STANDARD
FOR HEALTH ASSESSMENT
OF MARINE PILOTS (NSW)
Acknowledgement:
Based on NTC National Standard for Health Assessment of Rail Safety Workers 2004 (with permission).

Note: The National Standard for Health Assessment of Rail Safety Workers is subject to periodic review. Changes will be considered for relevance to the Standard for Health Assessment of Marine Pilots (NSW) as they occur and will be incorporated if appropriate to the inherent requirements of the marine pilot’s task.
FOREWORD

This Standard for Health Assessment of Marine Pilots (NSW) represents a significant step in the improvement of shipping safety in NSW.

Introduced in October 2009, this Standard is the result of extensive research and input from a wide range of government, industry and medical stakeholders.

The Standard is a non-prescriptive, performance-based standard which adopts a risk management approach. It reflects contemporary medical knowledge and current understanding of the impact of certain health conditions on safe working performance. Contemporary anti-discrimination and privacy principles now legislated in all Australian States and Territories have also been taken into account.

Assessment of marine pilot health against this Standard will be carried out by medical practitioners who have been engaged and trained by NSW Maritime.

The new Standard consists of three Parts:

Part A – Health Assessment Systems for NSW Marine Pilots

Part A is intended for use by NSW port authorities. It outlines the responsibilities of port authorities, marine pilots and health professionals and outlines the interfaces with other legislation.

Part B – Inherent Requirements of Marine Pilots

Part B sets out generic inherent requirements of marine pilot tasks. It also identifies the health attributes (such as senses, musculoskeletal and cardiovascular capacities) needed to fulfill these inherent requirements.

Part C – Health Assessment Procedures and Medical Criteria

Part C is for use by authorised health professionals. It outlines the procedures for conducting health assessments and provides the medical criteria for assessing fitness for duty.

NSW Maritime acknowledges the significant lead role taken by the consultant project team; Dr Bruce Hocking and Ms Fiona Landgren.

NSW Maritime also wishes to thank the NSW Port Corporations, NSW marine pilots, the Australian Maritime Officers Union and other representatives who generously participated in the working group and provided specialised advice.

Steve Dunn
Chief Executive
NSW Maritime
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Ms Jessie Murray, Project Health

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Sydney Pilot Service
Australian Maritime Officers Union
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PART A – HEALTH ASSESSMENT SYSTEM FOR NSW MARINE PILOTS

1. Overview of the standard

1.1 Status

Note: This section explains how the medical standard fits within the regulatory scheme of the Marine Safety Act 1998, its associated Regulations and the proposed new Marine Pilotage Code.

The standard is a minimum standard. Should an agreement be reached at an enterprise level, the standard does not preclude more comprehensive or frequent health assessments. However, those who do implement alternative approaches should consider issues such as anti-discrimination laws and industry interfaces (refer to Section 3.2).

1.2 Purpose

Marine pilots are safety critical workers, which means their action or inaction may lead directly to a serious incident affecting the public or the maritime environment.

The health of marine pilots is therefore an important consideration for public safety, property, economic prosperity and the environment, as well as for the occupational health and safety of themselves and their fellow workers.

A system for monitoring and managing the health of marine pilots has been established to address the risk of ill health. Specifically the system aims to:

- ensure pilots are capable of the inherent requirements of the job at the time of initial licensing; and
- ensure their ongoing fitness for duty.

Health assessments are one aspect of an integrated port operations risk management system aimed at achieving safety in the maritime environment.

1.3 Structure of the standard

The Standard for Health Assessment of Marine Pilots (NSW) comprises the following parts:

A. Health Assessment System: A description of the overall health assessment system and the requirements for application.

B. Inherent Requirements: A description of the inherent requirements and health attributes which form the basis of the health assessment standard.

C. Health Assessment Procedures and Medical Criteria: A description of the health assessments to be conducted by Authorised Health Professionals and the medical criteria to be applied for judging fitness for duty. The medical criteria are presented in chapters corresponding to body system or disease categories and are arranged alphabetically.

The appendix includes model forms.

2. Development and maintenance

These standards are based on those contained in the National Transport Commission’s National Standard for Health Assessment of Rail Safety Workers (2004), and adapted where appropriate to address the specific inherent requirements and risks of the marine pilot’s task.

The maintenance of the standard will be linked to ongoing developments in the rail industry as appropriate, as well as with developments in the inherent requirements of the piloting task.
3. **Interfaces with other health and human resources programs and legislation**

Health assessments interface specifically with a range of other health and human resources programs, as well as with quality and risk management systems, legislation and international conventions.

The interfaces with health and human resources programs are illustrated in Diagram 1. Interfaces should be identified and managed to increase the effectiveness of health assessment programs and to reduce duplication.

3.1 **Occupational health and safety legislation**

Occupational health and safety (OHS) legislation imposes a general duty of care on the port operator and marine pilot regarding risk management. Therefore OHS legislation integrates closely with the proposed *Marine Safety Act* and the *Pilotage Code*.

The focus of the standard is principally the assessment of health and fitness to perform the piloting task. The standard addresses requirements for an individual pilot’s safety but it does not include or replace health monitoring required under OHS legislation. In particular, there are OHS requirements for occupational exposure to noise (see case study below), lead and asbestos. These should be addressed by the port operators and should interface with the health assessment system as required.

**Case Study - Noise Exposure**

Marine pilots are assessed for hearing ability to ensure they can communicate and so work safely. In addition, the *Occupational Health and Safety Regulation 2001* requires audiometric testing at defined times for workers exposed to certain noise levels. Thus, a 30-year-old pilot may only require 5-yearly marine pilot health assessments, yet must have 2-yearly audiometric testing if noise exposure warrants it, for example excessive exposure to noise from helicopters. Port operators must identify such overlaps and manage the process to ensure compliance.

**Diagram 1. Interfacing health and human resources programs**
3.2 Anti-discrimination legislation

Anti-discrimination legislation must be considered by port operators when implementing health assessment systems. The requirements include:

- Health assessments must focus on inherent job requirements, not peripheral requirements. The risk assessment must guide the health assessment process.
- For certain conditions it may be necessary to demonstrate that the condition prevents the pilot from performing the required piloting tasks, for example through practical tests for hearing, neuropsychological conditions or musculoskeletal capacity.
- Any required tests should be valid and their criteria must have a clear rationale. That is, the test must be a good predictor of serious illness regarding safety.
- If a standard must be met at entry, it should be maintained during employment and examined for periodically.
- If a criterion is not met, a port operator should consider reasonable adjustments to the workplace to accommodate the disability.

While public safety considerations take precedence over anti-discrimination, this does not exempt a port operator from addressing discrimination issues.

3.3 Privacy legislation

In administering the marine pilots’ health assessments, port operators must ensure compliance with the Privacy Principles contained in privacy legislation and must ensure that health records are managed and stored in line with the Health Records and Information Privacy Act 2002 and its associated Regulation. Provisions for these specific requirements are described on page 21.

3.4 Drug and alcohol controls

With respect to drugs and alcohol, health assessments have a role in identifying problems associated with dependence, and in identifying and managing the potential effects of prescribed treatment on the pilot’s fitness for duty. Health assessments interface with, but should not substitute, policies to monitor or control drug and alcohol use by pilots.

3.5 Injury management, sick leave, return to work and rehabilitation

Injury management, sick leave policies, return to work and rehabilitation are also likely to interface with health assessments for marine pilots. For example, a pilot on an injury management program could undergo a health assessment to determine fitness for piloting duties or fitness for proposed alternative duties. The assessment will be helpful to the rehabilitation provider.

Repeat injuries may also trigger a health assessment. Port operators should ensure appropriate injury management and ensure that workers compensation personnel monitor repeat injuries and initiate health assessments as required.

Pilots returning from extended sick, maternity or other types of leave may also be required to have a health assessment in order to establish their fitness to undertake piloting duties.

3.6 Incident management

Port operators may have counselling and support programs available for pilots involved in incidents and near misses affecting the safety of ships and the marine environment. Periodic Health Assessments provide a further opportunity to review pilot responses to incidents and to assess general psychological wellbeing. Interfacing these programs supports the effectiveness of the health assessment process and incident management overall.

3.7 Employee assistance programs

Personal and work-related issues can affect work performance. Employee Assistance Programs (EAPs) may be available to help pilots and their families resolve these issues via independent and confidential professional counselling. There is potential for referral to EAP by the Authorised Health Professional.
3.8 Fatigue management

Fatigue is an important consideration for risk management in maritime ports. Periodic health assessments have an incidental role in identifying health problems associated with fatigue (including excessive daytime sleepiness), however they are not a substitute for a fatigue management program.

3.9 Health promotion and health surveillance

The health and fitness of marine pilots may be supported by health promotion programs. These might typically include heart health, nutrition, physical fitness, smoking cessation and skin cancer prevention programs. Health promotion programs however should not be confused with health assessment for fitness for duty.

4. Responsibilities and relationships

The successful implementation of the health assessment standard for marine pilots relies on a clear understanding of the various responsibilities as well as effective communication between the individuals/groups involved. Such communication, including management of health records, should be consistent with the provisions of relevant privacy and health records legislation (refer also to Section 8, Privacy laws, page 21).

Following is a summary of the responsibilities of the key parties and their interrelationships. Diagram 2 illustrates these relationships and the flow of information that should take place in conducting marine pilot health assessments.

Diagram 2. Relationships in the implementation of health assessments for marine pilots
4.1 NSW Maritime
The Minister for Ports and Waterways issues each of the three Port Corporations of Sydney, Newcastle and Port Kembla with a Port Safety Operating Licence (PSOL). The PSOLs set out performance standards for a range of safety functions, including marine pilot licensing. NSW Maritime plays an active role in monitoring the effectiveness of the PSOLs through its participation in formal auditing of the Port Corporations.

4.2 Port operators
In NSW, there are four port operators:
- Newcastle Port Corporation;
- Port Kembla Port Corporation;
- Sydney Ports Corporation (responsible for the Port of Botany Bay and Port Jackson); and
- NSW Maritime (responsible for the regional Ports of Yamba and Eden).

As employers and licensing authorities for marine pilots (under delegation from the Minister for Ports and Waterways), these port operators have a responsibility to protect the safety of the public. This includes a responsibility to ensure that the health and fitness of pilots is monitored and does not jeopardise marine safety.

As employers, port operators also have a duty of care under occupational health and safety legislation to the safety of their pilots.

The final decision regarding fitness for duty or fitness to hold a pilots’ licence, rests with the port operator and involves consideration of the advice of health professionals as well as anti-discrimination and retraining issues.

Where possible, subject to reasonable operational requirements, port operators will accommodate the limitations of the pilot’s capabilities due to health issues through strategies such as job modifications, alternative duties or supervision as appropriate.

Port operators also have a responsibility to ensure privacy principles are maintained with respect to pilots’ personal and health information (refer to Section 8, page 21).

If employing contractors, the port operator is required to inform them of their obligations to ensure appropriate health assessment systems are in place for their marine pilots.

4.3 Marine pilots
Marine pilots have a duty of care to themselves and others. Once employed, they should know their job, its implications for safety and the importance of their health and fitness to marine safety.

They have a responsibility to notify their operator of any temporary or ongoing health condition or change in health status that is likely to affect their ability to perform their work safely. They must also comply with any review requirements of a health assessment and they are obliged to be truthful in imparting health information to the examining Authorised Health Professional.

Marine pilots may request referral to an Authorised Health Professional if they are concerned about their ability to perform their work safely due to health reasons.

4.4 Authorised Health Professionals
Health assessments for NSW marine pilots should be conducted only by Authorised Health Professionals who have undertaken appropriate training in relation to the application of the standard and have had suitable practical experience of the tasks involved in marine piloting.

The method of appointment is determined by NSW Maritime in consultation with the Port Corporations (refer to Table 1 for criteria).

The Authorised Health Professionals should conduct health assessments in line with the procedures contained in this document (Part C). The appointment criteria should be consistent with Guidelines for Conducting Pre-sea and Periodic Medical Fitness Examinations for Seafarers, ILO/WHO/D.2/1997.

The relationship between the health professional and the pilot/patient is governed by the ethics of the relevant health profession and by privacy laws. The relationship differs from the usual
doctor-patient relationship because of the involvement of a third party, the port operator.

The Authorised Health Professional should not provide personal or medical information to the port operator, only information regarding work capacity (refer to Section 8, page 21).

The Authorised Health Professional should liaise with the pilot’s general practitioner and treating specialists where appropriate to clarify information relating to the pilot’s current health status. Such communication should occur with the consent of the pilot and should be limited to health issues that impact on marine safety.

The ongoing treatment and management of medical conditions is the responsibility of the pilot’s general practitioner. Authorised Health Professionals should communicate and consult with the general practitioner and other relevant providers to ensure the effective management of the pilot’s health.

### Table 1. Criteria for selection of Authorised Health Professionals

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<td>Marine Industry Knowledge:</td>
<td>The health professional should demonstrate a working knowledge of the pilotage environment including work performed and risks involved.</td>
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<tr>
<td>The Standard:</td>
<td>The health professional should demonstrate familiarity with the <em>Standard for Health Assessment of NSW Marine Pilots</em>, including:</td>
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<td>• appreciation of the role of health assessments in ensuring marine safety;</td>
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<td>• specific knowledge of the Inherent Requirements of the marine pilot’s job and the rationale for health assessments applied;</td>
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<td>• knowledge of and ability to perform the Marine Pilot Health Assessment;</td>
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<td>• understanding of requirements and reporting options for fitness for duty;</td>
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<td>• knowledge of the administrative requirements of health assessments, including form completion and record keeping;</td>
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<td></td>
<td>• understanding of ethical and legal obligations and the ability to conduct health assessments accordingly, including appropriate communication with the pilot and the port operator; and</td>
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<td></td>
<td>• understanding of ethical issues in relationships with the treating doctor/general practitioner.</td>
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<tr>
<td>Interfacing Policies and Programs.</td>
<td>The health professional should be able to demonstrate awareness of legislation, policies or programs that might interface with or affect the performance of the health assessment, for example, drug and alcohol policy, critical incident management programs, anti-discrimination legislation and privacy legislation.</td>
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5. Types of health assessments

There are three types of health assessments for marine pilots (Initial licensing, Periodic and Triggered).

- **Initial licensing** aim to confirm that a marine pilot candidate is medically suited to the tasks to be performed;
- **Periodic assessments** monitor the marine pilot's health during employment to detect conditions that might affect safety; and
- **Triggered assessments** enable a timely response to concerns about the pilot’s health.

Diagram 3 shows how the different types of health assessments work together to support ongoing fitness for duty. The health assessments are described in more detail below.

5.1 Initial Licensing Health Assessments

Marine pilots require a health assessment as a condition of initial licensing. The assessments are aimed at determining a pilot’s fitness for duty based on the inherent requirements (refer to Part B).
5.2 Periodic Health Assessments

Periodic Health Assessments aim to identify health conditions that may affect safe performance of piloting duties. They should be conducted for marine pilots according to the defined frequencies, from the time of initial licensing:

- 5 yearly to age 50 then
- 2 yearly to age 60 then
- Yearly thereafter

An Authorised Health Professional may recommend more frequent assessments for the purpose of health surveillance (refer to 5.3 Triggered Health Assessments), depending on the needs of the individual pilot. For example, a pilot found to have diabetes may be judged Fit Subject to Review and assessed annually.

Ongoing treatment of medical conditions should continue to be the responsibility of the pilot's general practitioner.

The program of comprehensive Periodic Health Assessments should be maintained even if more frequent Triggered Health Assessments are performed for an individual's particular condition.

5.3 Triggered Health Assessments

Triggered Health Assessments aim for early intervention and appropriate management of health problems likely to affect safety. They are conducted during the period between scheduled Periodic Health Assessments in response to incidents or concerns that arise regarding the pilot's ability to perform their job safely.

In particular they enable identification and management of illnesses that are of unpredictable and rapid onset and that may not be identified at Periodic Assessment. For example, psychological conditions such as anxiety states are not age dependent and their onset patterns are not clearly defined.

Triggered Health Assessments may interface with a range of other performance management strategies including retraining and employee assistance.

To ensure appropriate referrals and transparency in decision-making, port operators should develop clear referral criteria for Triggered Health Assessments.

Examples of trigger situations include:

Scheduled Review Assessments (Fitness for Duty Subject to Review)

Health assessments scheduled for pilots who have been assessed Fit for Duty Subject to Review or Temporarily Unfit for Duty Subject to Review (as described in Section 7, page 20) are the most common triggered referrals. They are more frequent than standard Periodic Health Assessments to allow for closer monitoring of a health condition. Review intervals are recommended by the Authorised Health Professional.

Return to work after injury, sick leave or pregnancy

Given the considerable general physical and cardiorespiratory fitness requirements of the piloting task, Triggered Health Assessments may be particularly important in ensuring fitness for duty following an injury or long absence due to illness or pregnancy.

In the case of injury, the assessments should interface with and support the pilot's rehabilitation plan.

Sick leave and patterns of absenteeism

Recurrent absenteeism may also flag the need for referral for health assessment. Sick leave review systems should support and validate such referrals.

Accident/Incident patterns

Accident/incident patterns may indicate pilot difficulties or health issues. Incident investigation and management procedures should consider potential health (including psychological) issues and should require referral for health assessment as appropriate.

At pilot's request

Pilots should report to the port operator any illness or health problem likely to affect their ability to work safely. Such reports may trigger a health assessment.
6. **Nature of health assessments**

Marine pilots are required to undergo a comprehensive physical and psychological assessment at initial licensing and periodically during employment.

The assessment aims to assess the pilot’s ability to meet the general physical demands of the tasks, including cardiorespiratory fitness, musculoskeletal capacity and acuity of vision and hearing.

The assessment comprises a health questionnaire and a general clinical examination. Referral for further tests or a further medical opinion may be required.

The assessment may also include drug screening depending on the requirements of the individual port operator.

6.1 **Health questionnaire**

This self-administered questionnaire (see Appendix 1, page 118) collects a general history and helps screen for specific conditions that might affect marine pilot performance, including:

- sleep disorders (Epworth Sleepiness Scale);
- alcohol dependency (AUDIT Questionnaire); and
- psychological problems (K10 Questionnaire).

The questionnaire also seeks information about:

- whether the pilot has experienced difficulty in performing piloting work;
- whether they have been involved in any accidents or near misses at work; and
- whether they have tested positive to drugs or alcohol in the period since their last assessment.

The questionnaire is not diagnostic and no decision should be made regarding fitness for duty until the clinical examination is complete.

6.2 **General clinical examination**

The clinical examination assesses the key health attributes required for marine piloting work. There are two main aspects of the piloting task: the skills required on the bridge to navigate the vessel, and the skills required to dis/embark the vessel (refer to Part B Inherent Requirements, page 15). These require a mix of high level physical and mental well-being which are assessed as follows.

6.2.1 **Senses**

The clinical examination includes assessment of vision (including colour vision and acuity), hearing, speech and balance.

6.2.2 **Cardiorespiratory fitness and musculoskeletal capacity**

The piloting task involves considerable physical exertion and coordination. A maximal oxygen uptake (VO2 max) test is therefore required along with a comprehensive musculoskeletal assessment.

6.2.3 **General health**

Good general health is required in order to meet the complex physical and psychological demands of the task. Pilots are assessed for conditions such as heart disease, diabetes, epilepsy, sleep disorders, alcohol and drug dependence etc.

The assessment also includes a predictive element. Marine pilots must have a Cardiac Risk Score assessment to identify their risk of cardiovascular disease, and specifically their risk of collapse or sudden incapacity from heart attack or stroke.

6.2.4 **Cognitive capacity**

Cognitive capacity is an important health attribute for marine pilots. The examination therefore aims to identify psychological or neurological conditions that may impact on the pilot’s ability to undertake work safely. This includes excessive daytime sleepiness.

Detailed instructions for carrying out the clinical examination are included in Part C (page 44).

6.3 **Practical tests**

In some situations, a clinical assessment may need to be supplemented by a practical test to confirm fitness for duty. For example, practical tests for musculoskeletal capacity may be applied to confirm the pilot’s ability to conduct the particular tasks required.
Practice pilot ladders are available on land in Sydney and Newcastle. Neuropsychological capacities may be assessed on computer simulators. Scale model pilotage simulation is also available.

### 6.4 Drug and alcohol screening

Port operators have a responsibility to ensure that marine pilots are not impaired by alcohol or drugs when performing their work. Marine pilots themselves also have a duty not to perform piloting duties whilst impaired by alcohol or drugs.

Initial Licensing Health Assessments may include a drug screen if this is required by the port operator.

Periodic Health Assessments generally do not include a drug screen. However, assessment for drug or alcohol dependence is an aspect of the Periodic Health Assessment.

The standard includes guidance and criteria for Authorised Health Professionals to assess drug or alcohol dependence as well as guidance for managing a situation where acute drug or alcohol impairment is suspected at a Periodic Health Assessment.

<table>
<thead>
<tr>
<th>Table 2. Summary of health assessment requirements for marine pilots</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Health Assessment Required</strong></td>
</tr>
<tr>
<td><strong>Initial Licensing Health Assessments</strong></td>
</tr>
<tr>
<td>Health Assessment including:</td>
</tr>
<tr>
<td>• Marine Pilot Health Questionnaire and history</td>
</tr>
<tr>
<td>• Vision and hearing assessment</td>
</tr>
<tr>
<td>• Cardiorespiratory fitness test (VO₂ max) and musculoskeletal assessment</td>
</tr>
<tr>
<td>• Comprehensive clinical examination including physical and psychological aspects and a Cardiac Risk Score</td>
</tr>
<tr>
<td>Additional health assessments may be implemented to meet OHS requirements.</td>
</tr>
<tr>
<td><strong>Periodic Health Assessments</strong></td>
</tr>
<tr>
<td>Health Assessment including:</td>
</tr>
<tr>
<td>• Marine Pilot Health Questionnaire &amp; history</td>
</tr>
<tr>
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</tr>
<tr>
<td>Additional health assessments may be implemented to meet OHS requirements.</td>
</tr>
<tr>
<td><strong>Triggered Health Assessments</strong></td>
</tr>
<tr>
<td>Nature of health assessment will depend on the triggering circumstances.</td>
</tr>
</tbody>
</table>
7. Fitness for duty classifications

Fitness for duty is expressed in terms of one of a number of classifications as described below and summarised in Table 3.

Note that:
- determinations may be combined; and
- a particular pilot may move from one classification to another as they progress through the medical assessment and investigation process.

**Fit for Duty**

This indicates that the person has met all the criteria in the standard and is to be reviewed in line with the normal Periodic Health Assessment schedule.

**Fit for duty – Conditional**

This classification indicates that the pilot is fit for duty conditional on them wearing/using items such as spectacles or hearing aids.

**Fit for Duty Subject to Review**

This indicates that the person has not met all the criteria in the standard, however the condition in question is sufficiently under control that normal duties may be permitted. Continuation of normal duties would be conditional on the person being reviewed more frequently than the Periodic Health Assessment schedule requires (Triggered Assessment). The review period is specified by the Authorised Health Professional.

An applicant may be classified Fit Subject to Review at initial licensing/recruitment, indicating that employment would be conditional on them attending more frequent health assessments than required for a standard Periodic Health Assessment.

**Fit for Duty Subject to Job Modification**

This indicates that the person has not met all the criteria in the standard, but could continue piloting duties (or, in the case of a new recruit, be judged medically suitable for piloting duties) if suitable modifications were made to the job, subject to reasonable operational requirements.

It is recognised that in most cases suitable job modification may not be practicable for marine pilots. Modification should be considered on a case by case basis and the subject is covered in general terms within any Enterprise Agreement. For example, in some situations, where helicopter transfer is available, work may be limited to this mode for an agreed time* (Note. Other OHS requirements such as capacity for underwater escape will need to be considered). A health professional may also recommend roster changes in cases of fatigue.

The period required for job modifications is decided based on discussion between the Authorised Health Professional and the port operator.

**Temporarily Unfit for Duty Subject to Review**

This indicates that the pilot has not met all criteria in the standard and cannot undertake piloting work at present but may do so in the near future. This category may be applied for a number of different reasons. It may be that a condition has been found and it is anticipated that it will improve with treatment. The pilot would be reviewed following treatment to determine fitness status. This differs from ordinary short-term illness causing absence from duty.

It may also be applied in situations where a clear diagnosis has not been made in the case of an undifferentiated illness, for example where a pilot is being investigated for blackouts. The Authorised Health Professional should advise the port operator about the duration of the period for review (so that roster changes can be made). A pilot who is assessed as Temporarily Unfit for Duty may be assessed fit for non-safety critical alternative duties (i.e. non-piloting duties) or may be judged fit subject to job modification, as described above).

In the case of Initial Licensing Health Assessments, an applicant judged Temporarily Unfit for Duty would not be considered fit to hold a license, however they may be reassessed in the future if the medical issue(s) were to be resolved, for example by obtaining glasses to meet the visual standard.
### Table 3. Health Assessment Outcome Categories for Marine Pilots – Interpretation for initial licensing, ongoing fitness for duty and ongoing licensing

<table>
<thead>
<tr>
<th>OUTCOME CLASSIFICATION</th>
<th>INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial licensing</td>
</tr>
<tr>
<td>Fit</td>
<td>Fit to obtain a pilot’s licence – no restriction.</td>
</tr>
<tr>
<td>Fit Subject to Review</td>
<td>Fit to obtain a pilot’s licence (must have more frequent periodic assessment and meet conditional medical criteria).</td>
</tr>
<tr>
<td>Fit Subject to Job Modification</td>
<td>Not a licensing issue. Generally if significant modification is required the person will not be fit to obtain a pilot’s licence.</td>
</tr>
<tr>
<td>Temporarily Unfit</td>
<td>Not fit to obtain a pilot’s licence. May reapply when health issue satisfactorily addressed.</td>
</tr>
<tr>
<td>Permanently Unfit (Unfit for duty &gt;1yr)</td>
<td>Not fit to obtain a pilot’s licence.</td>
</tr>
</tbody>
</table>

Given this advice, the licensing authority may advise the applicant that they may reapply in the future.

