



Australian Government

Australian Maritime Safety Authority

Standards for the Medical Examination of Seafarers and Coastal Pilots

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To the Medical Inspector - How to use these standards

When an applicant presents for a medical:

- Refer to the relevant job task analysis in Appendix 1 of these standards.
- Examine the applicant and note any abnormalities on either history or physical examination.
- If any abnormalities are detected, refer to the appropriate section in the standard.
- Complete the Medical Examination Report, Certificate of Medical Fitness and make appropriate follow-up and referral arrangements for applicants found to be temporarily or permanently unfit for duties.

Accurate records in AMSA's qualifications database are essential. Medical Inspectors should confirm the correct spelling of the applicant's family name and given names. It is also very helpful if the applicant can provide their AMSA Seafarer ID number, which is printed on the reverse side of the certificate of competency booklet cover or on the front of their credit card sized certificate.

Part A Seafaring and Medical Fitness

1. Introduction

Marine Order 76 (Health – medical fitness) 2017 (**MO 76**) is administered by the Australian Maritime Safety Authority (AMSA). MO 76 sets out the rules for issuing Certificates of Medical Fitness to seafarers and coastal pilots. MO 76 gives effect to international requirements under regulation I/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).

This document outlines the minimum statutory standards that Medical Inspectors must use when assessing whether a person is fit to work at sea. The standards are based on the job task analyses in Appendix 1.

The Medical Inspector makes the final decision on whether an applicant meets the minimum statutory fitness requirements for a particular role at sea. These standards highlight medical conditions that have the potential to present a high level of risk in some circumstances.

1.1 Why is fitness important?

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. Medical assessment of fitness is one aspect of meeting this duty of care.

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 reduce the risk of avoidable health problems offshore that could endanger them, their colleagues and emergency personnel.

Medical conditions can affect a person's ability to work at sea in the following areas:

- the condition may limit 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);
- the job itself may make the conditions worse (e.g. an asthmatic exposed to allergens on a grain vessel);
- the condition may make it unsafe for the person to carry out their duties (e.g. liability to sudden loss of consciousness whilst transferring from a smaller vessel to a larger vessel by climbing a rope ladder);
- the condition may create risks for both for the individual and other crew (e.g. a crane operator liable to sudden loss of consciousness; catering crew with infectious hepatitis or gastro- enteritis);
- the condition may pose risks for other ships and shipping operations (e.g. a master or deck officer who is at risk of sudden loss of consciousness due to a cardiac arrhythmia); and
- if the condition worsens, it may require emergency evacuation for medical treatment (e.g. gastric ulcer haemorrhage).

1.2 The work environment of seafarers

Medical Inspectors must consider the realities of seafaring life, when assessing fitness for duty at sea.

As vessels often operate far offshore or in remote areas it is difficult to replace seafarers who become injured or ill. Many vessels only maintain the minimum number of persons on board necessary to operate the vessel; thus, even one seafarer incapacitated places an additional burden on other crew members.

Masters and deck & engineer officers receive basic first aid and other medical training, and vessels are usually equipped with basic medical supplies. However, evacuation of sick or injured seafarers to shore-based medical facilities may pose difficulties (such as long delays) to the crew or an emergency response team due to the distance involved. In some geographical areas, the standard of shore-based medical facilities may be well below the standard of the seafarer's home country.

Certain medical conditions may make it unsafe to become seafarers or to return to seagoing employment.

Seafarers live in close quarters for long periods. Contagious diseases are a serious threat, endangering the health of other seafarers, passengers, and the vessel. Seafarers involved with the preparation of food must not suffer from conditions which could be transmitted to others through their work.

Seafarers must be medically fit to perform their normal duties and respond to emergency situations (e.g. fighting fires, lowering lifeboats, assisting passengers, etc.).

Seafarers must be able to adjust to the often violent motions of the ship, able to climb ladders, access and work in small spaces, lift heavy loads and be able to withstand harsh weather conditions on deck or excessive heat in machinery spaces. Those who travel by air to ports or worksites must not have conditions made worse by air travel.

