in accordance with 4.8 will be considered to have passed.
- 4.1.16 A mistake of red for green or green for red in the repeated test under 4.13 means failure of the Holmes Wright Lantern test.
- 4.1.17 A person who has failed the lantern test may request a further test.

5. Farnsworth D15 test

The D15 set (fully saturated) is a modification of the Farnsworth-Munsell 100 Hue Test. The D15 test is intended for classification of colour vision defects. Each D15 set contains a reference disc and fifteen numbered discs, which make up an incomplete circle. Following an attempt to sequentially arrange the discs by the patient, evaluation determines colour perception defects in deutan, protan or tritan axis discrimination.

The Farnsworth D15 test is called 'dichotomous' because it was designed to separate subjects into one of two groups: 1) Strongly/Medium colour deficient or 2) Mildly colour deficient or colour normal. This is accomplished by the arrangement of vivid (fully saturated) coloured discs.

It is important to insure that the colour section is not touched to avoid damage and alteration of colour.

The test is administered on a black background to minimise external factors affecting the colour perception. The illumination should be approximately 6700°Kelvin or daylight or daylight fluorescent lighting.

Testing for congenital colour defects is usually accomplished binocularly. Testing for acquired defects (toxicity, trauma, retinal disease, etc.) is usually administered on each eye separately.

The examiner allows 2 minutes for the test. The Farnsworth D15 test is not sensitive to mild to moderate visual acuity loss. The tests are designed to be conducted at a working distance of 50cm.

Testing Procedure. Remove the discs from the box and slide all of the colour discs onto a black surface. The examiner then selects the reference. The test subject is then asked to select the colour disc which most closely matches the reference cap and place it next to the reference cap. The patient then continues to select the next closest colour disc and places each in sequence.

Two minutes is allowed to arrange the discs and the test subject may be permitted to alter the sequence prior to completion. The examiner should turn the discs maintaining the test sequence order and score the test.

Scoring. For detailed notes on scoring please refer to the guidance notes accompanying the D15 test.

Scoring is accomplished by reading the numbers on the reverse side and recording the sequence selected by the patient on a copy of the score sheet. A patient with a colour vision deficiency will arrange the colour discs in a different order than a person with normal colour vision.

The test has a standard form or score sheet for scoring. A line is drawn from the starting point of the reference disc through the sequence determined by the patient. If the lines remain along the outside of the circle then the patient is considered to be 'normal' or very mildly colour deficient.

If the sequence lines cross the centre repeatedly, these are called major crossings and the patient has a medium or strong defect. The type of defect is determined by comparing these crossover lines to see if they are parallel to the protan, deutan or tritan colour confusion axes.

Confusions occurring regularly in a certain direction across the score sheet reveal the type of colour defect.

Confusion among colour discs that are close together are called minor crossings and not considered significant.

Pass and fail criteria. A screening pass with the D15 test is no errors, minor transpositions or one major or diametrical crossing. The subject in this case would have normal colour vision or a red-green safe mild colour vision defect or confusion.

A fail screening is two or more major or diametrical crossing which represents moderate to severe colour vision defects and this would trigger a retest.

If retest is required, review the instructions with the patient again to be sure that the test procedure is fully understood. Record the retest on a second score sheet.

Those who fail Ishihara testing and D15 testing can be referred to other specialists in colour vision testing for comprehensive retesting and evaluation of red green colour safety at work.