**Permanently Unfit for Duty**

This indicates that the pilot has not met all criteria in the standard, their condition is likely to be long term (12 months or more) and they will not be able to undertake piloting work in the foreseeable future. Options for redeployment to other work compatible with a pilot’s health condition / capabilities may be considered on a case by case basis. This classification is likely to have an impact on pilot licensing. The subject should be covered in general terms within any Enterprise Agreement.

### 8. Privacy laws

In administering the marine pilot health assessments NSW Maritime, port operators and Authorised Health Professionals must ensure they comply with the Privacy Principles contained in privacy legislation and that health records are managed and stored in line with the *Health Records and Information Privacy Act 2002* (the Act).

#### 8.1 Privacy policy

The Act requires organisations to have a privacy policy for health information. This includes provision for ensuring pilots are clearly informed about:

- the purpose for collecting and storing the health information;
• what information will be stored and where;
• the fact that they can access it; and
• to whom the information may be disclosed.

8.2 Primary purpose

Only information justifiably necessary to assess fitness for duty should be collected. Thus, port operators cannot ask an Authorised Health Professional to collect information that is not relevant to the health requirements of the piloting task.

Similarly, information must only be disclosed for the primary purpose for which it was collected. Thus, port operators cannot provide the Authorised Health Professional with information that is not relevant to the health assessment. Authorised Health Professionals also cannot provide information back to the port operator that is not relevant to management of the pilot and their fitness for duty.

8.3 Information disclosure

Health information should be reported on a need to know basis from a health professional to the port operator.

The Authorised Health Professional must not disclose the pilot’s clinical records to the port operator. Pilot/patient consent must be obtained to disclose any health information to a third party unless permitted by law as with workers’ compensation.

Port operators need to understand how a pilot’s ability to undertake their job might be affected by a health condition (e.g. their ability to climb a pilot’s ladder, their ability to see instruments or their ability to hear radio communication). They do not need to know the exact nature or details of the underlying medical conditions (e.g. high blood pressure, otosclerosis, diabetes) or how it is being managed.

Thus, the Authorised Health Professional is not prohibited from giving port operators advice about fitness to perform specific tasks, provided he or she does not refer to the pilot’s medical details. However, it is possible that in seeking to manage a medical condition, such as during the port operator’s discussions with the pilot regarding alternative duties or job modification, the diagnosis may become self-evident.

When appropriate, it is helpful if the consent of the pilot can be gained to disclose the nature of the condition(s) to the port operator to facilitate a sensible plan of health management.

Where an Authorised Health Professional seeks information from a pilot’s general practitioner or treating doctor to clarify the pilot’s current health status, such communication should occur with the consent of the pilot and should be limited to health issues that impact on the ability of the pilot to undertake tasks.

An external medical consultant may be given access to individual health records for the purposes of audit in order to ensure consistency and quality of health assessments for marine pilots in the organisation. Where such records are accessed, confidentiality must be assured and systems must be in place to ensure internal personnel do not access records. This is consistent with privacy provisions.

8.4 Maintenance and storage of information

Information should be kept accurate, up to date and protected from loss and unauthorised use.

Records may be scanned and kept in electronic form. The pilot’s signature on the completed Health Questionnaire is legally valid after scanning.

8.5 Audit

Medical records may be audited by a medical specialist appointed by NSW Maritime. They should report in aggregate terms, not about individuals.
9. Administrative systems

9.1 Health assessment database

The port operator should establish an appropriate database and procedures to help administer health assessments. The database should identify:

- the due date for each pilot's assessment; and
- any restrictions or conditions on the pilot's fitness for duty, such as wearing glasses or having more frequent health assessments for monitoring purposes.

It should be managed so that timely reminders to supervisors and pilots are issued and followed up.

A pilot's health assessment status must be kept confidential and released only as required to the pilot, the supervisor and the Authorised Health Professional.

9.2 Health assessment forms

Model forms are provided in Appendix 1 as a template for operators to develop their administrative processes and procedures. There are three forms:

- Health Assessment Request and Report form (BLUE);
- Health Assessment Notification and Health Questionnaire (PINK); and
- Health Assessment Record for Health Professional (GREEN).

The forms are colour coded (blue, pink, green) to facilitate use by the Authorised Health Professional and the port operator.

Administrative detail on the forms may be altered consistent with a port operator’s requirements. The provisions for reporting from the Authorised Health Professional to the port operator (on the blue form) and the content of the Marine Pilot’s Health Questionnaire (on the pink form) represent standardised data collection and should not be altered.

The model forms are also consistent with privacy principles. The port operator should ensure any changes made to the forms are consistent with the Health Records and Information Privacy Act 2002.

Use of the forms is described below and in Diagram 4.

9.2.1 Health Assessment Request and Report Form - BLUE Form

This form facilitates communication between the port operator and the Authorised Health Professional. The port operator completes relevant details regarding the pilot and the type of assessment requested. The Authorised Health Professional summarises fitness for duty assessment findings on the form and returns it to the port operator. Medical data is not conveyed, only functional capacity.

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Diagram 4. Use of health assessment forms

- **Health Assessment Request and Report Form (BLUE)**
  - Port operator completes relevant details and provides to AHP.
  - AHP completes and returns to port operator. AHP retains copy for pilot’s medical record.

- **Health Assessment Notification Form and Pilot Questionnaire (PINK)**
  - Port operator completes relevant details and provides to pilot.
  - Pilot completes questionnaire and provides to AHP.

- **Health Assessment Record for Health Professional (GREEN)**
  - Port operator completes relevant details and provides to AHP.
  - AHP reviews questionnaire and retains for pilot’s medical record.
  - AHP completes and retains in pilot’s medical record.
9.2.2 Health Assessment Notification and Health Questionnaire for Marine Pilots - PINK Form
This form notifies the pilot of the requirement to attend a health assessment. It includes:
- the reasons for the assessment;
- the instructions for the pilot; and
- the Health Questionnaire, which the marine pilot completes before attending the assessment appointment.

9.2.3 Health Assessment Record for Authorised Health Professionals - GREEN Form
This form guides the Authorised Health Professional through the assessment process and provides a standard clinical record. The port operator issues the form but, since it will contain details of the clinical findings, it is retained by the Authorised Health Professional rather than returned to the port operator.

9.3 Medical tests
The standard tests required for all Initial Licensing and Periodic Health Assessments are
- audiometry;
- electrocardiogram (ECG);
- blood test for cholesterol, glucose and haemoglobin; and
- a cardiorespiratory (VO₂ max) test. Conduct of these tests should be arranged with the Authorised Health Professional so that results are available at the time of the assessment.

Additional tests may be ordered by the Authorised Health Professional based on findings of the initial assessment.

9.4 Communication with pilots
The port operator should establish communication mechanisms to alert pilots of health assessment requirements, including alerts to management and pilots if systems are breached.

9.4.1 Before the assessment
The pilot should receive adequate notice of the due date for their health assessment and the consequences of not presenting for the assessment in that timeframe. In line with privacy principles and the general requirements of the assessment, the notification should include advice on:
- the purpose of the assessment;
- who will conduct the assessment;
- who will receive the assessment report;
- the pilot’s responsibility to provide accurate information; and
- the requirement to take photo ID to the appointment and to any tests. Specific procedures should be developed by each port operator to explain general requirements for the health assessment. This should include:
- the requirement to take glasses, hearing aids or other aids to the appointment;
- the requirement to complete the Health Questionnaire prior to attending the appointment;
- the requirement to take current medication (or a list of it) to the health assessment appointment (including prescription, over the counter and alternative medicines);
- the requirement to attend prescribed tests including, for Initial Licensing and Periodic assessments:
  - audiometry;
  - ECG; and
  - blood tests for cholesterol, glucose and haemoglobin; and
  - a cardiorespiratory (VO₂ max) test.

9.4.2 After the assessment
On receipt of the Health Assessment Report Form (Blue Form), where the pilot has been assessed as other than Fit for Duty, the operator should discuss with the pilot any implications for their work and the policies or arrangements to be applied.
A record of such arrangements should be kept on the database together with the outcomes of the health assessment and any requirements for review assessments.

9.5 Communication with the Authorised Health Professional

9.5.1 Before the assessment
The Authorised Health Professional should not perform the health assessment without the appropriate forms consistent with those provided in Appendix 1.

The port operator should provide the Authorised Health Professional with the Request and Report form (BLUE), the Record for Health Professional form (GREEN) and supporting information relevant to the pilot’s health assessment. The pilot takes the Notification and Health Questionnaire form (PINK) to the health assessment.

9.5.2 Supporting information
For a Periodic Health Assessment, relevant supporting information should be made available to the Authorised Health Professional to support their awareness of relevant work and health related history. At a minimum, this includes the previous health assessment report (BLUE form).

Additional information may include any significant change in sick leave patterns or other information considered relevant to the assessment.

The Authorised Health Professional can request more information if required.

9.5.3 After the assessment
The Authorised Health Professional should contact the port operator immediately by phone if the pilot is Unfit for Duty but should not reveal details of the pilot’s medical condition without the pilot’s consent.

For privacy reasons, the health professional should not return the report form (BLUE) to the port operator via fax, unless confidentiality can be assured.

The port operator should keep all documentation confidentially and securely in compliance with the Health Records and Information Privacy Act 2002.
Diagram 5. Conducting a marine pilot health assessment for fitness for duty / licensing

PORT OPERATOR:
- alerts pilot of requirement to attend for health assessment;
- provides pilot and Authorised Health Professional with appropriate forms;
- advises Authorised Health Professional of tests to be ordered including audiology / pathology / ECG / (if Initial Licensing or Periodic Assessment);
- provides additional information as relevant to the assessment including previous health assessment report.

PILOT:
- presents for audiology / pathology / ECG / tests as required and attends assessment as required;
- brings all current medication;
- brings photo identification;
- completes Health Questionnaire.

AUTHORISED HEALTH PROFESSIONAL:
- confirms identification;
- reviews Health Questionnaire and other information;
- undertakes health assessment in accordance with the Assessment Procedures and Medical Criteria (Part C);
- liaises with treating doctors/specialists and pilot’s general practitioner to confirm health status.

FIT FOR DUTY SUBJECT TO JOB MODIFICATION
- Does not meet all medical criteria, but could work if suitable modifications were made to the job.

FIT FOR DUTY
- Meets all relevant medical criteria.

FIT FOR DUTY CONDITIONALLY
- Fitness for duty is conditional upon wearing devices such as glasses or hearing aid.

FIT FOR DUTY SUBJECT TO REVIEW
- Does not meet all medical criteria, but could work if condition is sufficiently under control and person reviewed.

FIT FOR DUTY SUBJECT TO JOB MODIFICATION
- Does not meet all medical criteria, but could work if suitable modifications were made to the job.

TEMPORARILY UNFIT FOR DUTY
- Does not meet all medical criteria and cannot work at present, but will be reviewed to determine status.

PERMANENTLY UNFIT FOR DUTY
- Does not meet the medical criteria and cannot perform the job in the future.

Authorised Health Professional completes Health Assessment Report (blue form) in accordance with findings indicating:
- recommendations regarding fitness for duty;
- recommendations regarding frequency of ongoing review as appropriate;
- recommendations regarding specialist review/referral as appropriate;
- recommendations regarding practical assessment and job modification as appropriate.

Authorised Health Professional also:
- advises and counsels pilot accordingly;
- communicates as appropriate with the pilot’s general practitioner;
- forwards report to port operator and communicates by phone as required to discuss appropriate action;
- retains copy of report (blue form) all forms on file.

PORT OPERATOR:
- makes a decision regarding the pilot’s fitness for duty based on the doctor’s recommendation.
- advises and implements appropriate practical assessment such as simulator test;
- advises and implements appropriate job modifications consistent with reasonable operational requirements;
- advises and implements appropriate medical reviews;
- advises and implements redeployment as required;
- maintains appropriate records and schedules dates for review as appropriate.

PILOT:
- attends specialist consultations as required;
- attends follow-up review appointments as required.
1. Introduction

Determination of the inherent requirements of a pilot’s job is fundamental to a risk management approach to pilot health.

The term inherent requirements has been variously defined.\(^1\)\(^,\)\(^2\) Most simply, the inherent requirements of a job may be described as the essential activities of the job: the core duties that must be carried out in order to fulfil the purpose of the position. This definition encompasses the broad requirements of the job, not just those related to health (refer to Diagram 6).

This section of the standard sets out ‘generic’ inherent requirements of marine pilot tasks based on a review of tasks across NSW ports. It also identifies the health attributes (such as senses, musculoskeletal and cardiovascular capacities) needed to fulfil these inherent requirements. This in turn provides the basis for applying the medical criteria, which are set out in Part C of this standard.

Each port operator should conduct their own risk assessment and address any additional local risks identified.

An understanding of the inherent requirements also helps to identify those attributes that cannot be readily assessed through a medical examination (e.g. cognitive capacities) and for which other assessment tools may be required.

Diagram 6. Inherent requirements as a basis for health standards and pilot competencies

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Diagram 7. Risk management of safety critical workers

1. **STEP 1 – CONTEXT**
   - Legislation, Business environment
   - Environment and systems

2. **STEP 2 – IDENTIFY SAFETY TASKS**

3. **FOR EACH TASK IDENTIFIED**

4. **STEP 3 – IDENTIFY INHERENT REQUIREMENTS**
   - Identify the activities that made up the tasks (inherent requirements)

5. **STEP 4 – IDENTIFY SAFETY CONTROLS**
   - Identify existing local safety controls (e.g. training, engineering controls, fatigue management, audit etc)

6. **STEP 5 – HEALTH ATTRIBUTES**
   - Evaluate health attributes required to undertake the activities safely

7. **STEP 6 – ANALYSE RISK**
   - Analyse risk based on nature of activities, nature of existing safety controls and health attributes and the safety consequences of ill health

8. **STEP 7 – CONSIDER ADDITIONAL RISK CONTROL**
   - Identify whether additional procedural or engineering controls could be introduced to further mitigate risk

9. **STEP 8 – ACCEPTANCE OF RISK**
   - Decide whether to accept residual risk or not to perform task

10. **STEP 9 – MEDICAL CRITERIA AND HEALTH ASSESSMENT REQUIREMENTS**
    - Match medical criteria and health assessments to the health attributes
2. The context of pilotage work

2.1 Risk exposures

The pilot's role is to provide advice to a ship's master regarding safe passage of a ship through pilotage waters. The potential consequences of failures in marine pilot operations are considerable and may include:

- ship grounding;
- collision with a bridge or wharf;
- collision with another ship;
- collision with small craft;
- inappropriate drop of anchors; or
- girding a tug.

In turn, such incidents have the potential to result in:

- serious injury and loss of life;
- environmental damage;
- property and infrastructure damage;
- commercial damage to port and trade;
- disruption of transport; and
- damage to reputation.

These are very considerable risks. There are critical phases during a pilotage when it is likely the Master would not be capable of maintaining the safety of the ship without the expertise of the pilot. Health effects may also result in poor decision making which may not be obvious to the bridge team. Thus the work of a pilot should be regarded as 'safety critical work'.

2.2 Selection and training

Selection and training procedures reflect the high skill requirements of the pilotage task and the considerable risks involved.

Marine pilots are currently selected from experienced masters or officers. As such they have a wide experience of ships, navigation, personnel management and dealing with unforeseen circumstances.

Pilots undergo extensive training and examination as required by legislation. They train under supervision of senior pilots prior to licensing and progress through licence levels under supervision.

2.3 Bridge Resource Management and quality control

Bridge Resource Management (BRM) is a key system for ensuring personnel and vessel safety. It has been introduced throughout Australia, and by many other trading nations, as a method to improve interaction, particularly cross-cultural, between pilots and captains and officers of ships.

The system focuses on a range of human and technical resources to support operational safety and risk management on the bridge, including teamwork, open communication, leadership and decision-making.

In addition, a program of quality control is in place which includes an annual audit of each pilot's performance by a senior pilot.

3. The inherent requirements of pilotage

Piloting is a highly complex task, which involves rapidly integrating extensive knowledge of ships and navigation in an unpredictable environment. It may also involve considerable physical exertion for embarking and disembarking ships.

In general terms, the pilot's work may be considered in two main areas of activity:

- **Cognitive tasks (Piloting)** – Before boarding a vessel to pilot it in or out of port, the marine pilot is required to plan the course of the vessel taking into account tides, weather, size weight and operational characteristics of the vessel and if there is a need for tugs. The marine pilot then has responsibility for navigating the vessel safely in and out of the harbour and needs to work very closely with the captain, other members of the crew and support services, to achieve this. They need to be able to use the ship's navigational and communications equipment, liaising with other vessels and the port control centre. Mental calculation of another vessel's movements based on information from VHF either directly from the vessel or via port control is also required.
• **Physical tasks (Embarking/ Disembarking)** – Marine pilots are required to disembark from or embark to ships via small high-powered launches often in rough seas. This involves climbing/descending high ladders to access vessels. Alternatively, in some ports marine pilots access vessels via helicopters landing on the vessel.

These activities are described in more detail in Table 4 (pages 31-39).

4. **Health attributes required for pilots’ work**

Based on the inherent requirements of piloting described in Table 4, the health attributes required by marine pilots are described in Table 5 (pages 40-42). These health attributes highlight the unusual mixture of high-level physical and mental capacities required for pilotage.

The necessary health attributes are described under four main categories although there is some overlap between them.

- **Senses.** These attributes include vision, balance and hearing (and speech).
- **Psychological/cognitive capacity.** These attributes include attentiveness and cognition which may be impaired for example by psychiatric, neurological and sleep disorders as well as by hypoglycaemia associated with diabetes.
- **Musculoskeletal capacity.** These attributes refer to locomotor capacities of limbs and back, coordination of movement, stamina and agility.
- **General health.** These attributes refer to general stamina and (absence of) conditions which may cause collapse, including cardiovascular disorders, epilepsy, hypoglycaemic coma, etc.
### Table 4. Inherent requirements

#### A. PILOTING

**Overview of requirements and environment**

Piloting is a highly complex task which involves rapidly integrating extensive knowledge of ships and navigation in a potentially unpredictable environment. This requires considerable concentration, judgement, forethought and stamina.

In most ports, pilots work rosters to enable provision of services day and night (24 hours, seven days a week). Rostering systems and hours of work vary depending on the port - not all pilots are on rosters, e.g. in regional ports. Shipping movements are irregular which leads to unpredictability in work times.

In the course of the pilots work there is extensive exposure to sunlight (ultraviolet) directly from the sun when on an open bridge, as well as reflection from the water. There may also be prolonged exposure to hot sun on open wings when berthing, particularly at special moorings such as for petroleum.

**Planning and trip preparation**

At the outset of each piloting task the details of the ship (draft, displacement, length, type of cargo etc) and berth/destination are provided to the pilot so that the route to be navigated may be planned. Resources such as available tugs and other shipping movements are made known to the pilot. Winds and tides and events such as sailing regattas are noted.

Bridge resource management begins on arrival at the bridge when the proposed route is discussed with the captain. Critical characteristics of the ship such as its dead weight, draft, actual speed at "dead slow" and bow thrusters etc are then confirmed.
### Table 4. Inherent Requirements (cont)

#### A. PILOTING (cont)

**Navigating and ship manoeuvring**

Navigation proceeds under the control of the pilot to control a vessel along a defined route into or out of port.

Using aids to navigation and detailed knowledge of the port, the pilot continually uses a high level of judgement for giving advice on commencing turning and slowing of engines, depending on the mass and length of ship, steering characteristics, wind and tide conditions. In some situations, there is virtually no room for error.

The services of tugs to push or pull are integrated into manoeuvring the ship by the pilot using a hand held radio. When berthing, the services of line boats and linemen are also integrated (by radio) for the "controlled collision" of vessel and wharf. The pilot’s aim is to avoid damage to the ship and port facilities or injury to linemen. The pilot may be required to walk from wing to wing of the bridge (quickly in an emergency) to observe clearances.

It should be noted that the use of Global Positioning Systems (GPS) and navigation software programs assist the pilot in determining the position of the ship with great accuracy. These programs can also display predicted movement of the vessel such as rate of turn and use during very fine manoeuvring while close to the alongside position.
Part B. Inherent Requirements of Marine Pilots

Table 4. Inherent Requirements (cont)

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<th>A. PILOTING (cont)</th>
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Navigating and ship manoeuvring (cont)

The pilot continually scans ahead for navigation aids. These are often coloured red or green and sometimes other colours; coloured lights need to be recognized at night. Navigation aids may be on land or buoys of various shapes according to maritime standards. Visibility may be reduced in rain or poor light at dawn or from the glare of port lights at night, etc.

On the bridge large dial type-instruments such as for compass bearings and speed are read at a distance of 1-5+m. The pilot checks these instruments to confirm his or her directions are being correctly implemented by the crew (particularly if there are language barriers).

At nighttime the demands on visual function are high. The bridge is darkened with instruments softly back-lit. This permits maximum dilation of the pupils of the pilot (and crew) to provide optimum ‘night vision’ for navigation such as for detecting channel lights or other ships. In contrast, when berthing at a wharf, such as a container wharf which has extensive flood lighting, there may be brilliant illumination of the wings of the bridge where the pilot is standing which causes constriction of the pilot’s pupils. Rapid accommodation by the eyes may be required to change between such contrasting light perspectives.

In the daytime, sunlight can cause glare, which reduces vision, and the ultraviolet component can contribute to certain types of cataract formation; (see footnote)

Footnote: Cataract development has been shown in studies in fishermen HR Taylor, SK West, FS Rosenthal, B Munoz, HS Newland, H Abbey, and EA Emmett. New Eng J Med. Effect of ultraviolet radiation on cataract formation 1988; 319(22);1429-1433.
<table>
<thead>
<tr>
<th>A. PILOTING (cont)</th>
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<tbody>
<tr>
<td><strong>Communication</strong></td>
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<tr>
<td>All orders (whether spoken directly or via radio) are given using &quot;closed loop communication&quot; whereby an order is repeated back to the pilot confirming the essence of the order. For example, orders are spoken to the helmsman and confirmed. The noise levels on the bridge are moderate and ordinary conversation is possible. When maneuvering the ship from an open bridge wing, wind and rain can interfere with communication and a sheltered place needs to be found. Radio contact is made on an open channel with harbour control and tugs. Radar and Automated Information Systems (AIS) are other forms of communication that assist with collision avoidance and vessel identification.</td>
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**Emergency situations**

Emergency situations can arise from numerous causes including equipment failures such as loss of engine power, steering failure, tug line breaking, radio communication failure or high gusty winds. These situations require instant knowledge of the pilotage waters at the time in relation to the characteristics of the ship. The pilot continually scans ahead for unpredictable hazards such as inexperienced yachtsman or recreational fishermen - as distinct from experienced ferry masters or commercial fishermen. In such an event expert judgement is required about sounding the ship’s whistle, using radio communication or making avoidance manoeuvres.  |

Pilot using radio-communication on an open channel to ensure good communication between all parties.  

Yacht dead ahead. The pilot must make a rapid judgment regarding safety.
B. EMBARKING AND DISEMBARKING

Overview of requirements and environment

Boarding arrangements at sea vary between ports, with the majority occurring via pilot cutter while the ship is in motion.

This makes the task of embarking and disembarking ships at sea hazardous and demanding. It requires getting onto/off a ladder from/onto a cutter, climbing a vertical ladder up to 9m long, sometimes in adverse weather with the ship and cutter rolling at different rates, and at night with reduced visibility. The pilot is not roped to a safety harness.

The task may be performed up to 4 times in a 10-hour shift, depending on the port and duration of pilotage. Sometimes the 9m long ladder leads to a lowered accommodation ladder, which the pilot also climbs in order to board the vessel.

In addition some ships do not have lifts and the equivalent of up to seven storeys of steep stairs may need to be climbed to the bridge.

Alternative boarding arrangements via helicopter are outlined on page 38.
Part B. Inherent Requirements of Marine Pilots

Table 4. Inherent Requirements (cont)

B. EMBARKING AND DISEMBARKING (cont)

The pilot cutter and crew

A pilot cutter is specifically designed for the job with handrails and a non-slip deck.

A secured deck hand has a critical role in assisting the pilot onto and off the ladder. He assists the pilot ascend by holding ropes and pushing the pilot up to clear the cutter, and on descent uses his arms to hold the pilot secure when boarding. The deckhand and pilot communicate by voice (shout) or in noisy conditions (i.e. bad weather) use hand signals.

The cutter master has to continually manoeuvre the cutter to be against the ship and position the pilot and deck hand in relation to the ladder. If this is not done properly the pilot can fall, or be crushed, between cutter and ship.

Ladder climbing technique

The technique of ladder ascending and descending varies greatly between pilots. The man-ropes are often used to gain a foothold. Some pilots use these for the entire ascent or descent but others use the side ropes on the ladder.