Seafarers must be able to live and work closely with the same people for weeks or months, sometimes under stressful conditions. They must be able to handle isolation from family and friends and cultural environments.

Vessel operations and onboard duties vary significantly. For a full understanding of physical demands of work onboard, the Medical Inspector may need to consult the employer.

2. Procedures

2.1 Frequency of health assessments

Seafarers and coastal pilots must be assessed for medical fitness for duties at sea at the following intervals:

- less than 18 years of age - annually
- 18 - 55 years of age - every two years
- over 55 years of age - annually with resting ECG (stress ECG, if in safety critical job and clinically indicated);
- whenever there is a change in the medical condition of the employee; and
- after prolonged absence of 3 months or more due to injury or illness.

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

What information goes to the applicant

The applicant must receive their own copy of the Certificate of Medical Fitness and upon request, receive a copy of the Medical Examination Report.

The Medical Inspector must keep copies of all the forms associated with the medical examination, including results of investigations in a confidential file, for 7 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

An applicant is either fit for the intended duties at sea, fit for restricted duties or unfit.

If the seafarer is fit for duties with limitations or restrictions, the Medical Inspector must clearly outline the limitations on the Certificate of Medical Fitness (i.e. not fit for lookout duties during the hours of darkness, must not operate lifting appliance, etc.).

Those declared unfit may be temporarily or permanently unfit. If a person is found temporarily unfit, the Medical Inspector must set a minimum time before the assessment is reviewed again.

3. Forms

The form of the Certificate of Medical Fitness (AMSA303). and the Medical Examination Report (AMSA232), are available from the AMSA web site at www.amsa.gov.au

Part B Medical Standards

1. Overview

This section outlines standards for medical conditions which may affect individuals in the safe performance of their duties at sea.

The standards do not cover every clinical situation and the Medical Inspector must use their judgement in relation to the key objective - maintaining safety at sea.

Medical Inspectors must consider what medical conditions could reduce the ability to perform critical tasks when determining if the applicant is medically fit for duty at sea.

Medical conditions that may impair fitness and safety must be carefully assessed and sufficient information recorded on the Medical Examination Report to form an adequate evidence base for the final decision on fitness.

The proximity of appropriate shore-based care must be considered when determining fitness and safety for service at sea.

2. Obesity

2.1 Body morphology

Obesity can hamper evacuation procedures. Persons with a Body Mass Index (BMI) of more than: 30 kg/m² may need to demonstrate the ability to climb ladders, climb over storm door sills, fit through hatches and not exceed safety limits for rescue equipment. Larger individuals face increased physical demands and hazards in a marine environment.

Where there is doubt concerning physical abilities, a functional assessment should be performed by an Occupational Physician or an Occupational Therapist either in a suitably equipped office or onboard a vessel.

The testing must 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 of standard dimensions may also be assessed.

A BMI of more than 40 kg/m² presents increased risk of ill health and injury onboard a vessel. The primary concern for overweight seafarers is safe mobility around a vessel, the ability to move quickly in an emergency and navigate standard hatches without restriction.

Applicants in this category may need to undertake weight reduction and be reassessed.

Note: Obstructive sleep apnoea, diabetes and hypertension are more common in those with morbid obesity.

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 vessel.

3. Eyes/vision

3.1 Visual acuity

Long distance vision is required for:

1. lookout duties;
2. control of vessels and vessels' small craft, and

3. operation of cranes and lifting equipment.

Near vision is required to read charts, weather maps, electronic displays, instruments and instructions.

Night vision and depth perception are required for lookout duties and control of the vessel. Depth perception is also required for operating cranes or lifting equipment at close range.

3.2 Colour vision

Good colour vision is essential for bridge watchkeeping and lookout duties to distinguish red and green port and starboard channel markers, navigation beacons and vessels' 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.

Seafarers who do not have normal colour vision cannot perform lookout duties, meaning they should be deemed unfit for lookout duties. The only restriction that can be used is 'UNFIT LOOKOUT DUTIES'

Impaired colour vision presents a risk to engineering and electro-technical officers and ratings who need to distinguish the colour of systems components within the engine room, such as electrical wiring, alarms, and pipe identification.

The primary screen is the **Ishihara Pseudoisochromatic Plate** testing. If this is passed the standards are met and an applicant is considered red-green colour vision safe for deck and/or engine room duties.

If a deck officer, integrated rating or deck 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 an engineer officer, integrated rating, or engine room rating passes either an **Ishihara screen** or a **Farnsworth D15** colour vision matching test they are considered red-green colour safe for all engine room tasks (visual acuity requirements must also be met).

Notwithstanding the above, existing engineer officers, integrated ratings and engine room ratings, who fail the above colour vision tests, may provide a statutory declaration confirming that their impaired colour vision has not affected their engine room work in the 12 months prior to the medical examination. Medical Inspectors should take this into account when considering whether the applicant is red-green colour safe for engine room tasks and attach the declaration to the Medical Examination Report.

When testing colour vision, coloured lenses must 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 and 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.

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 Appendix 2 of these Standards.

Any eye disease, disorder or defect which affects colour vision must be corrected.

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.

An applicant with a history of glaucoma or uveitis, must undergo ophthalmological assessment.

The applicant must meet the vision standards listed in Table 1(a) and/or (Table 1 (b)).

Table 1(a): Visual standards - Deck department

Role or duties	Better eye (distance) not less than	Other eye (distance) (a) not less than	Both eyes (distance) not less than	Near vision	Colour vision	Visual fields
Seafarers required to undertake lookout and/or 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	Normal visual fields
Seafarers required to operate lifting plant e.g. vessels' cranes, hoists: (aided vision if necessary)	6/9	6/12	6/9	N12 with or without visual aids	Distinguish red (b)	Normal visual fields
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

Table 1(b): Visual standards - Other departments

Role or duties	Better eye (distance) not less than	Other eye (distance) (a) not less than	Both eyes (distance) not less than	Near vision	Colour vision	Visual fields
Engine room (includes electrician): (aided vision if necessary)	6/12	6/60	6/12	N12 to read instruments, gauges on control panels	See Appendix 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) Vision below these standards in the worse eye (or monocular vision) is not acceptable in new seafarers.
 - b) It is sufficient if the applicant can distinguish red from other colours. See Appendix 2.

4. Hearing, ear, nose and throat conditions

4.1 Hearing standard

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. A functional hearing loss sufficient to interfere with communication or to impede safety (e.g. hearing audible warning devices) presents a high risk.

Hearing loss for new entrants should be checked by means of an audiogram. If the new entrant uses a hearing aid, the person must be referred to an audiology specialist unless evidence is produced of recent testing and hearing using the aid is apparently satisfactory.

For existing seafarers, an audiogram is only required if hearing appears unsatisfactory in one-to-one conversation. Seafarers wearing hearing aids who have unsatisfactory hearing in normal conversation must have their devices checked by the supplier and undergo a practical test to assess functional hearing.

The speech must be reasonably clear, free of stutter and hesitation, to sufficiently use radios and communicate on deck. Those using cranes must be able to hear whistle signals where these are used.

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

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

If hearing loss is 40dB or more at the frequencies specified in Table 2 the applicant must pass a conversation test.

Note: The applicant must demonstrate the ability to use a radio and other means of communication.

4.2 The conduct of the conversation test

The following is a recommended procedure for conduct of a conversation test.

- 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.
- The examiner should face the subject and address him/her from 3 metres away and speak normally.
- The subject should be seated facing away from the examiner to prevent lip reading and the use of non-verbal clues.
- A normal conversational vocal volume should be used.
- 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.
- Ten combinations must be used, each preceded by the carrier phrase "PLEASE SAY".
- The subject should repeat what was thought to be heard. If uncertain, guessing is encouraged.

- Six or more combinations should be repeated without error to be considered satisfactory.

Applicants who do not pass this test must be referred for further assessment of functional hearing and speech discrimination by an audiologist.