Critical judgement is needed in a rough sea regarding timing for gaining/leaving the ladder from/to the cutter. There is potential for the pilot’s leg to be jammed between the cutter and the ship, for the pilot to land violently on the deck or fall overboard. Ladder climbing is the major cause of injuries to pilots.
Ladders are designed according to Regulation 17 of the *International Convention for the Safety of Life at Sea, 1974* and Australian Standard 2933 *Ship Building - Pilot Ladders* (1987, reproduced from ISO 799). The ladder is 9m long. The steps are spaced 30-38cm apart and are 40cm wide and 11.5cm deep. The doubled side ropes of the ladder have a diameter of 20mm each and the man-ropes are 28mm in diameter.

Ropes in good repair are strong enough to hold great weights. However the quality of ladders and associated rigging varies greatly.

The position and integrity of the ladder is checked by cutter crew and pilot before use. If the ladder fails the pilot needs to hold onto the man-ropes.

Note: The ergonomics and risks of use of ladders have been the subject of a recent report ‘A risk assessment of pilot ladder transfers’, by Fiona Weigall and Katrina Simpson, (Health and Safety Matters Pty Ltd, 2005). This report should be referred to for information regarding improved ladder design, safety clothing and work organisation, which are beyond the terms of reference of this document. The report is the property of Sydney Ports Corporation.
Table 4. Inherent Requirements (cont)

B. EMBARKING AND DISEMBARKING (cont)

Boarding via helicopter

In Newcastle, helicopters are extensively used to ferry pilots to and from ships. This is partly due to the high number of coal carrying and similar types of ships, which can accommodate a helicopter landing site.

Helicopters eliminate the need to climb the pilot’s ladder and the risks associated with this, although some ships' helipads have poor access from the deck and require pulling or jumping up onto it. Also there is still a need to climb 6 - 7 flights of stairs to the bridge.

However, some ships visiting the Port of Newcastle require access via the conventional pilot ladder and cutter. Poor weather when helicopters are unable to fly also necessitates the use of pilot ladder and cutter to board/disembark all ships.

Therefore, while Newcastle marine pilots often use helicopters, the need to climb ladders remains an inherent requirement of their work.

One risk to health associated with helicopters is noise, which can induce hearing loss, which in turn may affect communication in pilotage. This risk should be managed as per state OHS regulations.

Further risks associated with flying in helicopters are crashing or being struck by rotor blades, which are beyond the scope of this standard.
B. EMBARKING AND DISEMBARKING (cont)

Emergency procedures for man overboard

A major risk in the pilot’s work is falling into the sea at the time of boarding or leaving the cutter or from the collapse of a ladder.

For this reason pilots wear lifejackets to remain afloat. In addition the cutter crew has extensive training in ‘man overboard’ rescue practices. The cutter master and crew move to emergency controls in the stern; a platform is lowered into the water; and a crewmember retrieves the pilot using a boat hook.

The temperature of the water as well as injuries sustained in the fall will influence survival of the pilot. However, apart from general cardiovascular fitness there are no specific health attributes of the pilot which will contribute to survival.
Table 5.  Health attributes

<table>
<thead>
<tr>
<th>PILOTING</th>
<th>EMBARKING AND DISEMBARKING</th>
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<tr>
<td>The following health attributes are important to the task of piloting:</td>
<td>The health attributes required to safely embark or disembark the ship are quite different from piloting.</td>
</tr>
<tr>
<td>- <strong>Senses</strong></td>
<td>- <strong>Senses</strong></td>
</tr>
<tr>
<td>- <strong>Vision.</strong> There are high visual demands within the bridge and particularly externally. The need to read charts and instruments requires near and intermediate visual acuity. The need to continually survey the external environment under conditions of varying visibility for navigation aids and unpredictable events requires far visual acuity, full visual fields and colour vision. The demand on colour vision is greatest at night as isolated red or green points of light need to be recognised to determine the course of a craft; unlike traffic lights there is no redundancy of information from position. If it is necessary to look into the dark (and back again) rapid accommodation by the eyes is required. Sunlight can cause glare, which reduces vision, and the ultraviolet component can contribute to certain types of cataract formation, thus eye protection is necessary (refer to note below for consideration of protection options).</td>
<td>- <strong>Vision.</strong> On the ladder, the pilot requires sufficient vision to see steps and ropes and general position with regard to the ship and the cutter or helicopter.</td>
</tr>
<tr>
<td>- <strong>Hearing (and speech).</strong> Hearing and clarity of speech is important for communication on the bridge and on the ladder. On the bridge the use of ‘closed loop communication’ is an important safety feature for both local conversation and radio communication. If a pilot does not hear someone speak correctly, then on repeating it back to the sender the error is likely to be identified. The background noise on bridges varies but generally is low enough for conversation with the helmsman and captain. Radios have the ability to adjust sound levels in bad conditions but are difficult to use in the wind. The pilot needs to be able to process audiological input from several sources including radio and voice at the same time.</td>
<td>- <strong>Hearing.</strong> On descending the ladder to the cutter, the ability to communicate with the deck hand is important. A system of hand signals is used in situations where noise precludes voice communication.</td>
</tr>
<tr>
<td>- <strong>Balance.</strong> When embarking and disembarking the ship by the pilot ladder, there is a high demand on sense of balance. This is particularly so in bad weather with the ship rolling and the cutter tossing. This health attribute may be affected by disorders of balance such as Meniere’s disease and other disorders of the vestibule (organ of balance) in the inner ear or head injury/whip-lash causing post-traumatic vertigo.</td>
<td>- <strong>Balance.</strong> When embarking and disembarking the ship by the pilot ladder, there is a high demand on sense of balance. This is particularly so in bad weather with the ship rolling and the cutter tossing. This health attribute may be affected by disorders of balance such as Meniere’s disease and other disorders of the vestibule (organ of balance) in the inner ear or head injury/whip-lash causing post-traumatic vertigo.</td>
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<td>PILOTING</td>
<td>EMBARKING AND DISEMBARKING</td>
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| **Psychological/Cognitive Capacity**  
There is a high demand for continual attentiveness, cognitive capacity and decision-making when on the bridge. These attributes may be impaired by
- psychiatric conditions such as anxiety-depression or Alzheimer's disease;
- neurological conditions such as after a stroke or head injury;
- sleep disorders such as obstructive sleep apnoea. (It is noted that most port operators have in place a system of fatigue management and the medical assessment of sleep disorders should be seen as integral to this);
- medications, prescribed and over the counter;
- hypoglycaemia associated with diabetes;
Collapse is a further consideration with respect to cognitive performance, which is covered under general health below. | **Psychological/Cognitive Capacity**  
On the ladder there is need for quick judgement when moving to or from the cutter. A similar range of conditions to those affecting working on the bridge (psychiatric, neurological and sleep disorders) may impair this judgement.  
There is a need to be able to work at heights and in exposed conditions on the ladder. (This attribute is not easily assessed medically and the employment history gives a better guide).  
Collapse is a further consideration with respect to cognitive performance, which is covered under general health below. |
| **General health**  
On the bridge, in addition to cognitive performance, avoidance of collapse is important. Various medical conditions may impair this necessary health attribute including:
- cardiovascular conditions such as ischaemic heart disease or arrhythmias;
- epilepsy;
- hypoglycaemic coma associated with diabetes;
- stroke;
- syncopal (fainting) episodes.                                                                                                      | **General health**  
As on the bridge, avoidance of collapse on the ladder is crucial. Various medical conditions may cause collapse including:
- cardiovascular conditions such as ischaemic heart disease or arrhythmias;
- epilepsy;
- hypoglycaemic coma associated with diabetes;
- stroke;
- syncopal (fainting) episodes.                                                                                                      |
| On the ladder the pilot also needs to have considerable cardiovascular and respiratory capacity for climbing 9m vertically (and often additional flights of stairs when on board). Various medical conditions may impair this necessary health attribute including:
- cardiovascular disease including ischaemic heart disease or arrhythmias;
- respiratory disease such as advanced chronic obstructive lung disease or severe asthma;
- anaemia. |
Table 5. Health attributes (cont)

<table>
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<tr>
<th>PILOTING</th>
<th>EMBARKING AND DISEMBARKING</th>
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<tr>
<td><strong>Musculoskeletal Capacity</strong>&lt;br&gt;Once on the bridge, the musculoskeletal demands are modest. The pilot is mainly walking about the bridge but requires stability of legs on a rolling ship. In an emergency the pilot may be required to move rapidly from wing to wing.</td>
<td><strong>Musculoskeletal Capacity</strong>&lt;br&gt;When embarking or disembarking using the ladder there is a very high demand on musculoskeletal health attributes. Ladder climbing requires a full range of movement and good power of neck, back arms and legs. This is particularly so in conditions of bad weather.</td>
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This medical analysis of the various health attributes associated with climbing the pilot ladder whilst technically reasonable tends to understate the need for integration of several body systems in a short time period. This is relevant to the assessment for pilot ladder climbing discussed in Part C.

NOTE: Eye protection: Protection of the eyes is desirable for various reasons as described above. Conventionally this type of protection is achieved with the use of Polaroid sunglasses. Unfortunately polarised sunglasses have technical incompatibilities with various equipment found on ships. For example some ships have polarised glass around the bridge but if the pilot is wearing polarised sunglasses the interaction results in a mottled image which affects navigation. In addition some instrument displays use LED and part of this image may be distorted by Polaroid lenses which is potentially hazardous. This information may need to be drawn to the attention of professionals who prescribe glasses.
PART C – HEALTH ASSESSMENT PROCEDURES AND MEDICAL CRITERIA

1. Introduction

This section is for the guidance of AHPs conducting the health assessments for marine pilots. It outlines the health assessment procedures and the medical criteria for assessing fitness for duty.

The medical criteria are arranged in chapters alphabetically according to body system or medical condition. Each chapter provides general information about the body system/condition and its effects on safety, and then provides advice about the assessment of the body system/condition. The table in each chapter sets out the criteria to be met for fitness for duty.

The main focus of the medical criteria is on serious conditions that would impact on the ability to perform piloting duties. The criteria emphasise function in relation to the job rather than being based on diagnosis or impairment. Specialist advice may be useful regarding assessment in some cases.

For each of the chapters the levels of evidence for fitness for duty criteria are noted according to the National Health and Medical Research Council (NHMRC) requirements3. Where a level of evidence is not specified by these requirements, criteria have been developed based on expert opinion.

2. General considerations

2.1 Generic assessment

The medical criteria chapters provide detailed guidance regarding the majority of major medical conditions. However, it is not possible to cover the complete range of conditions that may need to be considered by an examining health professional.

A generic approach may be applied in situations where conditions or symptoms are encountered which are not covered in the standard. This approach also applies to the situation where there are multiple minor conditions where concern may arise regarding their net effect on safety of the pilot and pilotage. This may occur, for example, in the setting of degenerative disease or multiple trauma after a motor car crash.

The basic principle in such assessments is to be mindful of the inherent requirements of pilotage and the associated necessary health attributes to meet the requirements. These matters are discussed in detail in Part B, Inherent Requirements, page 27.

Clinical judgement is then required regarding assessing the severity of the condition in relation to the demands of performing the pilotage job safely. It is desirable that the examining doctor has first-hand understanding of the job requirements to make this assessment with insight. Where necessary, additional tests may be required or discussions with the pilot’s treating doctors or others may be helpful.

The determination regarding fitness for duty should be conveyed to the port operator using the usual classifications such as ‘fit for duty’ (refer to Part A, Section 7, Fitness for Duty Classifications, page 20).

When appropriate it is helpful if the consent of the pilot can be gained to disclose the nature of the condition(s) to the port operator to facilitate a sensible plan of health management.

It is important that good clinical notes be kept for future reference. These should include:

- the symptoms and relevant clinical findings used for diagnosis;
- the assessment regarding fitness for duty with regard to the necessary health attributes;
- the determination and advice given to the pilot and port operator; and
- whether consent of the pilot has been provided for contacting their treating doctor.

2.2 Undifferentiated illness and fatigue

A marine pilot presents with symptoms, which could have implications for their job, but the diagnosis is not clear. Referral and investigation of the symptoms will mean that there is a period of uncertainty before a definitive diagnosis is made and before the pilot and port operator can be confidently advised.

Each situation will need to be assessed individually, with due consideration being given to the probability of a serious disease which will affect the piloting task.

Generally, a marine pilot who presents with symptoms of a potentially serious nature, for example chest pains, blackouts, delusional states or dizzy spells, should be categorised Temporarily Unfit for Duty until their condition can be adequately assessed. However, they may be categorised as fit for alternative duties which are not safety critical.

Of particular relevance are the various non-specific symptoms of fatigue that may affect pilots. These include feeling tired, drained or exhausted sometimes with an associated loss of alertness, poor judgement and irritability; (sleepiness may not be a feature). Fatigue may arise in conjunction with the demands of irregular rosters or for other reasons. Pilots often have records of their rosters which may help in diagnosis and treatment.

2.3 Temporary illnesses

The standard does not presume to deal with the myriad of conditions that may affect health on a short-term basis and for which a marine pilot may be referred for assessment regarding fitness to resume duty. Such conditions may include recurrent respiratory infections, post-major surgery, severe migraine, fractures to limbs or stress.

Clinical judgment is usually required on a case-by-case basis although the text in each chapter gives some advice on the clinical issues to be considered. Some conditions primarily affect a pilot’s ability to use the pilot ladder but do not affect their ability to perform pilotage functions. In such cases transfer by helicopter, if available, may be considered.

3. Health assessment procedures for authorised health professionals

The administrative, clinical and reporting procedures which should be followed by the Authorised Health Professional in conducting health assessments for marine pilots are described below. Further detail in relation to the conduct of the specific aspects of the clinical assessment and the interpretation of test results is included in the chapters following this section of the standard.

3.1 Appointments

An appointment for an assessment will be made either by the port operator or the pilot.

Prior to the appointment, the port operator will forward to the Authorised Health Professional and the pilot the relevant forms and documentation. The health professional should not conduct the assessment without the appropriate forms (refer to Section 3.2 below).

3.2 Forms and supporting information

Forms are included in Appendix 1 of the standard and include:

- **Health Assessment Request and Report Form (BLUE Form)**, which will indicate the type of health assessment required (e.g. Initial Licensing, Periodic or Triggered);
- **Health Questionnaire (PINK Form)**, which the pilot should have completed and brought to the appointment; and
- **Health Assessment Record for Health Professional (GREEN Form)**, which guides the clinical examination and provides a standardised template for recording a general assessment of fitness for duty.

The port operator will also send relevant supporting documentation to the Authorised Health Professional. At a minimum, this should include a copy of the report from the previous health assessment (BLUE form). Additional information such as a summary of sick leave may also be included if relevant to
Part C. Medical Criteria for Marine Pilot Health Assessments

the assessment. The Authorised Health Professional may seek further information from the operator if required to undertake the assessment.

3.3 Tests required

Marine pilots are required to have a number of tests before attending an assessment. For an Initial Licensing or Periodic Health Assessment these tests include:

- audiometry; and
- an electrocardiogram (ECG); and
- fasting blood tests for glucose, cholesterol and haemoglobin; and
- maximal oxygen uptake test (VO2 max).

These should be completed in advance so that the results are available at the health assessment.

The marine pilot will also be asked by the port operator to bring all medications or a list of their medications to the appointment.

3.4 Facilities and equipment

The examination room should be well lit, quiet and offer privacy. Equipment should include:

- Snellen chart and Times-Roman chart (40cm and 100cm) for visual acuity tests);
- Ishihara plates (24 plate edition) for colour vision test;
- 6kg weight for musculoskeletal assessment;
- 12” (30cm) box for step test (or refer for VO2 max test);
- sphygmomanometer;
- scales and height measure; and
- lap top/PC for recording data and calculating risk score (optional).

3.5 Orienting the pilot/patient

To orient and inform the pilot about the health assessment procedure:

- if it is the first assessment for the pilot, formally explain the purpose of the health assessment and that the results will be discussed with them;
- confirm their identity; and
- formally explain Privacy Principles: that all clinical and health information will remain confidential and will not be forwarded to the port operator without the pilot’s consent.

The report (blue form) provided to the port operator will be in functional terms in relation to the pilot’s fitness for duty, as indicated on the form. However in the event of an abnormality being found, it is helpful if the pilot will consent to appropriate information being made known so that a plan of management can be developed. The Authorised Health Professional should ask the pilot to sign the front page of the ‘Pink Form’ stating that they have understood the privacy principles.

3.6 Marine pilot questionnaire

A marine pilot attending for an Initial Licensing or Periodic Health Assessment should bring a completed Health Questionnaire (PINK Form). The assessment should not proceed unless this has been completed.

The Authorised Health Professional should review the pilot’s responses to the questionnaire and elicit further information as required.

Scores should be calculated for various sections of the questionnaire and the results recorded on the Health Assessment Record for Health Professional (GREEN Form). These sections include:

- Epworth Sleepiness Scale (Question 6);
- alcohol AUDIT questionnaire (Question 7); and
- K10 questionnaire (Question 8).

The Authorised Health Professional should clarify and discuss aspects of the questionnaire as required.

The pilot should be asked to sign the questionnaire as a truthful statement. The Authorised Health Professional then countersigns and dates the completed questionnaire (last page of ‘PINK Form’).

3.7 Clinical assessment

When examining a pilot to assess their fitness for duty, the health attributes (as set out in Part B, pages 40-42) which are required to meet the inherent requirements should be considered. The functionality of various body systems should be addressed as outlined below. They are described in further detail in the medical criteria chapters which are arranged
Part C. Medical Criteria for Marine Pilot Health Assessments

alphabetically by body system or major condition commencing on page 50.

Additional tests or referral to a specialist may be required if and when clinical examination raises the possibility of potentially significant problems. It may be necessary to contact the treating doctor to clarify information regarding the pilot’s health. This must be done with their consent.

The following guidance on conduct of the clinical examination is based around the four main health attributes: senses, general health and stamina, musculoskeletal capacities and cognition.

3.7.1 Senses
The history should be complemented with the test results for hearing and vision.

**Hearing**
If facilities are available, the Authorised Health Professional may conduct audiometry according to procedures outlined on page 86. Alternatively, assessment by an audiologist should be arranged prior to the assessment.

**Vision**
*Visual acuity* is tested with a Snellen chart that includes at least five letters on the 6/12 line, at a distance of 6m (or scaled to 3m). The Authorised Health Professional should explain the process to the pilot and ask them to read lines near the top to familiarise them with the chart.

Visual acuity should be measured one eye at a time (monocularly) without correction in the first place. More than two errors in reading the letters of any line is regarded as a failure to read that line. Correction may then be added to reassess the acuity.

Near vision should be assessed using the Times-Roman chart.

*Colour vision* is assessed using the Ishihara plates (12 screening plates of the 24 plate edition). More than 3 errors is a fail in which case further assessment is required.

*Fields.* The Authorised Health Professional sits about 1 metre from the pilot and asks him/her to look at the Authorised Health Professional’s nose. The Authorised Health Professional extends their arms to be halfway between them and the pilot and just within the health professional’s own field of vision. The pilot is asked to indicate when they notice the Authorised Health Professional’s finger movement. The test should be performed at 180° right and left, and various other points.

Any defect in visual field should lead to referral for detailed assessment.

**Balance**
The assessment should involve observation of the pilot’s gait and performance of a Romberg Test for balance (refer to page 88)

3.7.2 General health (stamina and conditions that may cause collapse)
The history should be complemented with the physical examination and the results of the Cardiac Risk Score and maximal oxygen uptake (VO₂ max). Other conditions which may cause acute incapacity such as syncope will mainly be elicited from the history.

**Cardiorespiratory examination**
The cardiorespiratory examination should include:

- blood pressure - this may be taken sitting or supine. If blood pressure is ≥150/95 it should be repeated after 15 minutes supine;
- pulse rate;
- heart sounds;
- chest examination; and
- peripheral pulses.

Calculation of the Cardiac Risk Score is based on pilot’s age and sex, whether they are a smoker, blood pressure, ECG results, fasting cholesterol (total and HDL) and fasting plasma glucose. For scoring, see *Cardiovascular Diseases* (page 58).

Cardiorespiratory fitness is assessed by measuring maximal oxygen uptake (VO₂ max). Various tests may be used. A protocol for the step test is included on page 62 of the standard. In assessing cardiorespiratory fitness the Authorised Health Professional should also consider the blood haemoglobin result.

The abdomen should also be examined but a genital or rectal examination is not routinely required unless there is an indication to do so based on the history.

3.7.3 Musculoskeletal capacity, and body mass
The history should be complemented with various tests of physical strength and calculation of body mass.
A comprehensive musculoskeletal assessment, including assessment of strength, agility and coordination should be carried as described on page 88 and as set out in the assessment form (page 114).

The assessment should also involve observation of the pilot’s gait (refer to page 88).

A further consideration is the pilot’s Body Mass Index (BMI), which is relevant to the pilot’s ability to climb the pilot ladder safely. Some allowance should be made for body composition because very muscular persons may have a high BMI but will be fit and therefore at low risk when climbing the pilot ladder (refer to page 90).

3.7.4 Cognitive/psychological well-being

The history and the scores of specific questionnaires (ESS, K10, AUDIT) are the prime source of information regarding conditions that may affect cognition.

Sleep

The Authorised Health Professional should consider the results of the Epworth Sleepiness Scale score (Question 6 of the Marine Pilot Health Questionnaire) together with relevant history and clinical signs.

If the ESS score is raised (≥16) or other clinical findings warrant it, the findings should be discussed with the pilot to determine possible explanations. An approach to management should be agreed, for example, referral to the pilot’s general practitioner, referral to a sleep clinic for polysomnography, or a letter to management about possible roster changes (Fit for Duty Subject to Job Modification). Depending on the score and the clinical picture, the pilot may need to be immediately classed Temporarily Unfit for Duty pending further assessment (refer to Sleep Disorders, page 103).

Psychological health

Consider the result of the K10 questionnaire (Question 8 of the Marine Pilot Health Questionnaire) together with other relevant history and clinical signs, as well as any accident/incident patterns reported by the port operator/employer.

If the score is raised (≥19) or other clinical observations warrant it, the findings should be discussed with the pilot to determine possible explanations such as work stress, domestic crises or endogenous causes. An approach to management of the condition should be agreed such as referral to the pilot’s general practitioner or to a psychiatrist or to an Employee Assistance Program.

In some cases the pilot will need to be immediately classed Temporarily Unfit for Duty pending further assessment. For detailed guidance in interpreting the K10 score see Psychiatric Disorders, page 96.

Drug and alcohol dependence or impairment

The main purpose of the health assessment with respect to alcohol is to examine for harmful drinking patterns or alcohol dependence.

The Authorised Health Professional should consider the result of the AUDIT Questionnaire (Question 7 of the Marine Pilot Health Questionnaire) together with relevant history, and/or clinical signs. Refer to Alcohol Dependence and Impairment (page 50), for guidance on managing the pilot in relation to the score.

If during an Initial Licensing or Periodic Health Assessment, the examining health professional identifies apparent acute alcohol impairment, this should be managed according to the specific chapter Alcohol Dependence and Impairment (page 50).

In cases where the pilot shows impairment they will need to be immediately classed Temporarily Unfit for Duty. If dependency is apparent, the health professional will need to make a judgement regarding fitness for duty pending further assessment.

Details of management of drug screening and interpretation of results is beyond the scope of this standard.

Drug screening may be required for Initial Licensing Health Assessments or for a specifically referred Triggered Health Assessment. Screening should be conducted in line with Australian/New Zealand Standard 4308:2001: Procedures for the Collection, Detection and Quantification of Drugs of Abuse in Urine.

If during an Initial Licensing or Periodic Health Assessment, the examining health professional identifies impairment, which has no apparent medical basis, this should be managed according to the specific chapters addressing Drugs (Illicit and Prescribed or OTC) pages 77 and 80.
In cases where the pilot shows impairment they will need to be immediately classed Temporarily Unfit for Duty. If dependency is apparent the health professional will need to make a judgement regarding fitness for duty pending further assessment.

3.8 Additional tests and marine specific resources

There are additional tests and marine specific resources that may assist with the assessment. For example, neuropsychological capacities may be assessed on computer simulators in Launceston (Tasmania) and will soon be available in Brisbane.

Scale model pilotage simulation is available at Port Ash (NSW). http://users.hunterlink.net.au/~mbbinp/.

Land-based practice ladders are also available in Sydney and Newcastle.

3.9 Specialist referral

The pilot’s condition may warrant referral to a specialist. In such cases the Authorised Health Professional should explain fully to the specialist the nature of the piloting task and the concerns regarding health status of the pilot. The specialist report should be sent to the Authorised Health Professional for interpretation and reporting, not to the port operator. The person may need to be classified Temporarily Unfit while health status is being resolved in which case the port operator should be promptly advised of the likely duration.

3.10 Informing and counselling the pilot

The Authorised Health Professional should advise the pilot of the results of the assessment and where relevant, about the ways in which their condition may impair their ability to perform their duties. As part of this process:

- the pilot becomes better informed about their health and fitness in general;
- the nature of any condition and the extent to which he or she can maintain control over it;
- the importance of regular medical review; and
- the need for medication where appropriate.

Should the pilot be found Unfit for Duty, the Authorised Health Professional should take a conciliatory and supportive role while explaining fully the risks posed by the pilot’s condition with respect to marine piloting.

The Authorised Health Professional should be alert to and refer to interfacing programs as appropriate (refer to Part A, page 11).

3.11 Reporting to the port operator

All pilots must be classified regarding their fitness for duty. The possible classifications regarding fitness for duty are set out in Part A, Section 7, page 20.