4.3 Other ear, nose and throat conditions

Acute infections require treatment. Chronic middle ear disease presents a high risk; recurrent or chronic sinus infection presents less of a risk if the Medical Inspector is satisfied the condition can be managed with appropriate medication at sea.

Vestibular malfunction can occur suddenly and severely, making safe operations of vessels and cranes impossible. It may be accompanied by nystagmus compounding the disability. Meniere's disease therefore presents a high risk.

Hay fever (allergic rhinitis) that responds to therapy (without side effects) presents a lower level of risk.

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 impair exercise tolerance when climbing or working in confined spaces. Some cardiovascular conditions, if they become acute, can require immediate emergency medical care or evacuation, neither of which may be available, particularly in remote locations or in bad weather.

Applicants must be assessed to ensure they are free of any cardiovascular condition which puts themselves or others at risk. Applicants 55 years and over, or with a history of cardiovascular disease, require a resting ECG. A stress ECG may be performed if clinically indicated.

5.1 Ischaemic heart disease

Current angina presents a high risk. Any occurrence of confirmed myocardial infarction, coronary artery bypass grafting, coronary angioplasty or stent within the previous 3 months presents a high or increased risk.

Lower risk applies if the applicant has been symptom free of coronary artery disease for more than 3 months, risk factors are controlled and no angina medication is necessary. Review must be by a cardiologist using test results, 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 fit to return to sea within 3 weeks, subject to cardiologist opinion.

Any doubt about medical fitness to return to work at sea must be referred to a cardiologist.

Applicants may be declared fit if:

- 3 months or more has elapsed since the last symptom,
- 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.

Annual or more frequent cardiological review is highly recommended.

5.2 Dysrhythmia/pacemaker

A history of recurrent or persistent dysrhythmia causing syncope or incapacitating symptoms presents a high risk.

Applicants who have undergone surgery (e.g. for Wolf- Parkinson White syndrome), or successful treatment with medication for at least 3 months, may be declared fit, subject to annual cardiological review.

Applicants with a pacemaker may be declared fit if the Medical Inspector has taken into account the underlying disease and is satisfied that the pacemaker function has been appropriately tested. Ongoing fitness may require 6-monthly testing at a pacemaker clinic and cardiological review.

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

5.3 Valvular heart disease

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.

Taking anticoagulants is acceptable, if the dosage has been stable, and monitoring of the blood is compatible with swings.

An applicant 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 leave periods.

Equivocal cases should be referred to an independent medical panel.

5.4 Cardiomyopathy

Established cardiomyopathy presents a high risk.

A heart or heart/lung transplant presents a high risk.

5.5 Aneurysms

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

5.6 Hypertension

Blood pressure (taken whilst seated) of 160/100 or greater (treated or untreated) presents a high risk.

End organ damage (cardiac, cerebral, retinal or renal) which would impair safe operation of vessels, cranes or small craft presents a high risk.

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 vessel, crane, or small craft presents a high risk.

A Certificate of Medical Fitness for duty to sea may be issued:

- Initially if the applicant is treated with anti-hypertensive therapy and effective control of hypertension is achieved (not greater than 150/95) without significant side effects over a four-week period. An annual review is required;

- If blood pressure control (not greater than 150/95) has been achieved and is stable for 2 years, well documented and 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

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

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.

Peripheral vascular disease with intermittent claudication presents a high risk.

5.9 Pulmonary circulation

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

Respiratory disorders should be assessed for the risk of an acute exacerbation requiring emergency medical treatment (e.g. asthma, pneumothorax) or symptomatic airway disease that reduces capacity for physical work or ability to wear a respirator.

6.1 Pneumothorax

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

Asthma, chronic obstructive or restrictive airways disease and emphysema affect the ability to use self-contained breathing apparatus, or wear respirators. Persons with asthma or allergy may find working on vessels carrying grain affects their respiratory function.

Asthma requiring oral corticosteroids and/or frequent medication presents a high risk.

A history of childhood asthma subsequently resolved in adolescence is acceptable.