- Fit for Duty
- Fit for Duty Conditional
- Fit for Duty Subject to Review
- Fit for Duty Subject to Job Modification
- Temporarily Unfit for Duty
- Permanently Unfit for Duty

Should the pilot be assessed as Unfit for Duty either temporarily or permanently, the Authorised Health Professional should notify the port operator immediately by phone to discuss the implications of the assessment and to allow the port operator to make appropriate roster arrangements. The Authorised Health Professional should not discuss specific clinical information, only recommendations in terms of fitness for duty including any necessary job modifications.

In all cases the Authorised Health Professional should complete the health assessment report (BLUE form). This should not include any clinical information. Only the functional assessment of fitness for duty or otherwise, and any recommendations regarding specialist review or job modifications and the like should be reported to the port operator.

The Health Questionnaire (PINK Form) and Health Assessment Record (GREEN Form) should not be returned to the port operator.

3.12 Record keeping

Appropriate records should be maintained by the Authorised Health Professional including:

- completed Health Questionnaire (PINK Form);
- completed Health Assessment Record (GREEN Form) (the last page is
Part C. Medical Criteria for Marine Pilot Health Assessments

particularly important and may be subject to audit);
- copies of test results;
- copy of the report form sent to the port operator (BLUE Form);
- copies of relevant supporting information; and
- any additional clinical notes.

In addition and in accordance with legislation:
- the pilot’s medical records should be made available to them on request;
- the pilot’s medical records are subject to confidentiality; and
- records may be scanned and kept in electronic form. The pilot’s signature on the completed Health Questionnaire is legally valid after scanning.

Medical records may be subject to audit by a medical specialist appointed by NSW Maritime or the port operator. Audit will be for purposes of quality assurance and feedback to the Authorised Health Professional and will not disclose individual results.

3.13 Communicating with the pilot’s general practitioner and other health professionals

The Authorised Health Professional should ensure an ethical relationship with the pilot’s general practitioner and other treating professionals, and should ensure continuity of care is maintained.

Reference to the general practitioner should be made for ongoing treatment requirements, for management of lifestyle issues and to discuss issues such as medication side effects.

The Authorised Health Professional should obtain the pilot’s consent if needing to contact their general practitioner or treating specialist to clarify information relating to the pilot’s health condition.

It is inappropriate for a pilot’s general practitioner to be the Authorised Health Professional as there may be a conflict of interest.

4. Medical criteria

The detailed assessment processes, medical criteria and general management guidelines for health assessment of marine pilots are contained in the following chapters.
1. ALCOHOL DEPENDENCE AND IMPAIRMENT

1.1 RELEVANCE TO MARINE PILOTS

1.1.1 Alcohol impairment and legislative requirements

Alcohol consumption is well known for the acute effects it has on vigilance and reaction times, and hence increased risk of an error and accident occurring.

Legislation therefore requires that marine pilots not conduct piloting activities, or be permitted to conduct such activities, when under the influence of alcohol or other drugs.

This standard supports alcohol policies through the provision of advice to Authorised Health Professionals regarding the management of suspected impairment at the time of health assessment. However specific procedures for drug and alcohol screening are beyond the scope of this standard.

1.1.2 Harmful drinking and alcohol dependence

In addition to the acute effects of alcohol, prolonged intake may lead to alcohol dependence, which typically includes a strong desire to consume alcohol, impaired control over use, persistent drinking despite harmful consequences, a higher priority given to drinking than to other activities and obligations, increased alcohol tolerance, and physical withdrawal reaction. Such effects are incompatible with the conduct of safety critical work such as marine piloting.

Alcohol dependency is a particular concern, exemplified by the disproportionately high number of alcohol dependent drivers involved in road vehicle crashes. Prolonged alcohol abuse leads to effects on end organs such as the brain or peripheral nerves or liver, which may lead to further impairment of safety.

1.2 EFFECT OF HABITUAL INTOXICATION ON OTHER DISEASES

Persons who are frequently intoxicated and who also suffer from certain other medical conditions are often unable to give their other medical problems the careful attention required.

1.2.1 Alcohol and epilepsy

Many patients with epilepsy are quite likely to have a seizure if they miss their prescribed medication even for a day or two, particularly when this omission is combined with inadequate rest, emotional turmoil, irregular meals and alcohol. Patients under treatment for any kind of epilepsy are unfit for marine piloting if they are frequently intoxicated.

1.2.2 Alcohol and diabetes

Patients with diabetes and on insulin have a special problem when they are frequently intoxicated. Not only may they forget to inject their insulin at the proper time and in the proper quantity, but also their food intake can get out of balance with the insulin dosage. This may result in a hypoglycaemic reaction or the slow onset of diabetic coma. Such persons should not perform safety critical work such as marine piloting.

1.2.3 Alcohol and medication

Some medications are incompatible with ingestion of alcohol (for example some sedatives). Where alcohol is thought to be a problem, the examining health professional should advise the patient accordingly and consider alternative medication where available. If the medication is likely to cause any level of impairment, the examining health professional must take appropriate steps to restrict marine piloting work while the pilot is on medication, for example, reporting the pilot as Temporarily Unfit for Duty while on the medication.

1.3 ALCOHOL AND ILLICIT DRUGS

The use of alcohol in association with a number of ‘recreational’ drugs such as marijuana exacerbates their effect and significantly increases the risk of an error. Therefore where alcohol is thought to be a problem, consideration should also be given to illicit drug use and appropriate steps should be taken (refer to page 77).

1.4 ASSESSMENT OF ALCOHOL DEPENDENCE AND IMPAIRMENT

The main purpose of the health assessment with respect to alcohol is to examine for hazardous or harmful drinking patterns or alcohol dependence.

Clinical assessment is supported by the inclusion of the Alcohol Use Disorders Identification Test (AUDIT) in the Marine Pilot Health Questionnaire. Application and interpretation of the AUDIT is described in detail on page 52. The examining health professional should consider the AUDIT score together with relevant history and clinical signs.

Tests of blood alcohol are not routinely required at Periodic Health Assessment, but biochemical tests for alcohol abuse may be conducted if clinically indicated or if referred for a triggered assessment. The pilot should be classified Fit for Duty Subject to Review or Temporarily Unfit for Duty as appropriate to the clinical appraisal.

In the event of a person presenting for a Periodic Health Assessment with evidence of impairment, an assessment of the impairment should be conducted and the person managed as shown in Diagram 8.

1.5 MEDICAL CRITERIA

Medical criteria for fitness for duty are outlined in the table on page 51.
Diagram 8. Periodic health assessment – management of possible impairment due to alcohol or drugs (illicit or prescription/OTC)

Is there evidence of impairment?
Preliminary Impairment Assessment (speech, eyes, breathing, skin, actions, movements, balance, attitude, comprehension).

YES

Discuss with worker
Is there a medical basis for impairment, i.e. medical condition causing impairment or prescription/OTC medication taken for a defined purpose.

YES

Medical basis
- Classify Temporarily Unfit for Duty.
- If appropriate, discuss medication with general practitioner/treating doctor in order to resolve impact on employment.
- If appropriate, refer to relevant chapter for medical conditions.
- Identify review period.

NO

No further action (continue with health assessment)

NO

If suspect alcohol or illicit drug use:
- Classify Temporarily Unfit for Duty and advise on report impairment without clear medical basis.
- Contact employer regarding impairment without clear medical basis and await further instructions from employer.

MEDICAL CRITERIA FOR MARINE PILOTS – ALCOHOL

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol Impairment</td>
<td>The criteria for <em>Fit for Duty</em> are not met:</td>
</tr>
<tr>
<td></td>
<td>- if the pilot is impaired by alcohol.</td>
</tr>
<tr>
<td></td>
<td>Refer to Diagram 8 for management.</td>
</tr>
<tr>
<td>AUDIT Questionnaire</td>
<td>If the person has an AUDIT score of 8 or greater the person may be classified <em>Fit for Duty Subject to Review</em> or <em>Temporarily Unfit for Duty</em> while causes are being assessed and managed. Refer to page 52 for detailed management.</td>
</tr>
<tr>
<td>Alcohol Dependency</td>
<td>The criteria for <em>Fit for Duty</em> are not met:</td>
</tr>
<tr>
<td></td>
<td>- if there is alcohol dependency; OR</td>
</tr>
<tr>
<td></td>
<td>- if the pilot has a strong history of alcohol abuse and clinical evidence of abuse is limited to biochemical findings without clinical signs.</td>
</tr>
<tr>
<td></td>
<td><em>Fit for Duty Subject to Review</em> may be recommended, taking into account the opinion of an appropriate specialist and the nature of the work:</td>
</tr>
<tr>
<td></td>
<td>- if the pilot has stopped drinking for a substantial period; AND</td>
</tr>
<tr>
<td></td>
<td>- the pilot demonstrates good evidence of insight into the problem; AND</td>
</tr>
<tr>
<td></td>
<td>- they are compliant with treatments; AND</td>
</tr>
<tr>
<td></td>
<td>- they show no evidence of end organ damage relevant to marine pilotage as specified elsewhere in the standard.</td>
</tr>
</tbody>
</table>
The Alcohol Use Disorders Identification Test (AUDIT) was developed by the World Health Organisation (WHO) as a simple method of screening for excessive alcohol consumption. It provides a framework for intervention to help risk or high-risk drinkers to reduce or cease their alcohol consumption. It also helps to identify alcohol dependence.

The AUDIT is included in the Health Questionnaire for Marine Pilots in order to help identify patterns of alcohol use that may impact on pilot health and on their conduct of their safety critical work. Identification of ‘harmful’ alcohol consumption as well as indicators of alcohol dependence is therefore particularly important.

The Periodic Health Assessment also provides an opportunity to counsel pilots about hazardous drinking patterns.

The AUDIT provides an accurate measure of risk across gender, age and cultures. Its validity, brevity and flexibility make it the most widely used screening instrument around the world.

The standard AUDIT has ten questions to which there is a choice of up to five answers in a tick-a-box format. The questions are designed to seek information in three domains as shown in Table 6.

### Table 6. Domains and item content of the AUDIT

<table>
<thead>
<tr>
<th>Domains</th>
<th>Question No.</th>
<th>Item content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risky or Hazardous Alcohol Use</td>
<td>1</td>
<td>Frequency of drinking</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Typical quantity</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Frequency of heavy drinking</td>
</tr>
<tr>
<td>Dependence Symptoms</td>
<td>4</td>
<td>Impaired control over drinking</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Increased salience of drinking</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Morning drinking</td>
</tr>
<tr>
<td>High-Risk or Harmful Alcohol Use</td>
<td>7</td>
<td>Guilt after drinking</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Blackouts</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Alcohol-related injuries</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Others concerned about drinking</td>
</tr>
</tbody>
</table>

### Definitions

**Risky or Hazardous Alcohol Use**
Hazardous drinking is a pattern of alcohol consumption that increases the risk of harmful consequences for the user or others, including the risk of accidents, injuries and social problems.

**High-Risk or Harmful Alcohol Use**
Harmful use refers to alcohol consumption that results in long term consequences to physical and mental health, e.g. gastritis, liver damage, depression etc.

**Alcohol Dependence**
Alcohol dependence is a cluster of behavioural, cognitive and physiological phenomena that may develop after repeated alcohol use. Typically these include a strong desire to consume alcohol, impaired control over use, persistent drinking despite harmful consequences, a higher priority given to drinking than to other activities and obligations, increased alcohol tolerance, and physical withdrawal reaction.

### USE OF THE AUDIT FOR MARINE PILOTS
The purpose of applying the AUDIT to safety critical pilots is to ensure that individuals are not impaired at work, either by the direct effects of alcohol or the health and/or social problems associated with alcohol use.

The examining health professional is required to evaluate the responses to the questionnaire in conjunction with results of the clinical examination, and form a view as to whether they believe there is a significant current risk that the pilot might be impaired at work, either by the direct effects of alcohol or by associated health or social problems.

Note that it is possible to accumulate eight or more points as a result of binge drinking on days off, or of excessive drinking in the past, without necessarily being at risk of being impaired at work. The health assessment does however provide a valuable opportunity to provide brief advice about risky alcohol consumption.

Note also that through separate drug and alcohol policies and procedures, safety critical workers may be subject to random testing by their operator. Marine pilots are also liable for testing following incidents, and may be prosecuted by the police if alcohol is detected while piloting.

### ADMINISTERING THE AUDIT
In the marine pilot health assessment, the AUDIT questionnaire is administered in a self-report format; however it can also be administered by interview if necessary. The cognitive capacities (e.g. literacy, forgetfulness) and the level of cooperation or defensiveness of the pilot should be considered in selecting the appropriate format.

Dishonest completion is believed to be an issue amongst pilots, so review of the responses with the pilot is desirable. It may be helpful to reassure the pilot that all responses are confidential and are not forwarded to the operator.

### SCORING THE AUDIT AND MANAGING SAFETY CRITICAL WORKERS
Each of the questions has a range of responses and each response has a score ranging from 0 to 4. Questions are scored for the response from left to right. A total score of 40 is possible.
AUDIT Questionnaire (cont)

Higher scores indicate a greater likelihood of hazardous or harmful drinking and reflect a greater severity of alcohol problems and dependence as well as a greater need for more intensive treatment.

AUDIT results are classified into particular risk levels, or zones to guide the appropriate intervention. Table 7 illustrates the general guidelines for World Health Organisation (WHO) assignment of risk levels based upon AUDIT scores, and describes the intervention appropriate to that level.

Table 7. AUDIT risk levels

<table>
<thead>
<tr>
<th>Risk Levels</th>
<th>Intervention</th>
<th>AUDIT Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone I</td>
<td>Alcohol education</td>
<td>0 - 7</td>
</tr>
<tr>
<td>Zone II</td>
<td>Simple advice</td>
<td>8 - 15</td>
</tr>
<tr>
<td>Zone III</td>
<td>Simple advice plus Brief Counselling, and Continued Monitoring</td>
<td>16 - 19</td>
</tr>
<tr>
<td>Zone IV</td>
<td>Refer for diagnostic evaluation and treatment</td>
<td>20 - 40</td>
</tr>
</tbody>
</table>

Risk Zone I — AUDIT scores between 0 and 7
This score generally indicates low-risk drinking. Although no formal intervention is required, alcohol education is appropriate for the following reasons:
- It contributes to the general awareness of alcohol risks and the relevance to safety critical work.
- It may be effective for pilots who have experienced alcohol problems but who have already reduced their drinking levels; or whose circumstances may change.
- It could be effective for those pilots who have minimised the extent of their drinking on the AUDIT questions.

Risk Zone II — AUDIT scores between 8 and 15
Scores in this zone are likely to be recorded by a significant proportion of pilots. They indicate alcohol use in excess of the low-risk guidelines.

Persons in Zone II generally would be drinking at risky or hazardous levels and would be at moderate risk of alcohol-related harm. This zone however may also include pilots experiencing actual harm and low levels of dependence. Generally, simple advice and information on the alcohol guidelines and risk factors, and the importance of attentiveness for safety critical work would be an appropriate intervention.

The examining health professional may assess the pilot as Fit Subject to Review in order to flag the issue for attention at subsequent assessments. The period of review may be earlier than or in line with normal periodic frequencies, depending on the clinical assessment and other indicators.

Risk Zone III — AUDIT scores between 16 and 19
This zone indicates risky drinking and problems related to higher levels of consumption. This score indicates a pattern of consumption that is already causing harm to the drinker who may also have symptoms of dependence. Pilots in this zone should be managed by a combination of simple advice, brief counselling, and continued monitoring. Follow-up and referral to the pilot's general practitioner is necessary.

The examining health professional should assess the pilot as Fit Subject to Review and should refer for external assessment via the pilot's general practitioner. They may also classify Temporarily Unfit, if there are immediate concerns for safe conduct of marine piloting tasks.

Risk Zone IV — AUDIT scores in excess of 20 and where combined scores on questions 4, 5 and 6 are equal or greater than 4
Scores in this zone indicate that the person falls into the high-risk category of alcohol-related harm. Pilots in this zone are likely to be alcohol dependent and require more intensive intervention. Health professionals should note that dependence varies along a continuum of severity and might be clinically significant at lower AUDIT scores.

Pilots in this zone should be referred to specialist services to consider withdrawal, pharmacotherapy and other more intensive treatments. They should be assessed as Temporarily Unfit for Duty pending further assessment and referred in the first instance to their general practitioner.

STEPS IN IDENTIFYING A DRINKING PROBLEM
If a person has a total score of 8 or more on the AUDIT questionnaire, the following additional steps are recommended:

1. Check the accuracy of the high scoring questions with the pilot.
2. Ask some additional questions to help determine the person’s potential for alcohol dependence. The following questions may be helpful to confirm accuracy and obtain more information:
   - How many drinks did you have on your last drinking day - and on the previous occasion? (this is a good guide to the usual intake).
   - Is there any time during the week when you regularly drink more than at other times (e.g. the weekend)? How much do you usually drink on these occasions? (This will indicate whether or not the person is a regular episodic-drinker).
   - Do you skip meals because of your drinking?
   - Do your hands shake in the morning after an evening’s drinking?
AUDIT Questionnaire (cont)

WHAT ELSE CAN THE AUDIT TELL US?

Additional information can be obtained from looking at the person’s answers to the individual questions. The questions can be divided into the following domains: consumption, dependence and life problems.

Consumption: Questions 1-3

These questions indicate the level of the person’s alcohol consumption. A combined score of 4 or more classifies drinking as risky or hazardous. Many people who are drinking at risky and high-risk levels will tend to have higher scores in the domains of Consumption and Life Problems and lower scores in the domain of Dependence.

These people may be more suitable for brief interventions, either by the examining health professional or via referral to the pilot’s general practitioner.

Dependence: Questions 4-6

A combined score of 4 or more on these questions indicates the emergence or existence of alcohol dependence. The score in this domain should be assessed in relation to the overall score. For example, a score of 4 or more would usually indicate that the overall score would be 20 or above and warrant further evaluation for alcohol dependence. This may mean referral or additional assessment for more intensive intervention via the pilot’s general practitioner.

Life Problems: Questions 7-10

These questions enquire about problems the person has experienced that are related to drinking. A combined score of 4 or more indicates the existence of problems and is defined as high-risk or harmful. There may be a clear indication that alcohol related harm has already been experienced. Some people may give evidence of a past problem (i.e. ‘Yes, but not in the last year’) and even if their drinking is not currently hazardous, it may indicate the need for reinforcing safe drinking and continued vigilance.

References

2. BALANCE AND VESTIBULAR DISORDERS

2.1 RELEVANCE TO MARINE PILOTS

Pilots need to embark and disembark ships using the pilot’s ladder as detailed in the Inherent Requirements (page 27). The ladder is up to 9 meters long and requires a vertical ascent or descent often in adverse weather conditions.

Pilots require a good sense of balance for climbing the pilot’s ladder as well as working on rolling ships. Disorders of balance or dizziness (vertigo) may affect the ability to undertake pilotage work.

Balance may be affected by disorders of the peripheral sense organs including the vestibular apparatus, proprioception or vision, as well as central disorders including those of the cerebellum and extra-pyramidal system. Loss of balance or dizziness may also arise from cardiac, endocrine and psychological causes. Vestibular disorders are of particular relevance and are discussed here. The relevant chapters should be referred to for other conditions.

A fear of heights is not consistent with working on the pilot’s ladder. However pilots are recruited from experienced mariners who have experience of such ladders and have self selected to the job. Therefore assessing for fear of heights is usually not a medical issue.

2.2 ASSESSMENT AND MEDICAL CRITERIA

Generally, those who suffer from unheralded attacks of dizziness (vertigo) are not fit for marine piloting.

Balance should be clinically assessed by using a simple Romberg test. A pass requires the ability to maintain balance while standing with shoes off, feet together side-by-side, eyes closed and arms by sides, for thirty seconds. The opinion of an appropriate specialist may be sought and additional assessments of balance may be conducted as needed by an occupational therapist or physiotherapist.

When a lack of balance or dizziness (vertigo) is found the relevant chapters should be referred to. Episodes of dizziness or disturbances of balance without a clear diagnosis should be managed as for undifferentiated illness and the person classed temporarily unfit (refer to page 44).

Vestibular disorders are of particular relevance and are discussed here.

Vestibular disorders may vary between symptomatic and asymptomatic with little warning. Vestibular malfunction can occur suddenly and with sufficient severity to make safe marine piloting impossible. It is often accompanied by nystagmus, which compounds the disability.

2.2.1 Acute labyrinthitis and neurolabyrinthitis

Subsequent to an initial attack of vertigo due to acute labyrinthitis (deafness and vertigo), there may be further recurrence of vertigo for up to twelve months. Given that there are no peremptory symptoms, a sudden inability to work safely may eventuate. The person should not pilot ships while symptoms persist.

In cases of acute neurolabyrinthitis (syn. vestibular neuronitis, viral infection of the vestibular nerve) which causes nystagmus and vertigo, recurrence of symptoms can present for many years despite treatment. This makes it quite difficult to isolate a given phase of the condition where symptoms deleterious to an individual’s fitness for duty may be present.

2.2.2 Meniere’s disease

In confirmed Meniere’s disease, vestibular malfunction and nystagmus can occur despite treatment. The natural history is of progression in the affected ear associated with increasing hearing loss until in the extreme total loss of vestibular function and partial loss of cochlear function occurs in the affected ear. It is usually incompatible with piloting work.

2.2.3 Benign paroxysmal positional vertigo (BPPV)

Generally patients with BPPV will not have symptoms in the upright position. However, pilots with BPPV and symptoms in the upright position should not perform piloting duties such as climbing ladders while symptoms persist and should be free of symptoms and signs for two months before resuming such duties.

2.2.4 Post-traumatic vertigo

Post-traumatic vertigo can arise from falls, car crashes, etc and have multiple causes due to injury to the middle and inner ear. Surgical and medical treatments may be helpful. Individual assessment of balancing skills is needed regarding return to work.

2.2.5 Medications

Medication for dizziness (vertigo) may include drugs such as promethazine which may have sedating properties and so adversely affect ability to pilot safely.

Medical criteria for fitness for duty are outlined in the following table.

There is no specific advice on assessing this side-effect but desirably a pilot would begin any necessary course on days off and be assessed for alertness prior to working.
MEDICAL CRITERIA FOR MARINE PILOTS—MUSCULOSKELETAL DISORDERS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vestibular Function</td>
<td>The criteria for <em>Fit for Duty</em> are not met:</td>
</tr>
<tr>
<td></td>
<td>• if the person has, or has had in the previous twelve months, any condition of recurrent vertigo. This includes confirmed Meniere's disease, recurrent unheralded vertigo and/or benign paroxysmal positional vertigo, with or without treatment, or any other type of vertigo.</td>
</tr>
<tr>
<td></td>
<td><em>Fit for Duty Subject to Review</em> may be recommended, taking into account the opinion of an ENT specialist and the nature of the work:</td>
</tr>
<tr>
<td></td>
<td>• for persons who have had vertigo caused by recurring unheralded attacks of vertigo, after at least twelve months free of vertigo;</td>
</tr>
<tr>
<td></td>
<td>• for persons who have had one episode of vertigo caused by acute labyrinthitis (deafness and vertigo), acute neurolabyrinthitis (vestibular neuronitis), after at least six months free of vertigo;</td>
</tr>
<tr>
<td></td>
<td>• for persons who have any other type of vertigo, after at least two months free of vertigo;</td>
</tr>
<tr>
<td></td>
<td>• for persons who have had BPPV only, after at least two months free of symptoms and signs of BPPV.</td>
</tr>
<tr>
<td></td>
<td>The ENT specialist is to have regard to:</td>
</tr>
<tr>
<td></td>
<td>• the nature of the condition and response to treatment; and</td>
</tr>
<tr>
<td></td>
<td>• the ability to climb the pilot's ladder.</td>
</tr>
</tbody>
</table>

References

3. CANCER

3.1 RELEVANCE TO MARINE PILOTS

Cancer may affect the ability to undertake pilotage work. The site and degree of advancement of the cancer are prime considerations because the cancer may affect various body functions. This is particularly important for benign or malignant intracranial tumours.

Treatment with opioids, chemotherapy or radiotherapy may present side effects, which interfere with an individual’s functional capacity and thus may be incompatible with the performance of marine piloting duties. Fatigue will be a significant issue regarding climbing the pilot’s ladder.

The outdoor work of pilots disposes them to certain types of skin cancer. These cancers may be found fortuitously at an examination. The patient should be informed and referred to their general practitioner for further management. Education may be given regarding prevention or early detection of further skin cancers.

3.2 ASSESSMENT AND MEDICAL CRITERIA

Cases should be assessed on an individual basis regarding the site of the cancer, the response to chemotherapy and radiotherapy and any side effects. This will also involve assessing the patient’s overall functional capacity and considering the effects of medication.

If the tumour involves the brain, the patient should not undertake pilotage work, subject to a comprehensive health assessment. Disturbance of the sense of balance should be assessed carefully regarding risks on climbing the pilot’s ladder.

Neuropsychological assessment may be helpful and computer or scale model simulations of pilotage may also aid assessment (refer to page 18).

Medical criteria for fitness for duty are outlined in the following table.