Well-controlled asthma managed with inhaled corticosteroids and intermittent need of bronchodilators may be acceptable. A report from the applicants' 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

Severe respiratory disorders reduce physical effort tolerance. This can impair safe operation of vessels, cranes and confined space work through inadequate oxygen and/ or increased carbon dioxide to the brain and heart. This can lead to poor judgement, agitation or drowsiness, reduced concentration and cardiac effects such as right heart failure or arrhythmia.

For work requiring use of a respirator, (such as entry into confined spaces or work on vessels carrying dusty cargoes) an FEV below 65 per cent, FVC below 70 per cent and/or FEV /FVC less than 70 per cent are grounds for concern. A practical respirator assessment may be requested.

Reduced lung function, in individuals who get dyspnoea on exertion, may find climbing ladders on vessels 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 moving around a vessel. If in doubt a practical test should be requested.

6.4 Tuberculosis

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

6.5 Chest X-rays

A chest X-ray is required for new entrants (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

Seafarers must be dentally fit, as, other than temporary pain relief, there is no dental treatment aboard a vessel. Dental abscesses or severe gingivitis presents a high risk. Applicants with impacted wisdom teeth may need dental review.

Medical Inspectors must 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 while dental treatment is pending, a seafarer may be given a temporary certificate for up to 4 months to allow time for dental work to be carried out.

7.2 Peptic ulcer

Acute peptic ulceration presents a high risk. However, treated peptic ulceration is acceptable, provided the Medical Inspector is satisfied 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

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

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

7.5 Hernia

An inguinal hernia presents a high risk with physical effort and manual handling unless surgically corrected. A small inguinal hernia, with no risk of strangulation and there is a

surgical opinion to state that there is no clinical indication for surgery may be determined as fit for lifting tasks.

A rectus divarication or large umbilical hernia must be surgically corrected before applicants can be assessed as fit for lifting tasks.

A diaphragmatic hernia without disabling reflux oesophagitis or other symptoms is acceptable.

7.6 Colostomies

A person with an uncomplicated stoma is acceptable provided that the underlying cause is compatible with work at sea and there are adequate facilities for changing colostomy bags on board the vessel.

7.7 Enteric diseases

Catering crew must be free of infectious enteric diseases, including hepatitis A.

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 must be carefully assessed to exclude any condition which may worsen and require urgent medical attention, e.g. renal calculi.

A history of renal calculi requires advice on adequate 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

Normal pregnancy carries increased health risks and may impact on the ability to perform work at sea, especially where the person is serving at sea for extended periods of time and in an offshore environment.

Pregnancy, in and of itself, does not prevent a person from working on a ship at sea, however it may be necessary for the seafarer and medical inspector of seafarers to consider special conditions, arrangements, or restrictions for pregnant seafarers who intend to continue to work at sea whilst pregnant. Whilst the normal risks of pregnancy can be managed routinely on shore, the nature of working at sea means that antenatal, medical and obstetric care, is simply not available in the same way as it is ashore.

Work at sea may also involve physical effort and endurance, manual handling, standing for extended periods of time and shift work. Many of these factors have been associated with an increased risk of spontaneous pregnancy loss or complications during pregnancy.

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, which may be exacerbated by sea-state conditions; and
- reduced tolerance of physical effort and manual handling.

These factors can adversely impact agility, safe movement, manual labour, and in some cases the tolerance of physical effort, especially through the second and third trimesters of pregnancy.

Furthermore, 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 full-term birth at sea carries increased risk of avoidable ill health or death for mother and child.

When deciding whether a seafarer is fit for sea, and what restrictions may be necessary, the Medical Inspectors of Seafarers should discuss and consider the following with the Seafarer:

- The extremely limited availability of antenatal and obstetric care at sea, and that a miscarriage (pregnancy loss) would be life threatening through risks of haemorrhage and infection.
- The nature of duties, responsibilities, area, and type of operations; and whether pregnancy restricts these duties.
- Whether the seafarer has a history of complications during pregnancy.
- The increased risk of complications past 28 weeks gestation, and that permitting the seafarer to serve at sea may be extremely hazardous to their health.
- Where the vessel(s) that the seafarer works on operate, noting that near coastal, short duration voyages means that the seafarer is in closer proximity to higher level medical care if needed, in comparison to a vessel on an ocean voyage.

Whilst pregnancy has increased risks throughout the entire period of the pregnancy, this is not sufficient justification for exclusion from work at sea in the first two trimesters. Where necessary, the MIS may seek a report from the treating obstetrician to assist in forming their decision on the seafarer's fitness for working at sea, and whether or not restrictions, such as near coastal voyages only, may be necessary.

9. Neurological System

Sudden loss of consciousness or loss of control of limbs or balance impairs the ability to control a vessel, small craft or a crane, to work at heights, or alone, and to keep watch.

9.1 Epilepsy

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 when working at sea.

For applicants 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 75 per cent of those with two or three unprovoked seizures have further seizures within 4 years.

A history of convulsions after 5 years of age, with a seizure-free period of at least two years, and not requiring medication, must be carefully assessed.

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

Acute incapacitating attacks of migraine which may be accompanied by neurological signs such as hemiparesis and visual defects presents a high risk.

An established history of migraine with management in place that does not interfere with capacity to work safely, is acceptable.

9.3 Stroke

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)

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.

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.

In such cases as outlined above, a review by a cardiologist/neurologist will be required.

9.5 Neuromuscular disorders including multiple sclerosis and parkinsonism

Parkinsonism, multiple sclerosis, or other neuromuscular disorders would preclude being in control of a vessel, operating cranes or other equipment and, where the disability is any more than minor muscular weakness, can affect climbing ability on rope ladders and steel rung ladders. Because of the progressive nature of most forms of neuromuscular disorder, these conditions generally present a high risk.

Drug induced Parkinsonism may disappear on cessation of the treatment. Should this occur, and the underlying case for which the drugs were administered would not be a cause for exclusion, then the applicant may be considered fit for duty at sea.

9.6 Memory and cognitive function

Seafarers must be able to complete 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 tasks efficiently and safely.

Problems with memory and cognitive function might occur with in some disorders, including prolonged high alcohol intake.

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. Applicants who failed such an assessment would need further medical investigation, specialist review and re-examination.

10. Psychiatric conditions

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

Affective disorders such as anxiety and depression can affect judgement, attention and motor activity and the Medical Inspector should consider this in relation to jobs with responsibility for the safe operation of vessels, cranes and equipment, including emergency procedures. The Medical Inspector should also consider 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 vessel 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. The shipboard environment presents unique obstructions to medication, namely seasickness and lack of supervision.

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 must 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 vessels, cranes, and powered tools.

11.1 Prescribed and over-the-counter drugs

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 or if access to medication is not available?

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

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 is not a barrier to operating plant and equipment. The Medical Inspector must be satisfied that the

person does not suffer sedative side effects and is aware of the potential effects of interaction with alcohol or other medications.

The 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, is undertaken. Each case will need to be assessed individually and discussed with the person's treating practitioner. More frequent reassessment will be required.

Persons using antihistamines should use those with the least sedative side-effects e.g. Astemizole (Hismanal).

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

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

Prescribed medication must be listed on the Medical Examination Report but is not required to be stated on the Certificate of Medical Fitness. The applicant must be warned that he or she must have adequate medication to last a voyage. The applicant must be advised of their obligation to inform the Master of the vessel of the prescribed medication.

Table 3: Classes of drugs with potential to affect an individual's skills to operate vessels, small craft, 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, beclomethasone, Dipropionate, sodium cromoglycate, 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

Illegal drugs such as opiates, cannabis and amphetamines may reduce a person's ability to safely operate vessels, cranes and machinery.

Any use of illegal drugs presents a high risk.

Note: 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).

11.3 Alcohol

Alcohol is implicated as a significant factor in work-related accidents.

Chronic high alcohol intake (60g or 6 standard drinks 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.

An applicant with a history and clinical evidence of chronic alcohol abuse and there is evidence of end organ damage such as organic brain damage or hepatomegaly, presents a high risk.