### MEDICAL CRITERIA FOR MARINE PILOTS—CANCER

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
</table>
| Cancer    | The effects at the primary site or of metastases are mainly covered by criteria given elsewhere in the standard. When in doubt, the impact of the cancer on the necessary health attributes to do pilotage work (Part B, page 27) should determine the classification regarding fitness for duty.  
**Fit for Duty Subject to Review** may be recommended, taking into account the opinion of an appropriate specialist, the type of cancer and the likely effects of any ongoing chemotherapy (e.g. opioids) on work capacity. |
| Intracranial tumours | The criteria for **Fit for Duty** are not met:  
- if the person has evidence of primary or secondary cancer within the brain.  
**Fit for Duty Subject to Review** may be recommended, taking into account the opinion of an appropriate specialist and the nature of the work:  
- three months after successful treatment of the tumour;  
- if the persons physical and mental abilities are likely to remain relatively stable as judged by the treating specialist; AND  
- there are no likely effects on balance and coordination on the pilot’s ladder.  
Neuropsychologist assessment or assessment with a simulator may be helpful (refer to page 18). |
4. CARDIOVASCULAR FITNESS AND DISEASES

4.1 RELEVANCE TO MARINE PILOTS

Cardiorespiratory fitness of a high order is required for pilotage work. This is particularly in relation to climbing the pilot’s ladder and climbing up 6-7 flights of stairs to reach the bridge. It is important the pilot is in good physical condition on reaching the bridge and not exhausted because the subsequent work involves high mental demands.

Collapse or loss of concentration due to other cardiovascular symptoms such as palpitations may jeopardise control of the ship at critical times. However, should collapse occur, others on the bridge may take appropriate action to mitigate the consequences, possibly in conjunction with tugs and harbour control.

There are a few epidemiological studies of the health of pilots which have mainly found average or low cardiovascular mortality indicating this is not a high-risk group\(^1\).

Effects of Marine Piloting on the Heart: A further problem in those who have established ischaemic heart disease is that safety critical work such as marine piloting causes occasional emotional and sensorimotor arousal leading to a faster heart rate and fluctuation in blood pressure. Such pilots may need to respond to emergency, which theoretically could trigger angina, or even infarction.

Pilots work in environments with electromagnetic fields. For example they extensively use hand held VHF radios with a power of up to SW, and are sometimes in close proximity to the deck with antennae (‘monkey island’). These fields may cause interference with medical devices such as cardiac pacemakers. This is discussed further in the following pages.

4.2 ASSESSMENT AND MEDICAL CRITERIA

Presymptomatic heart disease as well as asymptomatic disease needs to be identified. This is made possible through the use of screening tests beginning with the Cardiac Risk Score as well as VO\(_2\) max testing and clinical examination (see below).

A marine pilot, who is asymptomatic but found to have an increased likelihood of a heart attack on a Cardiac Risk Score, should be assessed more fully than an ordinary patient because of the risks they pose to public safety.

Cardiovascular disease also may have end organ effects such as on the brain (stroke), vasculature of the extremities and vision. The relevant chapters should be referred to for advice on assessment of these effects.

Medical criteria for fitness for duty are outlined in the tables commencing on page 67.

Standards for chronic disorders are made with the presumption that the disorder is stable and well controlled. If this is not the case, a specialist consultation should be conducted. Fitness for Duty Subject to Review may be recommended after initial assessment by an appropriate specialist.

4.2.1 Cardiac Risk Assessment

Assessment of cardiac risk involves clinical assessment as well as use of the Cardiac Risk Score. Clinical assessment includes the evaluation of information such as:

- symptoms, such as undetermined chest pain;
- family history, such as first degree relatives having cardiovascular events in mid-life;
- past history;
- co-morbidity such as obesity (BMI \(\geq 30\), refer to page 88), inactivity, obstructive sleep apnoea, depression etc;
- work factors such as demands of climbing pilots’ ladders, exposure to climatic extremes in course of work, etc.

All information should be used in assessing fitness. Clinical judgement may be needed to determine if a person is Fit for Duty, Fit for Duty Subject to Review, or Temporarily Unfit for Duty while being further investigated.

4.2.2 Cardiac Risk Score

The health assessment incorporates the Cardiac Risk Score as a tool for predicting risk of a cardiovascular event, and in particular heart attack, over 5 years. It considerably enhances the power of the assessment to identify pilots at risk of sudden incapacity and to guide their management.

The Cardiac Risk Score is based on data from the American Heart Association (Heart to Heart www.med-decisions.com) and has been developed by Civil Aviation Safety Authority (CASA). The score has been adapted to reflect the risks of the marine environment.

The Heart to Heart web site provides a calculator for the score and also shows the reduction in score to be obtained if risk factors are successfully modified. This can assist in pilot education.

The Cardiac Risk Score is utilised as follows:

1. Data Collection

Obtain the information for the Cardiac Risk Score calculator as follows:

- age and sex;
- cigarette smoking;
- blood pressure as measured supine;
- ECG - report specifically requiring information regarding presence of left ventricular hypertrophy\(^4\);

---

\(^4\) Left Ventricular Hypertrophy (LVH)

The Sokolow-Lyon criterion for LVH is met if the amplitude of the S wave in V1 added to the amplitude of the R wave in V5 is greater than 35mm. There are other considerations, with LVH...
Part C. Medical Criteria for Marine Pilot Health Assessments

- fasting blood for Total and HDL cholesterol; and
- fasting plasma glucose. A level over 7mmol/L is ‘diabetic’ for calculations. Patients with values 5.5-6.9mmol/L should be referred to their general practitioner for further assessment.

2. Calculation
Calculate the score using Table 8: Coronary Heart Disease Risk Factor Prediction Chart.

3. Stratification and Risk Management
The Cardiac Risk Score is associated with a probability of a cardiovascular event in the next 5-10 years. The higher the score, the higher the probability. Therefore management of pilots is determined partly by their risk score and partly by their overall cardiac risk assessment. The pilots risk threshold is set at 2% pa over 5yr since there are other people on the bridge who may take over or summon help.

- Score \( \geq 32 \) (probability \( \geq 25\% \) in 5 years). Pilot is unfit for marine piloting. They should be referred for stress ECG and classed Temporarily Unfit for Duty pending results and appropriate management.

- Score 22-31 (probability 11-24% in 5 years). Pilot is referred for stress ECG. While awaiting results of ECG the pilot may be assessed as Fit for Duty Subject to Review or Temporarily Unfit for Duty depending on overall cardiac risk assessment.

- Score 15-21 (probability 5-9% in 5 years). Pilot is assessed for specific risk factors and overall cardiac risk, including obesity.

- Score <15 (probability <5% in 5 years). Pilot assessed regarding overall cardiac risk assessment and managed accordingly including referral to general practitioner as required. They may be classed Fit for Duty or Fit for Duty Subject to Review depending on overall assessment.

Risk Factors
Where risk factors are identified (e.g. raised blood pressure, smoker etc), the pilot should be referred to their general practitioner and other appropriate programs. The pilot should be reviewed annually to monitor management of their risk factor profile. Where hypertension is identified as a risk factor, refer to the section on hypertension.

Stress ECG
The stress ECG should be conducted using the Bruce protocol. The exercise capacity should be \( \geq 90\% \) of the age/sex predicted capacity (Bruce et al 1973).

Where stress ECG is positive or clinical assessment warrants it, referral to a cardiologist should be made for further assessment and advice on management.
Diagram 9. Management of Cardiac Risk Score

Calculate Cardiac Risk Score (CRS) and consider overall risk assessment (e.g. family history)

- If CRS ≥ 32
  - Assess Temporarily Unfit for Duty

- If CRS 22 – 31
  - Refer for stress ECG
  - Assess Temporarily Unfit or Fit Subject to Review depending on clinical picture

- If CRS 15 – 21
  - Does overall risk assessment warrant ECG?
    - YES
      - Refer to cardiologist
      - Manage as appropriate
    - NO
      - Fit Subject to Review or Temp Unfit for Duty

- If CRS < 15
  - Do risk factors require modification?
    - YES
      - Refer to general practitioner for management
      - Recommend annual review period
    - NO
      - Review as per scheduled Periodic Health Assessment

Temporarily Unfit for Duty

Positive

Negative
Table 8.  Coronary heart disease risk factor prediction chart  
(Civil Aviation Safety Authority)

<table>
<thead>
<tr>
<th>Age</th>
<th>Points</th>
<th>Age</th>
<th>Points</th>
<th>Age</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>-12</td>
<td>30</td>
<td>-2</td>
<td>57-59</td>
<td>13</td>
</tr>
<tr>
<td>31</td>
<td>-11</td>
<td>31</td>
<td>-1</td>
<td>60-61</td>
<td>14</td>
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<tr>
<td>32</td>
<td>-9</td>
<td>32-33</td>
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<td>62-64</td>
<td>15</td>
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<tr>
<td>34</td>
<td>-6</td>
<td>35-36</td>
<td>2</td>
<td>68-70</td>
<td>17</td>
</tr>
<tr>
<td>35</td>
<td>-5</td>
<td>37-38</td>
<td>3</td>
<td>71-73</td>
<td>18</td>
</tr>
<tr>
<td>36</td>
<td>-4</td>
<td>39</td>
<td>4</td>
<td>74</td>
<td>19</td>
</tr>
<tr>
<td>37</td>
<td>-3</td>
<td>40-41</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>-2</td>
<td>42-43</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
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<td>44-45</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>0</td>
<td>46-47</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>1</td>
<td>48-49</td>
<td>9</td>
<td></td>
<td></td>
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<td>50-51</td>
<td>10</td>
<td></td>
<td></td>
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<td>44</td>
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<td>52-54</td>
<td>11</td>
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<td></td>
</tr>
<tr>
<td>45-46</td>
<td>4</td>
<td>55-56</td>
<td>12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**1. Find Points For Each Risk Factor**

- **Age (if Female)**: Points for each age group.
- **Age (if Male)**: Points for each age group.
- **HDL-Cholesterol**: Points for each HDL cholesterol level.
- **Total-Cholesterol**: Points for each total cholesterol level.
- **Systolic Blood Pressure**: Points for each systolic blood pressure level.
- **Other**: Points for each other factor.

**2. Sum Points For All Risk Factors**

<table>
<thead>
<tr>
<th>Age</th>
<th>Points</th>
<th>Age</th>
<th>Points</th>
<th>Age</th>
<th>Points</th>
<th>Age</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>-12</td>
<td>30</td>
<td>-2</td>
<td>57-59</td>
<td>13</td>
<td>0.65-0.68</td>
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<td>31</td>
<td>-1</td>
<td>60-61</td>
<td>14</td>
<td>0.69-0.76</td>
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<tr>
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<td>-9</td>
<td>32-33</td>
<td>0</td>
<td>62-64</td>
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<td>0.77-0.84</td>
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<td>1</td>
<td>65-67</td>
<td>16</td>
<td>0.85-0.90</td>
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</tr>
<tr>
<td>34</td>
<td>-6</td>
<td>35-36</td>
<td>2</td>
<td>68-70</td>
<td>17</td>
<td>0.91-0.99</td>
<td>3</td>
</tr>
<tr>
<td>35</td>
<td>-5</td>
<td>37-38</td>
<td>3</td>
<td>71-73</td>
<td>18</td>
<td>1.00-1.09</td>
<td>2</td>
</tr>
<tr>
<td>36</td>
<td>-4</td>
<td>39</td>
<td>4</td>
<td>74</td>
<td>19</td>
<td>1.10-1.19</td>
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<td>-3</td>
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<td></td>
<td>1.20-1.30</td>
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<td></td>
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<td>1</td>
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<td>-1</td>
<td>44-45</td>
<td>7</td>
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<td></td>
<td>1.44-1.56</td>
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<td>46-47</td>
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<td></td>
<td>1.57-1.70</td>
<td>1</td>
</tr>
<tr>
<td>41</td>
<td>1</td>
<td>48-49</td>
<td>9</td>
<td></td>
<td></td>
<td>1.71-1.89</td>
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<td>50-51</td>
<td>10</td>
<td></td>
<td></td>
<td>1.90-2.07</td>
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<td>44</td>
<td>3</td>
<td>52-54</td>
<td>11</td>
<td></td>
<td></td>
<td>2.08-2.25</td>
<td>1</td>
</tr>
<tr>
<td>45-46</td>
<td>4</td>
<td>55-56</td>
<td>12</td>
<td></td>
<td></td>
<td>2.26-2.49</td>
<td>1</td>
</tr>
</tbody>
</table>

**3. Look up risk corresponding to point total**

<table>
<thead>
<tr>
<th>Probability (%)</th>
<th>Probability (%)</th>
<th>Probability (%)</th>
<th>Probability (%)</th>
</tr>
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<tbody>
<tr>
<td>Pts 5Yr.</td>
<td>10Yr. Pts</td>
<td>5Yr.</td>
<td>10Yr. Pts</td>
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<tr>
<td>&lt; 1</td>
<td>&lt;1</td>
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<td>2</td>
</tr>
<tr>
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<td>1</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
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<td>1</td>
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<td>3</td>
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</tr>
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<td>3</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>5</td>
<td>18</td>
</tr>
</tbody>
</table>

**4. Compare to Average 10 Year Risk**

- **Probability (%)**
- **Age**
- **Women**
- **Men**

Modified from Chart by The American Heart Association, April 2002
4.2.3 Cardiorespiratory fitness (VO2 max)
Cardiorespiratory fitness of a high degree is required for pilotage work particularly regarding climbing the pilot’s ladder and up to six storeys of stairs to reach the bridge. It is important the pilot is in good physical condition on reaching the bridge and not exhausted because the subsequent work involves high mental demands.

Cardiorespiratory fitness may be assessed by measuring maximal oxygen uptake (VO2 max). This is an estimate of the capacity to transport and utilize oxygen during incremental exercise. It is usually expressed in millilitres of oxygen per kilogram of bodyweight per minute (ml/kg/min).

**VO2 Max Tests**
VO2 may be indirectly measured using various tests including the step test (preferred as similar to ladder and stairs), bicycle ergometer or treadmill. A protocol for the step test is shown below with a calculator (Table 9). Direct measurement is the definitive test.

A routine haemoglobin test should also be conducted because of the high oxygen demands. The blood is taken at time of fasting blood for Cardiac Risk Score.

**YMCA Step test procedure**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>To assess aerobic fitness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equipment</strong></td>
<td>Step 12 inches high (= 30cm = step width on pilots ladder), stopwatch and chair.</td>
</tr>
<tr>
<td><strong>Procedure</strong></td>
<td>The tester makes sure he/she can find a pulse on the client either at the wrist (two fingers below the thumb) or next to the throat. The tester is to ensure all steps are stable and correctly prepared. The client makes one leg movement for each beat of the metronome, i.e., right foot up onto the step on 1, left foot up on 2, right foot down on the floor on 3 and left foot down on 4. The subject is required to climb and descend the step 24 times in one minute. It is usually necessary for the tester to guide the subject verbally ‘step up, up, step down, down’. The test requires the subject to step for 3 minutes. At the end of the 3 minutes the subject immediately sits down and the tester counts the pulse for 1 full minute. The counting must start within 5 seconds of cessation of stepping. The test score is recorded in beats per minute (bpm).</td>
</tr>
</tbody>
</table>

**Table 9. Step test**
To calculate VO2 max, enter heart rate score in the table below.

<table>
<thead>
<tr>
<th>Heart Rate (bpm)</th>
<th>VO2max (ml/kg/min) Men</th>
<th>VO2max (ml/kg/min) Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>60.9</td>
<td>43.6</td>
</tr>
<tr>
<td>31</td>
<td>59.3</td>
<td>42.9</td>
</tr>
<tr>
<td>32</td>
<td>57.6</td>
<td>42.2</td>
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<tr>
<td>33</td>
<td>55.9</td>
<td>41.4</td>
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<td>34</td>
<td>54.2</td>
<td>40.7</td>
</tr>
<tr>
<td>35</td>
<td>52.5</td>
<td>40.0</td>
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<tr>
<td>36</td>
<td>50.9</td>
<td>39.2</td>
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<td>29.6</td>
</tr>
<tr>
<td>50</td>
<td>27.3</td>
<td>28.9</td>
</tr>
</tbody>
</table>

**Medical Criteria**
A nomogram for is also shown in Table 10. Studies on pilots indicate they have high levels of fitness, probably from routinely doing this demanding physical work.

- **Recruitment.** At recruitment they should be in the ‘above average’ or better range.
- **Periodic examinations.** The trend for should be noted at each examination allowing for a trend with age. If there is an untoward trend, the reasons for this should be discussed and investigated as appropriate, in conjunction with the general practitioner. If the decreases to the ‘average’ range the pilot should be classified Temporarily Unfit until the cause is determined and fitness satisfactorily recovered.
- **Haemoglobin should be within normal values.**
Diagram 10. Male VO$_2$ max norms

Diagram 11. Female VO$_2$ max norms
4.2.4 Other Cardiovascular Conditions

**Suspected Angina Pectoris:** Where chest pains of uncertain origin are reported, every attempt should be made to reach a positive diagnosis and the pilot counselled in the meantime to restrict marine piloting duties. Generally it would be wise to classify the person as Temporarily Unfit for Duty until investigations exclude heart disease. If the tests are positive or the person remains symptomatic and requires anti-angina medication for the control of symptoms, the criteria listed for proven angina pectoris apply.

**Cardiac surgery** may be performed for various reasons including valve replacement, excision of atrial myxoma or correction of septal defects. In some cases this is curative of the underlying disorder. Refer to Table 10 on Non-working Periods. In other cases the condition may not be stabilised and hence needs to be individually assessed. All cardiac surgery patients should be advised regarding returning to piloting work in the short-term as for any other post-surgery patient and may be classed as Temporarily Unfit for Duty. After thoracotomy an assessment will need to be made of the strength of the pilot's arms and their ability to resume climbing pilot's ladders safely.

**Deep venous thrombosis (DVT)** may occur in association with surgery or from clotting disorders. A risk to marine pilots occurs if a pulmonary embolus arises. DVT need to be assessed with regard to the likelihood of recurrence over a long period to gauge the impact on fitness for duty. A DVT arising in the course of surgery is unlikely to have impact on fitness for duty because it is self-limiting. Treatment often involves anti-coagulants and this section in the standard should also be referred to.

**Anti-coagulant therapy** may be used for disorders of cardiac rhythm, following valve replacement or for deep venous thrombosis to lessen the risk of emboli. However, if not adequately controlled there is a risk of bleeding which, in the case of an intracranial bleed may acutely affect marine piloting. Such pilots may only work if well controlled and subject to review.

**Hypertension** is associated with increased risk of heart attack and stroke, which is particularly important in safety critical workers such as marine pilots. Assessment of pilots with high blood pressure should include end organ damage relevant to safe working, the presence of other risk factors, which increase the likelihood of cardiovascular event, and the possibility that treatment may cause hypotension.

Hypertension presents as a spectrum of blood pressures with the highest posing the greatest risk and therefore a graded response is appropriate (refer also to Diagram 12 overleaf).

- Pilots found to have blood pressure (treated or untreated) consistently greater then 200/110 pose an unacceptable risk and should be classed Temporarily Unfit for Duty and referred for treatment.
- Pilots with blood pressure less than 200/110 but greater than 150/95 (treated or untreated) may be classed as Fit for Duty Subject to Review. They should be referred to their general practitioner and treated so as to obtain a level of less than 150/95 within 9 months, with 3 monthly reviews. (The review need not be by a cardiologist). If this is not achieved they should be classified Unfit for Duty. Aggressive treatment may require attention as appropriate, to compliance, weight-loss, decreased alcohol, regular exercise, decrease salt intake, etc.
- Blood pressure less than 150/95 is acceptable but further reduction is to be encouraged and referred to their general practitioner. The pilot should be classed Fit for Duty Subject to Review.
- Blood pressure less than 140/90 is ideal. Pilots who obtain this level only on treatment should be classed Fit for Duty Subject to Review. Pilots who are untreated and have this blood pressure should be classed Fit for Duty.

Where causative factors of hypertension have been identified and cured the pilot should initially be classed Fit for Duty Subject to Review but after adequate follow-up shows blood pressure is normal may be exempted from review.

**Non-Work Periods:** A number of cardiovascular incidents and procedures may impact on short-term and long-term fitness for duty, for example, AMI or aneurysm repair. Such situations present an obvious risk. The pilot should be classed as Temporarily Unfit for Duty and should not undertake piloting duties for the appropriate period, as laid out in Table 10. The recommendations regarding fitness for duty should be considered once the condition has stabilised and work capacity can be assessed (including VO2 max) per the criteria outlined in this chapter.

**Electro-magnetic interference (EMI):** Pilots work in environments with electromagnetic fields. For example they extensively use hand held VHF radios with a power of up to 5W, and are sometimes in close proximity to 'monkey island'. These fields may cause interference with medical devices such as cardiac pacemakers. Pacemakers are usually implanted under the clavicle (collarbone) and hence are close to the hand-held radios. A major manufacturer of pacemakers (Medtronic) advises avoidance of interference by maintaining a distance of 6 inches /15 cm for radio sources of 3 W or less, and a distance of 12 inches (30 cm) for sources of 3- 15W. Therefore use of a hand-held radio may cause interference with the pacemaker. In the event of a pacemaker being prescribed this will need careful discussion with the manufacturer and cardiologist regarding the risks of interference and the consequences should it occur, noting that most pacemakers are 'fail-safe' and hand-held radios are not used when on the ladder.
### Table 10. Minimum non-working periods post cardiovascular events or procedures

<table>
<thead>
<tr>
<th>Event / Procedure</th>
<th>Minimum non-working period for Marine Pilots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute myocardial infarction</td>
<td>3 months</td>
</tr>
<tr>
<td>Aneurysm repair</td>
<td>3 months</td>
</tr>
<tr>
<td>Angioplasty</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Cardiac arrest</td>
<td>As determined by treating specialist</td>
</tr>
<tr>
<td>Cardiac defibrillator</td>
<td>N/A</td>
</tr>
<tr>
<td>Cardiac pacemaker insertion</td>
<td>1 month</td>
</tr>
<tr>
<td>Coronary artery by-pass grafts</td>
<td>3 months</td>
</tr>
<tr>
<td>Deep vein thrombosis</td>
<td>As determined by treating specialist</td>
</tr>
<tr>
<td>Heart/ lung transplant</td>
<td>3 months</td>
</tr>
<tr>
<td>Pulmonary embolism</td>
<td>As determined by treating specialist</td>
</tr>
<tr>
<td>Syncope</td>
<td>3 months</td>
</tr>
</tbody>
</table>
Diagram 12. Management of blood pressure

Measure Resting Blood Pressure
(Separately raised systolic or diastolic or both is a risk)

- <140 / <90
  - Untreated
  - Treated
  - Fit for Duty

- 140-150 / 90-95
  - Treated or untreated
  - Fit Subject to Review
  - Period of review determined by the examining health professional
  - Refer to general practitioner for treatment / treatment review as required

- 150-200 / 95-110
  - Treated or untreated
  - Fit Subject to Review
  - Refer for treatment / review 3 monthly
  - At 9 months is blood pressure <150 / <95?
    - Yes
      - Period of review determined by the examining health professional
      - Refer to general practitioner for treatment / treatment review as required
    - No
      - Temporarily Unfit for Duty
      - Refer for treatment / assess if stable over 4/52

- >200 / >110
  - Treated or untreated
  - Temporarily Unfit for Duty
  - Refer for treatment / assess if stable over 4/52
  - Is blood pressure <200 / <110?
    - Yes
      - Period of review determined by the examining health professional
      - Refer to general practitioner for treatment / treatment review as required
    - No
      - Permanently Unfit for Duty
### Medical Criteria for Marine Pilots– Cardiovascular Diseases