An applicant 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 applicant is fit to return to duties at sea.

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.

Vessels 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.

Most lifting tasks are 25kg or below and much use is made of lifting equipment (cranes and hoists, forklifts) both on vessels 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; and
- 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 applicant 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 must carefully assess an applicant with a lower limb prosthesis (e.g. a below- knee amputation). An office based or field agility test may be required to prove that rope ladders, steel rung ladders and stairs can be climbed, or alternatively evidence of satisfactory work performance at sea.

Applicants with a significant loss of motion or loss of muscle power may also require an agility test.

Where there is any doubt about mobility or other musculoskeletal issues, the Medical Inspector should arrange for a Functional Assessment. Medical Inspectors should be guided by the findings in their final determination of fitness for sea service.

13. Diabetes and other endocrine disorders

13.1 Diabetes mellitus

The Medical Inspector must bear in mind the risk to safety if the applicant had a hypoglycaemic attack or developed a ketacidotic coma.

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. This is not normally available onboard vessels.

The following conditions present a high risk:

- insulin dependent diabetes mellitus (IDDM);
- poorly controlled non-insulin dependent diabetes with unsatisfactory glucometer readings, high levels of glycosylated haemoglobin and/or recurrent glycosuria.

Applicants may be accepted where they:

- demonstrate a responsible attitude to self-management of a diabetic condition and
- have 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

If the applicants' diabetes is currently uncontrolled e.g. due to change in therapy, it may be necessary to consider them as temporarily unfit and subject to re-examination in three months.

13.2 Thyroid disease

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

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 applicants' adrenal function is sufficient.

14. Skin disorders

14.1 Infections

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

14.2 Dermatoses

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.

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, and haemarthrosis.

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.

Leukemia 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, sewage systems or ship's water supply systems, must be actively and reliably protected against Hepatitis A virus infection. A full course of immunisation is strongly recommended before commencing work in these areas. Applicants who have previously had Hepatitis A have lifelong immunity against re-infection and do not require active immunisation or booster doses of Hepatitis A vaccine. Evidence of immunity must be sought from the applicant and documented.

Blood borne infections, (e.g. Hepatitis B and C or HIV) are not a barrier to fitness for duty as a seafarer. However, may present an infection risk via exposure to infected blood. Seafarers identified as presenting such risk should be advised to ensure appropriate arrangements are in place so adequate precautions can be taken in the event of relevant injuries.

Medical Inspectors must assess whether blood borne infections require ongoing medication or have long term consequences which may compromise fitness and safety.

17. Neoplasms

Neoplasms of any type have the potential to disqualify an applicant 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. Applicants must be carefully reassessed after a diagnosis of cancer is confirmed and treatment instituted. The natural history and prognosis of the neoplasm must be taken into account. The progress and likelihood of disease complications or its treatment must be carefully evaluated.

18. Assessment of older seafarers

It is common for seafarers to work 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 meet the requirements of medical fitness and physical activity for safe work at sea for extended periods of time.

From age of 55, seafarers must undergo an annual examination by a Medical Inspector on a yearly basis. 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 perform tasks safely and efficiently;
- meet these medical standards, including visual acuity/ colour vision;
- be capable of physically demanding work;
- be medically able to undertake shift work; and
- be able to participate in a fire fighting team and assist in emergency situations and evacuations.

Where there is any doubt about mobility or other physical capability issues, the Medical Inspector should arrange for a Functional Assessment.

Medical Inspectors should be guided by the findings in their final determination of fitness for sea service.

Appendix A – 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

Requirement	Job task
1. Vision	• 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	• give/take instructions • use 2-way radios and telephones • distinguish different auditory alarms
3. Consciousness	• alert to changes in machinery vibration e.g. engines • alert to movements of other vessels • alert to position of vessel'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 vessel's crew and safety of vessel • alert to movements and position of crew
4. Physical	• 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 vessel to vessel)* • Additional for supply vessels • handle cargo on the back deck of a supply vessel* • handle wires, chains and ropes during anchor handling* • hook and unhook tows*
5. Other	• work shift work (4 or 12 hour watches) • occasional long hours of work (18+) • write reports (log) • plan vessel 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, life rafts* • 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

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| | <ul style="list-style-type: none">• use fire-fighting hoses, extinguishers and breathing apparatus |
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* These duties are not normally required of a pilot



Table 2: Engineering Officer/Electro-Technical Officer

Requirement	Job task
1. Vision	• 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	• communicate by 2-way radio • hear alarms and pager • give/take instructions
3. Consciousness	• alert to alarms (visual and auditory) • respond to emergencies • alert to position of vessel's ancillary craft • interpret complex information from monitors and gauges on instrument control panels in engine room
4. Physical	• 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 vessel'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 vessel to vessel) Additional for supply vessels • handle cargo on the back deck of a supply vessel • handle wires, chains and ropes during anchor handling • hook and unhook tows
5. Other	• work shift work (4 hour watches) • write reports (log) • plan vessel 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, life rafts • 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

Requirement	Job task
1. Vision	• 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	• 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	• alert to movements of other persons, operating machinery, vessel'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	• 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 vessel's small craft • climbing vessel'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, rattle-guns, chisels, sledgehammers • mooring/unmooring vessels • use air/electric chain hoists – pulling on ropes, chain, and pressing buttons on handheld control box • carpentry/vessel wright duties • standing for long periods (3 hours) • clean own cabin, shower i.e. bending, reaching, scrubbing, and wiping Additional for supply vessels • handle cargo on the back deck of vessel • handle wires, chains and ropes during anchor handling • hook and unhook tows
5. Other	• 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 • shift work when on 4-hourly watch • vessel'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

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- work in oil, other cargo, ballast and water tanks and other confined spaces
 - work in conditions involving heavy rolling and pitching of vessel
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Table 4: Able Seafarer Engine/ Engine Room Rating/Seafarer forming part of an engine room watch

Requirement	Job task
1. Vision	• 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	• 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	• alert to movements of other persons, operating machinery, vessel's small craft and helicopter • monitor equipment including digital and analogue read outs on gauges.
4. Physical	• 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 vessel's small craft • climbing vessel'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, rattle-guns, 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 Additional for supply vessels • handle cargo on the back deck of vessel
5. Other	• 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 • shift work when on 4-hourly watch • vessel'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

Requirement	Job task
1. Vision	• near vision for reading labels, menus, recipes, computer, instructions, orders for stores, invoices, telexes, faxes • near vision for cutting, slicing, cooking • distinguish lights/alarms on galley range
2. Hearing/speech	• give/take instructions • use telephones to contact providores, clients • communicate with vessel's crew • hear alarms
3. Consciousness	• 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 vessel e.g. fire, etc.
4. Physical	• 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, deck-heads, 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	• 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

Appendix B – Guidance in screening for colour vision

B1. Need for good colour vision

Deck officers need to be able to distinguish red, green and white navigation lights to make correct decisions regarding the aspect of an approaching vessel, and regarding what action (if any) needs to be taken to avoid a collision. Confusion between light colours could lead to incorrect decisions, 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 to provide correct advice to the officer of the watch.

Engineering officers and ratings on engine room duty need to be able to distinguish the colour of systems components within the engine room, such as electrical wiring, alarms, and pipe identification.

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

B2. 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.

For deck department personnel 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.

For engine department personnel whose duties require identifying colour components within the engine room, 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.

B2.1 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.

B2.2 Holmes Wright Type B Lantern Test

Standard

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.

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.

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.

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.

A person undergoing the lantern test must not wear a tinted aid to vision for the purpose of passing the test.

The lantern test must be conducted in a room from which daylight is excluded.

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.

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.

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.

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.

If no further mistake is made in the test and the further circuit, the person being tested will be considered to have passed.

If a second mistake is made, the procedure under 4.10 and 4.11 of this Appendix is to be repeated.

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 their eyes or regain composure.

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.

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.

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.

A person who has failed the lantern test may request a further test.

B2.3 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 ensure 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 failed 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.

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