<table>
<thead>
<tr>
<th>Condition</th>
<th>Criteria</th>
</tr>
</thead>
</table>
| **Acute Myocardial Infarct**<br>See also Angioplasty<br>See also Coronary Artery Bypass Grafting (CABG)** | The person should not perform pilotage work for **at least three months** after an AMI. The criteria for **Fit for Duty** are not met:  
- if the person has had an acute myocardial infarction. **Fit for Duty Subject to Review** may be recommended, taking into account the opinion of a cardiologist and the nature of the work:  
  - at least 3 months after an uncomplicated AMI;  
  - if the clinical history is one of minimal symptoms; AND  
  - if a Bruce Treadmill Test (or equivalent protocol) is $\geq 90\%$ of the age/sex predicted exercise capacity; and the VO$_2$ max is in the ‘above average’ range for age; and thallium or sestamibi scan show no evidence of myocardial ischaemia.  
  - if myocardial ischaemia is demonstrated, a coronary angiogram may be offered. If that shows lumen diameter reduction of less than 70% in a major coronary branch, and less than 50% in the left main coronary artery, the person may perform piloting work, subject to annual review.  
  - if the result of the angiogram shows a lumen diameter reduction of equal to or greater than 70% in a major coronary branch and less than 50% in the left main coronary artery (or if an angiogram is not conducted), **Fit for Duty Subject to Review** may be recommended:  
    1. if the clinical history is one of minimal symptoms; and  
    2. there is an exercise tolerance of $\geq 90\%$ of the age/sex predicted exercise capacity on the Bruce Treadmill Test (or equivalent protocol); and  
    3. there is no evidence of severe ischaemia, that is, less than 2mm ST segment depression on an exercise ECG and absence of a large defect on a stress perfusion scan; and  
    4. there is an ejection fraction of 40% or over.  
  The presence of other risk factors should also be considered. |
| **Aneurysms**<br>Abdominal and Thoracic | The person should not perform piloting work for at least three months post repair. The criteria for **Fit for Duty** are not met:  
- if the person has aortic aneurysm, thoracic or abdominal. **Fit for Duty Subject to Review** may be recommended after a non-working period of three months, taking into account the opinion of a cardiologist and the nature of the work:  
  - if the condition is minor; OR  
  - if the condition has been adequately treated; AND  
  - the VO$_2$ max is in the ‘above average’ range for age. |
### MEDICAL CRITERIA FOR MARINE PILOTS— CARDIOVASCULAR DISEASES (CONT)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
</table>
| **Angina**      | The criteria for *Fit for Duty* are not met:  
  - if the person is subject to angina pectoris.  
  *Fit for Duty Subject to Review* may be recommended, taking into account the opinion of a cardiologist and the nature of the work, in the following circumstances:  
    1. If a Bruce Treadmill Test (or equivalent protocol) is ≥90% of the age/sex predicted exercise capacity; and the VO2 max is in the ‘above average’ range for age; and thallium or sestamibi scan show no evidence of myocardial ischaemia.  
    2. If myocardial ischaemia is demonstrated, a coronary angiogram may be offered. If that shows lumen diameter reduction of less than 70% in a major coronary branch; and less than 50% in the left main coronary artery, the person may perform piloting work, subject to annual review.  
    3. If the result of the angiogram shows a lumen diameter reduction of equal to or greater than 70% in a major coronary branch and less than 50% in the left main coronary artery (or if an angiogram is not conducted), *Fit for Duty Subject to Review* may be recommended:  
      - if the clinical history is one of minimal symptoms; and  
      - there is an exercise tolerance of ≥90% of the age/sex predicted exercise capacity on the Bruce Treadmill Test (or equivalent protocol); and  
      - there is no evidence of severe ischaemia, that is, less than 2mm ST segment depression on an exercise ECG and absence of a large defect on a stress perfusion scan; and  
      - there is an ejection fraction of 40% or over.  
  The presence of other risk factors should also be considered. Where surgery or angioplasty is undertaken to relieve the angina, the criteria listed in the table below apply. |
| **Angioplasty** | The person should not perform pilotage work for **at least four weeks** after the angioplasty.  
  The criteria for *Fit for Duty* are not met:  
  - if the person has had coronary angioplasty.  
  *Fit for Duty Subject to Review* may be recommended, taking into account the opinion of a cardiologist and the nature of the work:  
    - at least 4 weeks after the angioplasty;  
    - if the clinical history is one of minimal symptoms; AND  
    - there is an exercise tolerance of ≥90% of the age/sex predicted exercise capacity on the Bruce Treadmill Test (or equivalent protocol) and the VO2 max is in the ‘above average’ range for age; AND  
    - there is no evidence of severe ischaemia, that is, less than 2mm ST segment depression on an exercise ECG and absence of a large defect on a stress perfusion scan; AND  
    - there is an ejection fraction of 40% or over. |
| **Anti-coagulant therapy** | The criteria for *Fit for Duty* are not met:  
  - if the person is on anti-coagulant therapy.  
  *Fit for Duty Subject to Review* may be recommended, taking into account the opinion of a cardiologist or haematologist and the nature of the work:  
    - if the therapy is satisfactory. |
### MEDICAL CRITERIA FOR MARINE PILOTS– CARDIOVASCULAR DISEASES (CONT)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Arrhythmia</strong></td>
<td>The criteria for <em>Fit for Duty</em> are not met:</td>
</tr>
<tr>
<td></td>
<td>- if the person has a history of recurrent or persistent arrhythmia, which may result in syncope or incapacitating symptoms.</td>
</tr>
<tr>
<td><strong>Fit for Duty Subject to Review</strong></td>
<td>may be recommended, taking into account the opinion of a cardiologist, and the nature of the work:</td>
</tr>
<tr>
<td></td>
<td>- if the condition has been cured surgically (for example, Wolff-Parkinson White syndrome); OR</td>
</tr>
<tr>
<td></td>
<td>- if the condition has been successfully treated medically for at least three months; AND</td>
</tr>
<tr>
<td></td>
<td>- the VO₂ max is in the ‘above average’ range for age.</td>
</tr>
<tr>
<td></td>
<td>If the person is taking anti-coagulants refer to anti-coagulants therapy above.</td>
</tr>
<tr>
<td><strong>Cardiac Arrest</strong></td>
<td>The non-working period following a cardiac arrest should be determined by the treating specialist. The criteria for <em>Fit for Duty</em> are not met:</td>
</tr>
<tr>
<td></td>
<td>- if the person has suffered a cardiac arrest.</td>
</tr>
<tr>
<td><strong>Fit for Duty Subject to Review</strong></td>
<td>may be recommended, taking into account the opinion of a cardiologist and the nature of the work, following an appropriate non-working period, and depending on the cause of the cardiac arrest and response to treatment and the VO₂ max is in the ‘above average’ range for age.</td>
</tr>
<tr>
<td><strong>Cardiac Risk Score</strong></td>
<td>The cardiac risk score is to be interpreted in the context of overall cardiovascular risk assessment. For details of management refer to the text and Diagram 9.</td>
</tr>
<tr>
<td><em>(Refer to text and flow chart)</em></td>
<td>If the Cardiac Risk Score is:</td>
</tr>
<tr>
<td></td>
<td>- ≥32: pilot is unfit for marine pilotage work. Refer for stress ECG and classify Temporarily Unfit for Duty pending results.</td>
</tr>
<tr>
<td></td>
<td>- 22-31: refer for stress ECG. Whilst awaiting results classify Fit for Duty Subject to Review or Temporarily Unfit for Duty depending on overall risk assessment.</td>
</tr>
<tr>
<td></td>
<td>- &lt;15 assess risk factors and other clinical data and refer to general practitioner as appropriate. Classify Fit for Duty or Fit for Duty Subject to Review depending on overall risk assessment. <em>Review as appropriate.</em></td>
</tr>
<tr>
<td></td>
<td>Refer related criteria as required e.g. hypertension, diabetes.</td>
</tr>
<tr>
<td><strong>Cardiac Defibrillator (AICD)</strong></td>
<td>The criteria for <em>Fit for Duty</em> are not met:</td>
</tr>
<tr>
<td></td>
<td>- if the person has a cardiac defibrillator implanted for ventricular arrhythmias.</td>
</tr>
<tr>
<td>**Cardiac Pacemaker *</td>
<td>The person should not perform pilotage work for <em>at least one month</em> after insertion of a pacemaker. The criteria for <em>Fit for Duty</em> are not met:</td>
</tr>
<tr>
<td><em>(Refer to warning re EMI on 64)</em></td>
<td>- if a cardiac pacemaker is required.</td>
</tr>
<tr>
<td></td>
<td><em>Fit for Duty Subject to Review</em> may be recommended, taking into account the opinion of a cardiologist with expertise in electrophysiology and the nature of the work:</td>
</tr>
<tr>
<td></td>
<td>- at least 1 month after insertion of the cardiac pacemaker; AND</td>
</tr>
<tr>
<td></td>
<td>- after consideration of the relative risks of pacemaker dysfunction (see also Cardiac Defibrillator); AND</td>
</tr>
<tr>
<td></td>
<td>- the VO₂ max is in the ‘above average’ range for age.</td>
</tr>
<tr>
<td>CONDITION</td>
<td>CRITERIA</td>
</tr>
<tr>
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</tr>
</tbody>
</table>
| Congenital Disorders | The criteria for *Fit for Duty* are not met:  
- if the person has a complicated congenital heart disorder.  
*Fit for Duty Subject to Review* may be recommended, taking into account the opinion of a cardiologist and the nature of the work:  
- if there is a minor congenital heart disorder such as pulmonary stenosis, atrial septal defect, small ventricular septal defect, bicuspid aortic valve, patent ductus arteriosus or mild coarctation of the aorta; AND  
- there are no other disqualifying conditions; AND  
- the VO\textsubscript{2} max is in the ‘above average’ range for age. |
| Coronary Artery Bypass Grafting (CABG) | The person should not perform pilotage work for **at least three months** after CABG.  
The criteria for *Fit for Duty* are not met:  
- following CABG.  
*Fit for Duty Subject to Review* may be recommended, taking into account the opinion of a cardiologist and the nature of the work:  
- at least 3 months after CABG; AND  
- there is minimal residual musculoskeletal pain after the chest surgery; AND  
- if the clinical history is one of minimal symptoms; AND  
- there is an exercise tolerance of \( \geq 90\% \) of the age/sex predicted exercise capacity on the Bruce Treadmill Test (or equivalent protocol) and the VO\textsubscript{2} max is in the ‘above average’ range for age; AND  
- there is no evidence of severe ischaemia, that is, less than 2mm ST segment depression on an exercise ECG and absence of a large defect on a stress perfusion scan; AND  
- there is an ejection fraction of 40% or over.  
The presence of other risk factors should also be considered. |
| Deep Vein Thrombosis (DVT) | The non-working period following DVT should be determined by the treating specialist.  
The criteria for *Fit for Duty* are not met:  
- if the person suffers deep vein thrombosis which is liable to recurrence or embolus.  
*Fit for Duty Subject to Review* may be recommended, taking into account the opinion of a specialist and the nature of the work:  
- following an appropriate non-working period; AND  
- depending on the cause of the thrombosis and the response to treatment. |
| Dilated Cardiomyopathy | The criteria for *Fit for Duty* are not met:  
- if the person has a dilated cardiomyopathy.  
*Fit for Duty Subject to Review* may be recommended, taking into account the opinion of a cardiologist and the nature of the work:  
- if the ejection fraction is greater than 40%; AND  
- the VO\textsubscript{2} max is in the ‘above average’ range for age. |
### ECG Changes: Strain Patterns, Bundle Branch Blocks or Heart Block

An ECG is only required if clinically indicated.

The criteria for *Fit for Duty* are not met:

- if the person has an electrocardiographic abnormality, for example left bundle branch block, pre-excitation or changes suggestive of myocardial ischaemia or previous myocardial infarction.

*Fit for Duty Subject to Review* may be recommended, taking into account the opinion of a cardiologist and the nature of the work:

- if the condition has been cured surgically; OR
- if the condition has been successfully treated medically for at least 3 months; OR
- there is an exercise tolerance of ≥90% of the age/sex predicted exercise capacity on the Bruce Treadmill Test (or equivalent protocol); AND
- the VO₂ max is in the ‘above average’ range for age; AND
- there are no other disqualifying conditions.

### Heart Failure

The criteria for *Fit for Duty* are not met:

- if the person has heart failure.

*Fit for Duty Subject to Review* may be recommended, taking into account the opinion of a cardiologist and the nature of the work:

- if there is an exercise tolerance of ≥90% of the age/sex predicted exercise capacity on the Bruce Treadmill Test (or equivalent protocol); AND
- there is an ejection fraction of 40% or over; AND
- there is a satisfactory response to treatment; AND
- the VO₂ max is in the ‘above average’ range for age; AND
- the underlying cause of the heart failure is considered.

### Heart/Lung Transplant

The person should not perform pilotage work for at least three months post-transplant.

The criteria for *Fit for Duty* are not met:

- if the person has had a heart or heart/lung transplant.

*Fit for Duty Subject to Review* may be recommended, taking into account the opinion of a transplant cardiologist and the nature of the work:

- if the VO₂ max is in the ‘above average’ range for age.

### Hypertension (refer to Diagram 12, page 66)

The criteria for *Fit for Duty* are not met:

- if the person’s sitting blood pressure is consistently 200/110 or greater (treated or untreated); OR
- if there is end organ damage (cardiac, cerebral, or retinal) which will impair safe working; OR
- if treatment results in marked postural hypotension or impaired alertness.

The presence of other risk factors should also be considered.

Persons with blood pressure **greater than 200/110** should be classified Temporarily Unfit for Duty until fully assessed and the opinion of a cardiologist obtained. Fitness for Duty Subject to Review may be considered if treatment is satisfactory with blood pressure less than 200/110 over a four-week follow-up period.

Persons with blood pressure **between 150/95 – 200/110** may be classed Fit for Duty Subject to Review at least 3 monthly. A blood pressure of less than 150/95 should be obtained within 9 months. If not the patient should be classed Unfit for Duty.

Persons with blood pressure **less than 150/95** may be classed Fit for Duty Subject to Review.

Persons with blood pressure **less than 140/90** who obtain this level only after treatment should be classed Fit for Duty Subject to Review.

Refer to flowchart (Diagram 12) on page 66.
<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypertrophic Cardiomyopathy (HCM)</strong></td>
<td>The criteria for <em>Fit for Duty</em> are not met:  &lt;br&gt;• if the person has Hypertrophic Cardiomyopathy.  &lt;br&gt;<em>Fit for Duty Subject to Review</em> may be recommended, taking into account the opinion of a cardiologist and the nature of the work:  &lt;br&gt;• if the person is asymptomatic; AND  &lt;br&gt;• the left ventricular ejection fraction is &gt;40; AND  &lt;br&gt;• there is an exercise tolerance of ≥90% of the age/sex predicted exercise capacity on the Bruce Treadmill Test (or equivalent protocol) without significant cardiac symptoms or significant ST segment (&gt;2mm) shift and the VO2 max is in the ‘above average’ range for age; AND  &lt;br&gt;• an absence of severe left ventricular hypertrophy, a family history of sudden death, or ventricular arrhythmia on Holter testing.</td>
</tr>
<tr>
<td><strong>Pulmonary Embolism</strong></td>
<td>The non-working period following pulmonary embolism should be determined by the treating specialist.  &lt;br&gt;The criteria for <em>Fit for Duty</em> are not met:  &lt;br&gt;• if the person has suffered a pulmonary embolism.  &lt;br&gt;<em>Fit for Duty Subject to Review</em> may be recommended, taking into account the opinion of an appropriate specialist and the nature of the work:  &lt;br&gt;• following an appropriate non-working period; AND  &lt;br&gt;• depending on the cause of the embolus and response to treatment; AND  &lt;br&gt;• the VO2 max is in the ‘above average’ range for age.</td>
</tr>
<tr>
<td><strong>Stroke</strong></td>
<td>See Neurological Disorders (page 92).</td>
</tr>
<tr>
<td><strong>Syncope due to Hypotension (Vasovagal and autonomic dysfunction)</strong></td>
<td>The criteria for <em>Fit for Duty</em> are not met:  &lt;br&gt;• if the condition is severe enough to cause episodes of loss of consciousness without warning.  &lt;br&gt;<em>Fit for Duty Subject to Review</em> may be recommended, taking into account the opinion of an appropriate specialist and the nature of the work depending on:  &lt;br&gt;• identification of the underlying cause; AND  &lt;br&gt;• the institution of satisfactory treatment.  &lt;br&gt;The person should not perform pilotage work for <em>at least three months</em> after syncope.</td>
</tr>
<tr>
<td><strong>Valvular Heart Disease</strong></td>
<td>The criteria for <em>Fit for Duty</em> are not met:  &lt;br&gt;• if the person has any history or evidence of valve disease, with or without surgical repair or replacement, associated with symptoms or a history of, embolism, arrhythmia, cardiac enlargement (on chest X-ray greater than 16cm), abnormal ECG, high blood pressure; OR  &lt;br&gt;• if the person is taking anti-coagulants.  &lt;br&gt;<em>Fit for Duty Subject to Review</em> may be recommended noting the criteria specified above in relation to anti-coagulant therapy; or  &lt;br&gt;• if mitral stenosis is present with echocardiograph evidence of moderate (valve area &lt;1.5cm²) or severe stenosis.  &lt;br&gt;<em>Fit for Duty Subject to Review</em> may be recommended, taking into account the opinion of a cardiologist and the nature of the work:  &lt;br&gt;• if the person’s cardiological assessment shows mild valvular disease of no haemodynamic significance, and there is no other cardiac condition per this standard which would render the person unfit to perform pilotage work; OR  &lt;br&gt;• three months following successful surgery and there is no other cardiac condition per this standard which would render the person unfit to perform pilotage work; AND  &lt;br&gt;• and the VO2 max is in the ‘above average’ range for age.</td>
</tr>
</tbody>
</table>
### MEDICAL CRITERIA FOR MARINE PILOTS– CARDIOVASCULAR DISEASES (CONT)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
</table>
| VO₂       | • Recruitment. At recruitment the VO₂ max should be in the ‘above average’ or better range.  
            • Periodic examinations. The trend for should be noted at each examination allowing for a trend with age. If there is an untoward trend the reasons for this should be discussed and investigated as appropriate, in conjunction with the general practitioner. If the VO₂ max decreases to the ‘average’ range the pilot should be classified Temporarily Unfit until the cause is determined and fitness satisfactorily recovered.  
            • Haemoglobin should be within normal values. |

### References

6. Cardiovascular Disease and Driving [www.csanz.edu.au](http://www.csanz.edu.au)
5. DIABETES

5.1 RELEVANCE TO MARINE PILOTS

Diabetes may affect the ability to pilot a ship either through decreased cognitive performance or loss of consciousness in a hypoglycaemic episode, or from end organ effects on relevant functions, including effects on vision, the heart, the peripheral nerves and vasculature of the extremities particularly the feet.

The main hazard in marine pilots with diabetes is the occurrence of hypoglycaemia. It is mainly associated with insulin but can occur with oral treatments.

Pilots work shifts and need to be responsive to shipping movements which is not conducive to regular meal times.

(There are no direct references to diabetes and pilotage. Therefore the literature on diabetes and driving has had to serve as a proxy.)

5.2 ASSESSMENT AND MEDICAL CRITERIA

Established diabetes may be diagnosed from the Marine Pilot Health Questionnaire. If this is evident at recruitment, careful assessment of the adequacy of control, particularly regarding past hypoglycaemic events, and evidence of ability to cope with shiftwork as well as an absence of end organ effects is required before acceptance for employment.

Sub-clinical diabetes may be diagnosed on a fasting blood test. The marine pilot health assessment requires fasting plasma glucose to be measured. This should be assessed independently regarding diabetes as well as an input into the Cardiovascular Risk Score (refer to page 58). Such pilots should be classed Temporarily Unfit while being assessed and stabilised on their treatment regimen.

Diabetes can affect several end organs (vision, heart, nerves, peripheral blood vessels, etc) and the relevant chapters should be referred to in total assessment and management of the diabetic patient. For example, treatment of diabetic retinopathy by laser may alter visual fields or acuity and the relevant standard should be consulted in the Vision and Eye Disorders chapter. The presence of diabetes is an important factor in the Cardiac Risk Score for pilots (refer to Cardiovascular Fitness and Disease, page 58).

Adequacy of control of diabetes may be assessed by tests including glycosylated haemoglobin and review of home blood glucose monitoring records. Pilots who have diabetes controlled either by tablets or insulin, if classed Fit for Duty Subject to Review, should frequently monitor their blood glucose particularly on working days. This is partly so the pilot knows they are safe for work and partly so control of their diabetes can be readily checked at their triggered review. The advent of automated devices (glucometers) enables the results to be stored and monitored better than a diary and are therefore preferred.

Where there is a transition from oral treatment to insulin, work should cease until good stability of control is achieved as determined by a specialist. The duration of time off work will depend on the regimen being introduced but is typically a few weeks. The frequent use of a glucometer and/or use of a continual glucose monitor may help improve self-management.

The pilot should also be advised to take appropriate precautionary steps to avoid hypoglycaemic episodes, for example:

- self monitoring of blood glucose levels;
- carrying of glucose whilst working;
- compliance with specified review periods (general practitioner or specialist); and
- cessation of piloting work (or other safety critical work) should a hypoglycaemic episode occur.

Job modification such as temporary altered rosters to help achieve stability of control may be considered.

When assessing a pilot with insulin treated diabetes an annual report from the person’s general practitioner, or an independent specialist physician or endocrinologist is recommended. The report should include details of general health, indication of satisfactory diabetes control and freedom from severe complications.

5.2.1 Hypoglycaemia and hypoglycaemic unawareness

Hypoglycaemia is particularly important in marine pilots because impairment of consciousness and judgment may develop rapidly and result in the loss of control.

A defined hypoglycaemic event is one of sufficient severity to cause impairment of perception, impairment of motor skills or consciousness, or abnormal behaviour and often requires assistance for recovery. It is to be distinguished from mild hypoglycaemic symptoms such as sweating, tremulousness, hunger and tinglying around the mouth which are common occurrences in the life of a person with diabetes treated with insulin and some hypoglycaemic agents.

People with diabetes are trained to aim for normal glucose levels in order to prevent long-term end organ damage due to hyperglycaemia. This presents a challenge for managing workers such as pilots to minimise risk of hypoglycaemia.

Hypoglycaemia may be caused by many factors including alteration to medication, unexpected exertion or irregular meals. Irregular meals may be an important consideration with those operating on shifts. The frequency of any mild hypoglycaemic attacks and of any significant hypoglycaemia should be recorded.
The pilot who has a defined hypoglycaemic episode at any time should be classified as Temporarily Unfit for Duty and should not perform marine piloting tasks until they have been cleared by the specialist. They should not work for a period of at least 3 months: a longer period may be determined depending on the causal circumstances and any previous episodes. During the 3 months they should be restablised by education, changes to insulin regimens, use of glucometer or continual glucose monitor to improve self-management, awareness of hypoglycaemia training and treatment, etc. On resuming work they should be frequently monitored for at least 12 months regarding symptoms and blood tests (glucose and HbA1C), etc.

New developments may be helpful to reducing the incidence of hypoglycaemic episodes. These developments include new forms of insulin (insulin analogues), insulin pump therapy and devices for real-time monitoring of interstitial glucose, which sound an alarm if the levels fall too low. The benefits and possible risks associated with these developments should be considered in consultation with the patient's specialist.

Loss of awareness of the onset of hypoglycaemia (hypoglycaemic unawareness) is an important consideration. People with long standing diabetes can develop unawareness of the early symptoms of hypoglycaemia, especially those individuals frequently experiencing low blood glucose levels. They can progress directly into the more severe stage of brain and nervous system dysfunction, although the changes can be very subtle initially. Hypoglycaemic unawareness may be diagnosed if there is self-metered blood glucose levels of \(<3.0\) on repeated occasions without neurohumoral symptoms. Whenever hypoglycaemic unawareness is suspected specialist review is advisable. Recommendations may include blood glucose awareness training (BGAT), education and changes in management.

If an individual is subject to lack of awareness of hypoglycaemic symptomatology, then they are unsuitable for the marine pilot role until responsive to treatment as determined by a specialist.

Medical criteria for fitness for duty are outlined in the table below.

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes controlled by diet alone</td>
<td>A person with Diabetes controlled by diet alone, without severe complications, may perform pilotage duties without restriction. They should be reviewed periodically regarding progression of the illness.</td>
</tr>
</tbody>
</table>
| Non-Insulin Requiring Type 2 Diabetes Mellitus | The criteria for **Fit for Duty** are not met:
- if the person has Non-Insulin Requiring Diabetes Mellitus and is on oral hypoglycaemic agents.
**Fit for Duty Subject to Review** may be recommended, taking into account the opinion of a specialist in Diabetes or Endocrinology and the nature of the work if:
- the condition is well controlled and the person is compliant with treatment and monitors their blood sugar regularly; AND
- there is an absence of defined hypoglycaemic episodes as assessed by the specialist; AND
- the person has awareness (sensation) of hypoglycaemia; AND
- the person is taking agents that provide the minimum risk of hypoglycaemia whilst providing best possible glycaemic control; AND
- there is an absence of end organ effects that may affect working per these standards; AND
- there is evidence of the ability to cope with rosters and shift work and maintain glycaemic control.

A person may be classified **Fit for Duty Subject to Review** pending review by a specialist if there is sufficient evidence that the person is well-controlled, including discussion with the persons treating doctor/general practitioner.

If it is necessary to introduce insulin then the criteria for insulin should be applied (see below).
<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
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</thead>
</table>
| Insulin-Requiring Diabetes Mellitus (both Types 1 and 2) | The criteria for *Fit for Duty* are not met:  
  - if the person has Insulin Requiring Diabetes Mellitus or is being graded from oral treatment to insulin.  
  *Fit for Duty Subject to Review* may be recommended, taking into account the opinion of a specialist in Diabetes or Endocrinology and the nature of the work and subject to at least annual review if:  
  - the condition is well controlled and the person is compliant with treatment; AND  
  - there is an absence of defined hypoglycaemic episodes as assessed by the specialist; AND  
  - the person has awareness (sensation) of hypoglycaemia; AND  
  - the person is taking agents that provide the minimum risk of hypoglycaemia whilst providing best possible glycaemic control; AND  
  - the person maintains a record of blood sugar levels using an automated device; AND  
  - there is an absence of end organ effects that may affect working per these standards; AND  
  - there is evidence of the ability to cope with rosters and shift work and maintain glycaemic control.  
  A person may be classified *Fit for Duty Subject to Review* pending review by a specialist if there is sufficient evidence that the person has diabetes which is well-controlled. This may require discussion with the person’s general practitioner with their consent.  
  If it is necessary to introduce insulin then pilotage work should cease until good stability of control is achieved as determined by a specialist. The duration off work will depend on the regime being introduced but is typically a few weeks. |
| Hypoglycaemic episode | In the event of a defined hypoglycaemic episode occurring the pilot should be immediately classed *Temporarily Unfit for Duty*, and should not perform pilotage duties for a period determined by a specialist. The period should be a minimum of three months but may be longer depending on the causal circumstances and any previous episodes. Return to work should be carefully monitored (see text).  
  Hypoglycaemia unawareness does not meet the criteria (see text). |

References  
1. NHMRC, Diabetes and driving, Canberra, 1992

Further reading  
MacLeod, K.M., Diabetes and driving: towards equitable, evidence-based decision-making, Diabetic Medicine, 16(4), 282-290, 1999  
6. DRUGS – ILLICIT

6.1 RELEVANCE TO MARINE PILOTS

Many of the physiological effects of illicit drugs are similar to both alcohol and psychoactive prescription drugs. Their usage is therefore likely to cause a significant safety hazard to marine pilot work. This is particularly so where illicit drugs are used in combination with prescription drugs or alcohol.

This standard supports alcohol and drug policies through the provision of advice to Authorised Health Professionals regarding the management of suspected impairment at the time of health assessment and the interpretation of drug screen results (if conducted). However specific procedures for drug and alcohol screening are beyond the scope of this standard.

The Authorised Health Professional should acquaint themselves with procedures of the organisation for which they provide services.

6.1.1 Effect of drugs on pilotage

Illicit drugs are by their nature psychoactive (or psychotropic). This means their detrimental effects in safety terms are not limited to their demonstrated physiological effects on the pilot’s physical skills, but extend to their psychological or behavioural effects. Those under the influence of these drugs have a higher propensity to behave in a manner incompatible with safe working. This may involve but not be limited to, risk taking, aggression, feelings of vulnerability, narrowed attention and poor judgement.

Information regarding effects of stimulants on risk of accidents mainly comes from road crash data. Stimulant drugs such as amphetamines and cocaine, which produce a heightened sense of wellbeing, uninhibited behaviour, increased aggression and risk taking behaviours, obviously have a potential for causing accidents.

These drugs have been used to combat fatigue and while they may initially increase alertness and efficiency, their effect is notoriously unpredictable and may be accompanied by marked changes in mood and behaviour. The use of illicit (and licit) stimulants to counteract the effects of fatigue carries with it the risk of fatigue rebound. This is observed when the effect of the drug wears off and is associated with profound sleepiness, which can result in a person suddenly falling asleep, with consequent risk of accident.

Amphetamines may be prescribed for ADHD, which is usually a condition of childhood. However, this condition has been recognised in adults who may benefit from amphetamine type medication. In this situation an exemption may be sought from the port operator from any bans on pilots showing amphetamines on testing providing they are stable and otherwise fit for duty.

There is little information about safety critical work such as pilotage and the short or long-term effects of drugs such as LSD, heroin and designer drugs (for example, Ecstasy, Angel Dust). However, the known clinical effects of these drugs indicate that they would have adverse effects on piloting skills and judgement. Given their significant affect on mood and behaviour, their use is clearly not compatible with safety critical work.

Cannabis can impair psychomotor functions, however there is still debate about the duration of impairment outside laboratory experiments.

Methadone abuse is not compatible with safety critical work. However, it is recognised that methadone may be prescribed for narcotic addiction and in some circumstances such persons may be recommended Fit for Duty Subject to Review.

The combination of alcohol with illicit drugs is especially dangerous.

Opioid derivatives such as codeine may be used for pain relief. This legitimate usage of opioids needs to be taken into account when assessing impairment or conducting drug screening.

6.2 ASSESSMENT AND MEDICAL CRITERIA

Careful individual assessment must be made of pilots who use illicit psychoactive drugs. Additional advice from those involved in specialised treatment centres may be necessary and ongoing assessment is likely to be important, including blood tests. Pilots with a history of ‘dual diagnosis’ (drug abuse and psychiatric states) in particular may require specialist assessment regarding working as a marine pilot.

Users of illicit drugs are unlikely to volunteer information about their condition. This creates a problem in identifying cases of illicit drug use.

Screening may also be required by management at a Triggered Health Assessment.

Occasional use of illicit drugs requires very careful assessment. Some organisations may have a policy of counselling or disciplining the pilot who is found to have an isolated case of drug use. The health professional should be aware of the port operators’ local policies in this regard.

If during an Initial Licensing or Periodic Health Assessment, the health professional has a reasonable belief that the pilot may be impaired by a drug (prescribed or illicit), based on observation of abnormal or uncharacteristic signs in relation to speech, eyes, breathing, skin, actions, movement, balance, attitude and comprehension, this should be discussed with the pilot.

Where no satisfactory medical basis for impairment is established, (that is a prescription
medication or OTC drug taken for a defined purpose, or a medical condition) the pilot should be classified as Temporarily Unfit for Duty Subject to Review. The port operator’s management should be contacted and advised that the person has impairment for which no medical basis could be found. Management will then direct the steps to be taken which may include a drug screen. This is illustrated in Diagram 13.

Interpretation of drug screen results is a difficult area and referral to a doctor who specialises in reviewing positive results may be appropriate in some cases. The most common illicit drug detected is cannabis and its metabolites. Generally a level of 50ng/mL on GCMS is considered to be positive but this can be difficult to interpret because of the long half life of cannabis and also because the detected level does not necessarily correspond to the level of impairment. Nevertheless, the impact of cannabis use on the functioning of the marine pilot’s decision-making process cannot be underestimated.

Other illicit drugs such as heroin, cocaine and MDMA are less commonly found on drug screen because of their shorter half-lives and their relatively less common usages. A positive result for morphine on urinary analysis cannot be extrapolated to heroin use.

Medical criteria for fitness for duty are outlined in the table on page 79.

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**Diagram 13. Periodic health assessment – management of possible impairment due to alcohol or drugs (illicit or prescription/OTC)**

Is there evidence of impairment? Preliminary Impairment Assessment (speech, eyes, breathing, skin, actions, movements, balance, attitude, comprehension).

---

NO

No further action (continue with health assessment)

---

YES

Discuss with worker

Is there a medical basis for impairment, i.e. medical condition causing impairment or prescription/OTC medication taken for a defined purpose.

---

YES

Medical basis

- Classify Temporarily Unfit for Duty.
- If appropriate, discuss medication with general practitioner/treating doctor in order to resolve impact on employment.
- If appropriate, refer to relevant chapter for medical conditions.
- Identify review period.

---

NO

If alcohol or illicit drug use suspected:

- Classify Temporarily Unfit for Duty and advise on report impairment without clear medical basis.
- Contact employer regarding impairment without clear medical basis and await further instructions from employer.
### MEDICAL CRITERIA FOR MARINE PILOTS – DRUGS – ILLICIT

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impairment due to illicit drugs</td>
<td>The criteria for <em>Fit for Duty</em> are not met:&lt;br&gt;  - if the pilot is impaired by illicit drug/s.  &lt;br&gt;Refer to Diagram 13 for management.</td>
</tr>
<tr>
<td>I illicit drugs – Use and Dependence &lt;br&gt;Narcotics, Analgesic abuse, methadone (illicit use), and other illicit drug use</td>
<td>The criteria for <em>Fit for Duty</em> are not met:&lt;br&gt;  - if there is evidence of illicit drug use or dependence. &lt;br&gt;<em>Fit for Duty Subject to Review</em> may be recommended taking into account the opinion of an appropriate specialist and the nature of the work:&lt;br&gt;  - for persons who are compliant with treatment for illicit drug addiction (including methadone or buprenorphine medication); AND  &lt;br&gt;  - the severity of the addiction(s), the response to treatment and any co-morbidities, are taken into account.  &lt;br&gt;<em>Fit for Duty Subject to Review</em> may be recommended, taking into account the opinion of an appropriate specialist, and the nature of the work where amphetamines/stimulants are prescribed for a medical condition, for example, ADHD.</td>
</tr>
</tbody>
</table>

**Further reading**


7. DRUGS – PRESCRIPTION AND OVER THE COUNTER (OTC).

7.1 RELEVANCE TO MARINE PILOTS

Studies show that common medications prescribed for a number of illnesses, including anxiety and depression, can affect work performance and increase the likelihood of accidents.

This standard supports alcohol and drug policies through the provision of advice to Authorised Health Professionals regarding the management of suspected impairment at the time of health assessment and the interpretation of drug screen results (if conducted). However specific procedures for drug and alcohol screening are beyond the scope of this standard. The Authorised Health Professional should acquaint themselves with procedures of the organisation for which they provide services.

7.2 GENERAL CONSIDERATIONS FOR PRESCRIBING AND MANAGEMENT

In all cases when health professionals are prescribing or dispensing medications (including OTC and alternative medications), they should consider any possible effects on safe working skills and advise the pilot on what they should do to avoid impairment. Failure to do so may have medico-legal consequences for the health professional in the event of a marine incident involving the pilot.

Prescribing or dispensing of any drug for the first time should be accompanied by a general warning to the pilot to be vigilant for responses that may affect ordinary activities including safety critical work. A similar warning should accompany changes in dose, or the addition of other drug treatment.

Problems affecting fitness for duty may arise with short-term use of drugs when the condition being treated does not itself preclude working, for example, drowsiness due to (older generation) antihistamines for hay fever. The subjective effects of the drug should be determined by a test dose before working is attempted.

Legitimate long-term medication for therapy or prophylaxis should not automatically preclude fitness for duty. Many drugs however can diminish the capacity for safe working in addition to any such effects of the disorder being treated. Successful treatment will often increase safety by control of the disorder, for example, effective prevention of seizures. Issues relating to drug treatment of chronic disorders such as epilepsy, psychiatric conditions and diabetes are dealt with in the relevant sections devoted to these diseases.

Pilots receiving continuing long-term drug treatment should be evaluated for their reliability in taking the drugs according to directions and their understanding of the possibility that the effect of the drug may be unexpectedly affected by factors such as drug interactions. They should also be assessed for their acceptance that their medicines can have undesired consequences that may affect their ability to work safely.

Opioid derivatives such as codeine or buprenorphine may be used for pain relief for example for low back pain. This legitimate usage of opioids needs to be taken into account when assessing impairment or conducting drug screening. However consideration also needs to be given to possible effects on cognitive functions particularly from prolonged or high doses. There is no specific advice on assessing this side-effect but desirably a pilot would begin any necessary course on days off and be assessed for alertness prior to working.

Combined effects of prescribed and OTC medications should also be considered. When such medicine is prescribed or dispensed adequate counselling should be provided and labelling requirements complied with. There are many useful community information resources for patients, including the Australian Drug Foundation website www.adf.org.au/dd/index.htm.

7.3 ASSESSMENT AND MEDICAL CRITERIA

All pilots are required to take all current medication or a list to the health assessment appointment for the purposes of identifying any potential impact on marine piloting.

If during a Periodic Health Assessment, the health professional has a reasonable belief that the pilot may be impaired by a drug (prescribed or illicit), based on observation of abnormal or uncharacteristic signs in relation to speech, eyes, breathing, skin, actions, movement, balance, attitude and comprehension) this should be discussed with the pilot. If a medical basis for possible impairment is established (that is, a prescription medication or OTC drug is being taken for a defined purpose, or a medical condition), the health professional should classify the pilot as Temporarily Unfit for Duty Subject to Review and identify a review date. Where appropriate, the pilot’s general practitioner may be contacted to discuss the impact of their current treatment on their fitness for duty.

Where there is not a satisfactory medical basis for impairment, (that is a prescription medication or OTC drug taken for a defined purpose, or a medical condition), the pilot should be classified as Temporarily Unfit for Duty Subject to Review. The operator should be contacted and advised that the person has impairment for which no medical basis could be found. The operator will then direct the steps to be taken as shown in Diagram 14.

Medical criteria for fitness for duty are outlined in the table on page 81.
**Diagram 14. Periodic health assessment – management of possible impairment due to alcohol or drugs (illicit or prescription/OTC)**

**Is there evidence of impairment?**

*Preliminary Impairment Assessment (speech, eyes, breathing, skin, actions, movements, balance, attitude, comprehension).*

**YES**

**Discuss with worker**

Is there a medical basis for impairment, i.e. medical condition causing impairment or prescription/OTC medication taken for a defined purpose.

**YES**

**Medical basis**

- Classify Temporarily Unfit for Duty.
- If appropriate, discuss medication with general practitioner/treating doctor in order to resolve impact on employment.
- If appropriate, refer to relevant chapter for medical conditions.
- Identify review period.

**NO**

**Medical basis**

- Classify Temporarily Unfit for Duty.
- If appropriate, discuss medication with general practitioner/treating doctor in order to resolve impact on employment.
- If appropriate, refer to relevant chapter for medical conditions.
- Identify review period.

**NO**

**No further action**

(continue with health assessment)

**If alcohol or illicit drug use suspected:**

- Classify Temporarily Unfit for Duty and advise on report impairment without clear medical basis.
- Contact employer regarding impairment without clear medical basis and await further instructions from employer.

**MEDICAL CRITERIA FOR MARINE PILOTS – DRUGS – PRESCRIPTION AND OTC**

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
</table>
| Impairment due to prescription or OTC drugs | The criteria for *Fit for Duty* are not met:  
- if the person is impaired due to the effects of prescription or OTC drugs.  
Refer to Diagram 14 for management. |

**References**

5. British Medical Association website on Driving under the influence of drugs (via [www.bma.org.uk](http://www.bma.org.uk)).
8. Victorian Parliamentary Road Safety Committee Report, Effects of Drugs (Other than Alcohol) on Road Safety in Victoria 1996.
8. EPILEPSY

8.1 RELEVANCE TO MARINE PILOTS

Epilepsy may affect the ability to pilot ships due to sudden loss of concentration or collapse.

Epilepsy is a common disorder with a cumulative incidence of 2% of the population, with 0.5% affected and taking medication at any one time. Fortunately, the majority of cases respond well to treatment with a terminal remission rate of 80% or more. The majority suffer few seizures in a lifetime and about half will have no further seizures in the first one or two years after starting treatment. Some cases may eventually cease medication and in other selected cases surgery has proven beneficial.

Seizures vary considerably, some being purely subjective experiences, for example, some simple partial seizures. The majority however involve some impairment of consciousness (for example, absence and complex partial seizures) or loss of control (for example, focal motor, simple or complex partial or myoclonic seizures). Convulsive (tonic-clonic) seizures may be generalised from onset or secondarily generalised with partial onset. Seizures associated with loss of awareness, even if brief or subtle, or loss of motor control have the potential to impair the ability to perform safety critical work (such as piloting ships).

There is no data on epilepsy and accidents directly relevant to pilots. Information regarding risk of accidents due to epilepsy mainly comes from road crash data. Estimates of the relative casualty crash risk of drivers with epilepsy compared with other drivers has varied from 1.0 to 1.95 (and in one exceptional study 7.0). Around 11% of crashes of drivers with epilepsy are felt to be seizure-related. Reported estimates of the prevalence of epilepsy-related crashes vary between 0.01% and 0.3% of all crashes.

Complex partial seizures without aura, secondarily generalised seizures and generalised tonic-clonic seizures are the types most implicated in road crashes. Simple partial seizures, complex partial seizures with aura and absence seizures are less frequently implicated, and myoclonic seizures are rarely implicated.

Other examples include seizures that have occurred only during sleep, some, but not all, simple partial seizures (‘auras’), and seizures that are consistently preceded by a prolonged warning or premonition (provided that full control is retained during the period of such premonitory symptoms).

There are also examples where seizures only occur at a particular time of day, especially in the first hour after awakening.

8.2 ASSESSMENT AND MEDICAL CRITERIA

Medical criteria for fitness for duty are outlined in the table overleaf.

An initial or isolated seizure or a confirmed diagnosis of epilepsy will mean that the criteria for fit for duty are not met.

It is extremely important that the pilot’s specific epilepsy syndrome and seizure types are identified so that an adequate evaluation of the person’s safety can be undertaken (including the risk of further seizures) and the appropriate therapy instituted. Thus, any applicant who has a history of seizures or epilepsy and any marine pilot experiencing a seizure or recurrent seizures, should be referred to an appropriate consultant for detailed evaluation.

The table recommends seizure-free periods after which resumption of work may be permitted on the advice of a suitably qualified consultant. In considering the recommended seizure-free period, the longer period should generally be applied, but a shorter period may be accepted on the recommendation of a physician experienced in the management of epilepsy. Relevant considerations will include response to treatment, previous seizure frequency, the nature of seizures, the syndromic diagnosis and the patient’s reliability and compliance with treatment. Further considerations are the duties to be performed and the hours to be worked particularly rotating shift work.

In the assessment of a pilot’s fitness for duty and ongoing disease management, the health professional should take the following into account:

- In order to be classified Fit for Duty Subject to Review the pilot must have been free of seizures for the specified period (see medical criteria table overleaf).
- The pilot must continue to take anti-epileptic medication regularly when and as prescribed. They should be advised that this is a requirement of their continued ability to undertake pilotage duties. Withdrawal of medication may occur under strict supervision.
- The pilot should be made aware of the impact of fatigue on their condition and should ensure adequate sleep. They should be advised that they must not pilot/work if sleep deprived.
- The pilot should also avoid other circumstances or the use of substances that are known to increase the risk of seizures e.g. alcohol (refer to page 50).

All marine pilots who need active management of epilepsy should be under review, including where necessary, at least annual specialist appraisal. The use of an independent specialist may be considered.
8.2.1 The initial or isolated seizure
The occurrence of a seizure in a marine pilot warrants immediate suspension from piloting duties and consultant assessment. The assessment may reveal that the seizure was likely to have been an isolated event, or alternatively a diagnosis of epilepsy may be made. The pilot should be classified Temporarily Unfit for Duty until the diagnosis and response to treatment is determined and a decision can be made regarding their fitness for duty.

In the case of an isolated seizure the minimum seizure-free period before returning to piloting duties is one year (unless otherwise advised by a specialist in epilepsy). The pilot should be classified Temporarily Unfit for Duty until the diagnosis and response to treatment is determined and a decision can be made regarding their fitness for duty. In the event of confirmation of the diagnosis the pilot will be excluded from work for at least 1 year and classed as Permanently Unfit.

Provocative and potentially avoidable causes of a seizure such as lack of sleep, alcohol or flashing lights, etc should be sought for and taken into account in determining the exclusion period.

When no provocative causes are found the person may be treated by observation and no medication but will be excluded for 5 years. This will enable confirmation or otherwise of epilepsy.

8.2.2 Safe Seizures (Nocturnal Epilepsy, etc)
Where seizures occur only at a particular time of day (for example, in the first hour after awakening or do not result in loss of consciousness, etc) a recommendation may be made regarding Fit for Duty Subject to Job Modification, limiting working to certain hours or circumstances. Pilots experiencing such safe or possibly safe seizures must be the subject of consultant review and their assessment must include appropriate documentation of the factors that are important to their safety, and the corroboration of eye witnesses whenever possible.

8.2.3 Surgical treatment of epilepsy
After surgery for the treatment of epilepsy the minimal period before returning to piloting is five years and the pilot would be classed as Permanently Unfit. Side effects of surgery, such as on the visual tract, may also need to be assessed.

8.2.4 Recurrent seizure
In the event of a recurrent seizure in a person previously seizure-free and classed Fit for Duty Subject to Review, a consultant review should be obtained. Provocative causes may be taken into account. A recurring seizure in a marine pilot will require immediate suspension from piloting duties.

8.2.5 Medication non-compliance
Where non-compliance with anti-epileptic medication is suspected, drug monitoring may be required where appropriate.

8.2.6 Medication withdrawal
Withdrawal of anti-epileptic medication is usually not compatible with continued pilotage duties, unless explicitly recommended and supervised by a consultant specialised in epilepsy.

8.2.7 Concurrent conditions
Where epilepsy is associated with other impairments or conditions, the relevant sections covering those disorders should also be consulted.
## MEDICAL CRITERIA FOR MARINE PILOTS – EPILEPSY (CONT)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Epilepsy - general requirements</strong></td>
<td>The criteria for <em>Fit for Duty</em> are not met:</td>
</tr>
<tr>
<td></td>
<td>- if the person has confirmed epilepsy.</td>
</tr>
<tr>
<td></td>
<td><em>Fit for Duty Subject to Review</em> may be recommended taking into account the opinion of a specialist in epilepsy, and the nature of the work if:</td>
</tr>
<tr>
<td></td>
<td>- the person maintains at least annual review; AND</td>
</tr>
<tr>
<td></td>
<td>- is compliant with anti-epileptic medication; AND</td>
</tr>
<tr>
<td></td>
<td>- has been seizure-free for five years*; AND</td>
</tr>
<tr>
<td></td>
<td>- has had no more than three seizures in the preceding ten years; AND</td>
</tr>
<tr>
<td></td>
<td>- the EEG shows no epileptiform activity.</td>
</tr>
<tr>
<td></td>
<td>*A specialist in epilepsy may recommend variation of the seizure-free period in exceptional circumstances including nocturnal epilepsy.</td>
</tr>
<tr>
<td><strong>Past history of febrile seizures or of benign childhood epilepsy</strong></td>
<td>The criteria for <em>Fit for Duty</em> are not met:</td>
</tr>
<tr>
<td></td>
<td>- if the person has a past history of febrile seizures or of benign childhood epilepsy.</td>
</tr>
<tr>
<td></td>
<td><em>Fit for Duty Subject to Review</em> may be recommended, taking into account the opinion of a specialist in epilepsy, and the nature of the work if:</td>
</tr>
<tr>
<td></td>
<td>- the person does not take anti-epileptic medication; AND</td>
</tr>
<tr>
<td></td>
<td>- the EEG shows no epileptiform activity.</td>
</tr>
<tr>
<td><strong>Epilepsy – surgical treatment</strong></td>
<td>The criteria for <em>Fit for Duty</em> are not met:</td>
</tr>
<tr>
<td></td>
<td>- if the person has epilepsy and has had surgical treatment.</td>
</tr>
<tr>
<td></td>
<td><em>Fit for Duty Subject to Review</em> may be recommended taking into account the opinion of a specialist in epilepsy and the nature of the work if:</td>
</tr>
<tr>
<td></td>
<td>- the person maintains at least annual review; AND</td>
</tr>
<tr>
<td></td>
<td>- has been seizure-free for five years*; AND</td>
</tr>
<tr>
<td></td>
<td>- the EEG shows no epileptiform activity; AND</td>
</tr>
<tr>
<td></td>
<td>- there are no neurological side-effects relevant to other chapters.</td>
</tr>
<tr>
<td></td>
<td>*A specialist in epilepsy may recommend variation of the seizure-free period in exceptional circumstances.</td>
</tr>
<tr>
<td><strong>Recurrent seizure</strong></td>
<td>Recurrence of seizure in a marine pilot requires immediate suspension from piloting duties. Classify 'Temporarily Unfit for Duty' pending full assessment (refer to 8.2.2).</td>
</tr>
<tr>
<td><strong>Withdrawal of Anti-Epileptic Medication</strong></td>
<td>Withdrawal of anti-epileptic medication is not compatible with continued piloting duties unless supervised by a specialist.</td>
</tr>
</tbody>
</table>
References

Further Reading
9. HEARING

9.1 RELEVANCE TO MARINE PILOTS

Hearing is critical to the pilot’s work. It is intrinsic to bridge management, which requires open communication with bridge officers including closed-loop communication for confirmation of orders which offers safety in redundancy. The bridge is relatively quiet but the wings may be noisy when a sheltered place is needed to be found to use radio-communication.

There is extensive use of hand-held radios for communication with tugs, line boats, harbour control, etc again using closed-loop communication. Most hand-held radios can be amplified to help hearing in the case of poor reception. The pilot may need to hear voice (on the bridge) and radio inputs from various parties at the same time.

When descending the pilot’s ladder the pilot needs to communicate with the crewman on the cutter. This may be by voice or hand signals in bad weather.

9.1.1 Hearing aids and cochlear implants

Closed loop communication by its redundancy contributes to safety on the bridge, and similarly the use of hand signals in adverse weather provides redundancy in communication on the ladder. Therefore some degree of hearing loss requiring hearing aids may be permissible subject to meeting certain requirements. It is essential where hearing aids are prescribed that they are worn on the bridge and spare batteries must be carried, although aids may be removed when on the ladder to avoid wetting. The hearing loss should be monitored and the aids setting and function should be checked annually.

Pilots with a cochlear implant will generally have difficulty with speech recognition in background noise. Cochlear implants generally should not be used in marine piloting. Exemptions may be made by an ENT surgeon or audiologist based on careful consideration of the job requirements in relation to the type of cochlear implant.

9.1.2 Noise exposure

Pilots who are transferred by helicopter are noise exposed. It is crucial their hearing is protected for the reasons given above regarding doing their job. If the daily averaged noise exposure is excessive they also need to be managed as per NSW WorkCover regulations. However, the conduct of audiometry for hearing required to meet this standard is not to be confused with any audiometry required for compliance with noise regulations.

9.2 ASSESSMENT AND MEDICAL CRITERIA

Medical criteria for fitness for duty are outlined in the table on page 88. Compliance with the criteria should be initially assessed by audiometry as per Australian Standard AS/NZS 1269.4:2005: Occupational noise management - Auditory assessment.

If the criteria are not met, a speech discrimination in quiet hearing test may be arranged. The speech discrimination in quiet hearing test should be similar to the Civil Aviation Safety Authority test for aviation pilots conducted by Australian Hearing Services (see Designated Aviation Medical Examiner’s Handbook 2.12.4 Hearing, 2003).

If the pilot passes they may be classed Fit Subject to Review and any hearing loss monitored. The frequency of review will be determined by the progressiveness of the underlying pathology.

Pilots requiring hearing aids should also be assessed using the CASA speech in quiet test. They may be passed Fit Subject to Review and their hearing and hearing aid should be assessed at least annually.
MEDICAL CRITERIA FOR MARINE PILOTS– HEARING

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hearing</td>
<td>Compliance with the standard should be initially assessed by audiometry without hearing aids or use of a cochlear implant. The criteria for Fit for Duty are not met:</td>
</tr>
<tr>
<td></td>
<td>• If the person has an unaided hearing threshold worse than or equal to 35 dBA at .5, 1 and 2 KHz and 50 dBA at 3 KHz at any frequencies in either ear.</td>
</tr>
<tr>
<td></td>
<td>Fit for Duty Subject to Review may be recommended if the person passes a speech discrimination in quiet hearing test (see text). The frequency of review will be determined by the progressiveness of the underlying pathology.</td>
</tr>
<tr>
<td></td>
<td>Fit for Duty Subject to Review may be recommended if the person uses a hearing aid and passes a speech discrimination in quiet hearing test (see text). They should be reviewed at least annually. They should also be judged Fit for Duty Conditional upon wearing the hearing aid.</td>
</tr>
<tr>
<td></td>
<td>Cochlear implants are generally not acceptable.</td>
</tr>
</tbody>
</table>

References

1. ‘Hearing Disorders and commercial motor vehicle drivers' compiled by the University of Pittsburgh, March 1993.
10. MUSCULOSKELETAL DISORDERS (including BMI)

See also (page 62), Balance / Vertigo (page 55)

10.1 RELEVANCE TO MARINE PILOTS

Pilots need to embark and disembark ships using the pilot’s ladder as detailed in the Inherent Requirements (page 27). The ladder is up to 9 meters long and requires a vertical ascent or descent often in adverse weather conditions. Marine pilots therefore require soundness of limbs, neck, back and good balance.

The work requires considerable musculoskeletal fitness and is prone to accidents. The injury and medical retirement data for Sydney pilots illustrates the risks. Over the three-year period 2002/03 there were 27 injuries sustained, eight of which incurred lost time. Twelve affected the upper limb, four the lower limb, three both upper and lower limbs, seven affected neck and/or back and one was unspecified. The causes of nearly all injuries were associated with the pilot’s ladder. There were two cases of medical retirement: one was due to rotator cuff (shoulder) and elbow injuries; the other followed a cervical fusion (neck), which resulted in inability to look down to judge landing on the cutter safely.

Pilots, at present, are recruited from senior ships officers and have prior experience of ships ladders and heights.

**Body Mass Index (BMI)** - \(\text{(weight} / \text{height}^2)\) is also an important aspect of fitness for pilotage work. Excessive body mass (weight) places excessive strain on the musculoskeletal and cardio-respiratory systems when climbing/descending the pilot’s ladder and predisposes to injury. Excessive abdominal girth also causes the pilot’s centre of gravity to move away from the ladder increasing musculoskeletal strain. Excessive body mass also places extra load on the crewman on the cutter assisting the pilot on/off the ladder. An abdominal circumference of > 94 cm in a male and 80 cm in a female indicates central obesity.

10.2 ASSESSMENT AND MEDICAL CRITERIA

10.2.1 Musculoskeletal Assessment

The aim of a health assessment is to detect those marine pilots who may have difficulty in performing their duties, and to identify those pilots who would benefit from remedial exercises or functional restoration, or job modification where helicopters are an option.

The examination is conducted in conjunction with the Marine Pilot Health Questionnaire and the medical criteria summary (Diagram 6). The patient should be examined in suitable clothing so limbs and back can be inspected.

The examination primarily assesses functionality needed for climbing up and down the pilot’s ladder. Where an abnormality is found a more focused examination (and any necessary investigation/referral) is needed to define the patho-anatomical basis and implications for employment.

The musculoskeletal assessment features the following:

- identification of any scars, abnormalities or deformities which may prevent or limit marine pilot duties;
- assessment of neck rotation, flexion and extension;
- assessment of upper limb movement and strength including a Jamar grip test (refer to table of norms below);
- assessment of back rotation, flexion and extension including the Bridge (hover) test;
- assessment of lower limb movement including examination of gait, standing on toes and heels, squatting and rising, ‘duck walk’ and ‘bunny hop’ tests;

The examination is guided by content of the Health Assessment Record Form (refer to Appendix 1, page 123). All information should be used in assessing musculoskeletal fitness. In some cases a functional assessment of a pilot by an Occupational Therapist may be helpful. Sydney and Newcastle have pilot’s ladders rigged-up on land, which may be used in return to work assessments noting they do not simulate the roll and pitch of a ship and the cutter.

Where there is an amputation it should be assessed on functional merits. Where a prosthesis is worn this should be similarly assessed.

Medical criteria for fitness for duty for marine pilots are outlined in Diagram 15 overleaf and in Table 11.
Diagram 15. Musculoskeletal system: inherent requirements and medical criteria for climbing up or down pilot’s ladder

**NECK MOVEMENTS**

- Need to:
  - look up, down, sideways to climb ladder and judge distance to ship or cutter.

- **CRITERIA:** Able to move neck so as to achieve all movements described.

**UPPER LIMBS**

- Need to:
  - bring hands to above head height and grasp side / manropes.
  - climb up/down using hand grips for assistance in taking body weight and for stability.
  - grasp man-ropes in event of ladder collapse.

- **CRITERIA:** Able to move both shoulders, elbows and hands with sufficient power to achieve all movements described.

**BACK MOVEMENTS**

- Need to:
  - maintain upright posture so as to facilitate use of arms and legs when climbing.
  - bend and turn to climb on to ship or accommodation ladder or onto cutter.

- **CRITERIA:** Able to stabilise spine and to move spine so as to achieve movements described.

**LEG MOVEMENTS**

- Need to:
  - spring from cutter up onto step of ladder with either foot.
  - ascend / descend 9m ladder (plus stairs on ship).
  - step or jump backward from ladder onto unstable wet deck of cutter.

- **CRITERIA:** Able to move legs, knees, ankles and feet with sufficient power to achieve all movements described.
Table 11. Normative data for hand grip strength (in kg) (Australian fitness norms)

<table>
<thead>
<tr>
<th>Percentile - MEN</th>
<th>18-29</th>
<th>30-39</th>
<th>40-49</th>
<th>50-59</th>
<th>60-69</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>34</td>
<td>40</td>
<td>38</td>
<td>36</td>
<td>32</td>
</tr>
<tr>
<td>25</td>
<td>42</td>
<td>46</td>
<td>44</td>
<td>43</td>
<td>37</td>
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<tr>
<td>50</td>
<td>50</td>
<td>51</td>
<td>49</td>
<td>47</td>
<td>41</td>
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<tr>
<td>75</td>
<td>56</td>
<td>57</td>
<td>55</td>
<td>51</td>
<td>46</td>
</tr>
<tr>
<td>95</td>
<td>65</td>
<td>66</td>
<td>61</td>
<td>60</td>
<td>52</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentile - WOMEN</th>
<th>18-29</th>
<th>30-39</th>
<th>40-49</th>
<th>50-59</th>
<th>60-69</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>24</td>
<td>23</td>
<td>23</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>25</td>
<td>29</td>
<td>28</td>
<td>27</td>
<td>25</td>
<td>23</td>
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<tr>
<td>50</td>
<td>30</td>
<td>31</td>
<td>30</td>
<td>29</td>
<td>25</td>
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<tr>
<td>75</td>
<td>34</td>
<td>35</td>
<td>33</td>
<td>32</td>
<td>28</td>
</tr>
<tr>
<td>95</td>
<td>39</td>
<td>40</td>
<td>38</td>
<td>36</td>
<td>34</td>
</tr>
</tbody>
</table>

Patient should be >=50th percentile for age in each hand.


It may be assumed that if a pilot is fit enough to climb ladders they are fit enough for other tasks requiring musculoskeletal capacity such as walking around the bridge or climbing ladders and gangways on wharves at port.

Where a lack of musculoskeletal fitness is found at examination, advice may be given regarding appropriate remedial activity or referral made to an exercise physiologist, sports physician or other suitable practitioner, in conjunction with the pilot’s general practitioner. Pilots should also be encouraged to maintain musculoskeletal fitness through an activity of their choice e.g. gym, swimming, cycling, etc.

10.2.2 Body Mass Index

Height and weight should be measured and BMI calculated using the nomogram below. Some allowance should be made for body composition because very muscular persons may have a high BMI but will be fit and at low risk on the ladder.

Recruitment

Because there is a tendency to gain weight with age, pilots at recruitment should, desirably, have a BMI of ≤ 25 and should not exceed 30.

General management

Pilots should be encouraged to self-monitor their BMI and preferably maintain it in the normal range of ≤ 25.

Periodic assessment

The BMI of pilots should be progressively tracked at Periodic Health Assessments to encourage maintenance of BMI and early detection of untoward trends. Where an untoward trend is detected, possible reasons should be assessed and appropriate advice given or referral made, e.g. for dietetic advice, in discussion with the pilot’s general practitioner.

If the BMI is > 30 (obese) the pilot should be classified Fit Subject to Review and managed appropriately; if the BMI is > 35 the pilot should be classified Temporarily Unfit until the BMI is reduced to satisfactory levels.

Diagram 16. BMI nomogram

10.2.3 Arthritis

Painful joints may arise due to inflammatory or degenerative arthritis. Pilots who have persistent pain and marked reduction in range of movement in shoulders, elbows, wrists, hands, hips, knees, ankles or feet may not meet the criteria.

Opioid derivatives such as codeine or buprenorphine may be used for pain relief for example for low back pain. This legitimate usage of opioid needs to be taken into account when assessing impairment or conducting drug screening. Consideration also needs to be given to possible effects on cognitive functions particularly from prolonged or high doses.

There is no specific advice on assessing this side-effect but desirably a pilot would begin any necessary course on days off and be assessed for alertness prior to working.

10.2.4 Post surgery including joint replacement

Pilots should generally not pilot a ship for six weeks post major orthopaedic surgery. They should then be fully assessed regarding all criteria.

10.2.5 Balance

Agility of movement requires good balance which is assessed using the Romberg test. (Also refer to Balance / Vestibular Disorders, page 55).
### MEDICAL CRITERIA FOR MARINE PILOTS—MUSCULOSKELETAL DISORDERS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Musculoskeletal Disorders</strong></td>
<td>The musculoskeletal activities which are needed for marine piloting are described above. The criteria of <em>Fit for Duty</em> are not met:</td>
</tr>
<tr>
<td></td>
<td>• if the ability to perform the activities described is inadequate. <em>Fit for Duty Subject to Review</em> or <em>Subject to Job Modification</em> may be recommended, taking into account the opinion of a specialist or therapist. A practical assessment may be helpful.</td>
</tr>
<tr>
<td></td>
<td>The pilot may be classed Temporarily Unfit while remedial exercises are undertaken.</td>
</tr>
</tbody>
</table>

### References

11. NEUROLOGICAL DISORDERS

See also Epilepsy (page 82), Syncope (page 107) and Balance/Vestibular disorders (page 55)

11.1 RELEVANCE TO MARINE PILOTS

Neurological disorders may affect the ability to pilot ships due to the effect on high level mental function or the loss of coordination of various body functions when climbing the pilot’s ladder.

11.2 ASSESSMENT AND MEDICAL CRITERIA

Medical criteria for fitness for duty are outlined in the table overleaf.

The pilot with a neurological disorder must be assessed to determine whether the sum of symptoms and signs, being physical, mental and behavourial is compatible with safe pilotage as outlined in the inherent requirements (Part B).

Any impairment of consciousness or awareness, or the presence of confusion or loss of visual fields or vertigo, is usually incompatible with marine piloting. Muscular power and coordination as well as proprioception should be adequate to undertake climbing safely on the pilot’s ladder.

If the health professional is concerned about cognitive function, the opinion of a neuropsychologist may be helpful or testing may be conducted in a simulator (refer to page 18). Physical capacity may be assessed by a physiotherapist / occupational therapist or on a pilot’s ladder rigged-up on land (available at Sydney and Newcastle).

11.2.1 Dementia and other cognitive impairments

The person should not pilot ships if there is significant impairment of memory, visuospatial skills, insight or judgement or if there are problematic hallucinations or delusions. Baseline and frequent periodic review are required as most forms of cognitive impairment and dementia are progressive. Referral to a neuropsychologist or assessment in a simulator may be helpful in cases of cognitive impairment.

11.2.2 Neuro-development disorders

Specialist advice should be sought regarding marine pilots who have complex conditions such as ADHD.

11.2.3 Stroke

In the event of a stroke the pilot should not pilot ships for a minimum of one month post event. Return to marine piloting depends upon careful specialist assessment. Neurological, perceptual or cognitive deficits or a visual field defect will usually exclude a person from marine piloting in accordance with this standard. Predisposing causes of stroke such as berry aneurysms or vascular malformations need to be managed on an individual basis.

11.2.4 Transient ischaemic attacks (TIA)

TIA may recur or be harbingers of a full stroke. Marine pilots who have had only one transient ischaemic episode should be referred to an appropriate specialist to determine their fitness for duty. If an underlying cardiac pathology for such episodes is identified any recommendation for Fit for Duty Subject to Review, would be based upon the prognosis of that condition, and the likelihood of continued recurrence.

11.2.5 Multiple Sclerosis

Multiple Sclerosis may progress to cause poor coordination, fatigue and weakness, vertigo, memory loss, significant cognitive impairment, or visual impairment, any of which may impair capacity to work safely.

11.2.6 Peripheral neuropathy

Peripheral neuropathy may impair working due to difficulties with sensation (particularly proprioception) or severe weakness developing affecting safety on the pilot’s ladder.

11.2.7 Limb control

A loss of control of a limb due to paralysis, paresis or other neurological conditions needs to have the severity assessed on an individual basis. (Refer to Musculoskeletal chapter (page 88) for functional assessment.)

11.2.8 Intracranial surgery

In the event of intracranial surgery the pilot should not pilot ships until cleared by a relevant specialist (neurosurgeon/neurologist). Balance and coordination warrant particular attention. (See also Epilepsy – surgery, page 82).

11.2.9 Head injury

A person who recovers from a loss of consciousness of less than 24 hours with no complications usually does not present any special risk. Similarly, immediate seizures which occur within 24 hours of a head injury are not considered to be epilepsy, but part of the acute process.

Pilots who have had head injuries should not pilot ships immediately afterwards. Balance and coordination warrant particular attention. The occurrence of persisting functional disturbances requires careful assessment to determine fitness for duty. This may include referral to a neurologist, neuropsychological testing and assessment in a simulator.

11.2.10 Migraine and recurrent headache

Attacks of migraine and recurrent headache are common but their frequency and severity vary so each case needs to be assessed on its merits. They may impair a person’s ability to concentrate and to work safely. Pilots who suffer migraine and recurrent headaches should have their symptoms and treatment reviewed. A plan of management if an attack occurs at work should be discussed and agreed with their operator as necessary. Provoking factors such as shift work, lighting and noise may need attention. In severe cases Fit for Duty Subject to Review may be recommended.
### MEDICAL CRITERIA FOR MARINE PILOTS – NEUROLOGICAL DISORDERS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
</table>
| **Berry Aneurysms and other vascular malformations of the brain**         | The criteria for *Fit for Duty* are not met:  
| - if the person has a berry aneurysm or other vascular malformation.      |          |
| *Fit for Duty Subject to Review* may be recommended, taking into account the opinion of an appropriate specialist and the nature of the work:  
| - after consideration of the risk and the benefits of any treatments.    |          |
| **Dementia and other cognitive impairments**                               | The criteria for *Fit for Duty* are not met:  
| - if the person’s dementia or cognitive impairment is confirmed.          |          |
| *Fit for Duty Subject to Review* may be recommended, taking into account the opinion of an appropriate specialist and the nature of the work, and:  
| - the cause of the condition and likely response to treatment; AND        |          |
| - any appropriate neuropsychological tests; AND/OR                       |          |
| - the result of an assessment in a simulator.                             |          |
| **Head injury (Acquired brain injury)**                                    | The criteria for *Fit for Duty* are not met:  
| - if the person has had head injury causing chronic functional disturbances. |          |
| *Fit for Duty Subject to Review* may be recommended, taking into account the opinion of an appropriate specialist and the nature of the work, and:  
| - the result of neuropsychological testing; AND/OR                        |          |
| - the result of an assessment in a simulator; AND                         |          |
| - other disabilities that may impair the marine pilotage task as per this standard. | |
| **Migraine**                                                              | See text. |
| **Neglects (While patient perceives, does not respond appropriately)**   | The criteria for *Fit for Duty* are not met:  
| - if there are neglects present.                                          |          |
| **Neuromuscular conditions (MS, Parkinson’s Disease, Peripheral Neuropathy)** | The criteria for *Fit for Duty* are not met:  
| - if the person has Parkinsonism, multiple sclerosis, degenerative peripheral neuropathy, progressive muscular dystrophy or any other severe neuromuscular disorder. |          |
| *Fit for Duty Subject to Review* may be recommended, if the disability is limited to minor effects on marine piloting, taking into account the opinion of a neurologist or rehabilitation specialist and the nature of the work, and:  
| - the response to treatments;                                              |          |
| - the result of an assessment by an Occupational Therapist / Physiotherapist; |          |
| - modifications to the job, where practical.                             |          |
| **Stroke (Berry aneurysm -- see above)**                                  | The criteria for *Fit for Duty* are not met:  
| - if the person has had a stroke.                                         |          |
| *Fit for Duty Subject to Review* may be recommended, taking into account the opinion of an appropriate specialist and the nature of the work:  
| - if the stroke was caused by a condition that has now been satisfactorily treated. Satisfactory recovery from the stroke, including cognitive, neurological and perceptual deficits, must also be demonstrated. | |
### MEDICAL CRITERIA FOR MARINE PILOTS– NEUROLOGICAL DISORDERS (CONT)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transient Ischaemic Attacks</td>
<td>The criteria for <strong>Fit for Duty</strong> are not met:</td>
</tr>
<tr>
<td></td>
<td>• if the person has had two or more transient ischaemic attacks.</td>
</tr>
<tr>
<td><strong>Fit for Duty Subject to Review</strong></td>
<td>may be recommended, taking into account the opinion of an appropriate specialist and the nature of the work:</td>
</tr>
<tr>
<td></td>
<td>• if the aetiology of the attacks has been identified; AND</td>
</tr>
<tr>
<td></td>
<td>• the underlying cause removed; AND</td>
</tr>
<tr>
<td></td>
<td>• the person has had a six-month period free of attacks.</td>
</tr>
</tbody>
</table>

### Further reading


12. PREGNANCY

12.1 RELEVANCE TO MARINE PILOTS

Pregnancy presents specific issues to be considered regarding pilotage work. As the abdomen distends and alters the centre of gravity it is unlikely most women will retain the ability to climb the pilots ladder safely after 12 weeks. Some women experience fatigue and nausea during the first trimester, which would also make this work unsafe. However the capacity for pilotage work may be unimpaired and if suitable transfers can be arranged (e.g. by helicopter) then work may continue until the last trimester.

Women resuming work after a pregnancy, particularly if there have been complications, should be encouraged to discuss their return to work with the examining doctor. For example, it is important women have fully recovered if there has been extensive blood loss and have their haemoglobin checked prior to undertaking the exertion of climbing ladders. Persistent laxity of the symphysis pubis may impair climbing and there may be a loss of fitness due to prolonged absence from work.

12.2 MEDICAL CRITERIA

It is inadvisable to continue pilotage work involving pilot ladders after 12 weeks for reasons of safety.

Other aspects of the effects of pregnancy should be managed as per any other illness utilising sick leave and maternity leave provisions.
13. **PSYCHIATRIC DISORDERS**  

*See also Neurological Disorders (page 92), Alcohol Dependence and Impairment (page 50) and Drugs – Illicit (page 77).*

13.1 **RELEVANCE TO MARINE PILOTS**

Psychiatric disorders may affect the ability to pilot ships due to effects on cognitive and behavioural functions.

Marine piloting is a complicated psychomotor task which depends on fine coordination between the sensory and motor systems. It is influenced by factors such as arousal, perception, learning, memory, attention, concentration, emotion, reflex speed, time estimation, auditory and visual functions, decision-making and personality. Complex feedback systems interact to produce the appropriate coordinated behavioural response. Anything that interferes with these factors to a significant degree may impair piloting ability. For example, inattentiveness due to a mixture of anxiety arising from a chronic domestic situation and some medications may contribute to accidents.

Good interpersonal skills are required for bridge management. This sometimes requires sensitivity to cultural differences and relating to a ships master and crew with limited English.

13.2 **ASSESSMENT**

During the assessment the examiner will be able to make an overall assessment of the pilot’s mental state. In addition the K10 questionnaire helps assess for anxiety-depression states which are the most common of mental disorders. The use and interpretation of the K10 Questionnaire is outlined on page 98. Fatigue may manifest with non-specific symptoms such as irritability and weariness.

13.3 **MEDICAL CRITERIA**

Medical criteria for fitness for duty are outlined in the table overleaf.

13.3.1 **Psychiatric conditions (depression, anxiety, schizophrenia, bipolar disorder, etc)**

Persons with any significant mental illnesses (whether acute or chronic) should not perform marine piloting work, although recommendation of Fit for Duty Subject to Review may be considered in some circumstances on the recommendation of a treating psychiatrist.

An acute episode of mental illness (for example, psychosis, acute mania or panic attack) poses a substantial risk. Such an episode in a marine pilot would mean the criteria for fitness for duty are not met and the person should be classed Temporarily Unfit for Duty pending further assessment.

Some medications for mental illness may affect alertness and coordination. However, the use of more modern drugs with less side effects (especially atypical antipsychotics) may improve compliance and therefore reduce symptoms. There may need to be a trial period of the medication when the person should be classed Temporarily Unfit for Duty.

13.2.2 **Dementia and other cognitive impairments**  
*see also Neurological Disorders page 92*

The person should not perform piloting duties if there is significant impairment of memory, visuospatial skills, insight or judgement or if there are problematic hallucinations or delusions. Baseline measures and periodic review are required as most forms of cognitive impairment and dementia are progressive. Referral to a neuropsychologist or assessment in a simulator may be helpful in cases of cognitive impairment.

13.2.3 **Personality disorder**

Persons with personality disorders often show disregard for social values and rules. They are unsuitable for marine piloting given the importance of interpersonal skills in bridge management. Persons with unsuitable personality traits/attitudes should be identified by selection (neuropsychological) tests at time of recruitment. Usually this is not a medical or health assessment matter.

13.2.4 **Neuro-development disorders**

Specialist advice should be sought regarding pilots who have complex conditions such as ADHD.

Where a mental health condition is associated with epilepsy or illicit drug use, the relevant section should also be referred to.

13.2.5 **Practical assessment**

Where appropriate a practical assessment may be recommended. This may include referral to a neuropsychologist or assessment in a simulator.
### Part C. Medical Criteria for Marine Pilot Health Assessments

#### MEDICAL CRITERIA FOR MARINE PILOTS– PSYCHIATRIC DISORDERS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>K10 Score</td>
<td>If the person has a K10 score of 19 or greater the person may be classified Temporarily Unfit for Duty or Fit for Duty Subject to Review while the causes are being assessed and managed. Refer to detailed guidance page 98.</td>
</tr>
<tr>
<td>Psychiatric disorders</td>
<td>The criteria for <em>Fit for Duty</em> are not met:</td>
</tr>
<tr>
<td></td>
<td>- if the person has an acute or chronic psychosis, whether schizophrenic, bipolar (manic or depressive phase) or other depressive psychosis; OR</td>
</tr>
<tr>
<td></td>
<td>- if the person has a personality or psychiatric disorder with features such as aggression or violence which are hazardous to pilotage work; OR</td>
</tr>
<tr>
<td></td>
<td>- if the person is taking psychoactive drugs which will impair work performance on a long term basis; OR</td>
</tr>
<tr>
<td></td>
<td>- if the person’s judgement or perceptual, cognitive or motor function is affected by mental disorder (for example, ADHD); OR</td>
</tr>
<tr>
<td></td>
<td>- if the examining doctor believes that there is a significant risk of previous psychotic condition relapsing.</td>
</tr>
<tr>
<td>Fit for Duty Subject to Review</td>
<td>Fit for Duty Subject to Review may be recommended, taking into account the opinion of a psychiatrist and the nature of the work:</td>
</tr>
<tr>
<td></td>
<td>- if the condition is well controlled and the person is compliant with treatment over a substantial period; AND</td>
</tr>
<tr>
<td></td>
<td>- the person is taking medication that minimises the risk of cognitive or other side effects that might affect pilotage work; AND</td>
</tr>
<tr>
<td></td>
<td>- considering the results of any appropriate neuropsychological tests; AND</td>
</tr>
<tr>
<td></td>
<td>- considering the result of an assessment in a simulator, or equivalent if appropriate.</td>
</tr>
</tbody>
</table>
Anxiety / Depression – K10 Questionnaire

In recognition of the potential impact of psychological problems on attentiveness to safety critical work, and the increasing incidence of these problems in the community, the K10, a psychological screening tool is included in the Health Questionnaire for Marine Pilots. The questionnaire aims to identify pilots with significant levels of psychological distress so that they may be appropriately managed with respect to their work and their ongoing health and wellbeing.

The Kessler Psychological Distress Scale (K10) is a scale developed in 1992 by Kessler for use in population surveys. It has been widely used in the United States as well as in Australia, where it has been included in the Australian Survey of Mental Health and Wellbeing (1997) and the Australian National Health Surveys. It has been validated for use in Australia by Professor Gavin Andrews and is available in the public domain.

Research has revealed a strong association between high scores on the K10 and the Composite International Diagnostic Interview (CIDI) diagnosis of anxiety and affective disorders. There is a lesser but significant association between the K10 and other mental disorder categories and with the presence of any current mental disorder (Andrews & Slade, 2001).

Sensitivity and specificity data analysis also supports the K10 as an appropriate screening instrument to identify likely cases of anxiety and depression in the community and to monitor treatment outcomes.

Thus, the K10 is widely recommended as a simple measure of psychological distress and as a means to monitor progress following treatment for common mental health disorders such as anxiety and depression.

The K10 is a screening instrument, thus examining health professionals are required to apply clinical judgement in the interpretation of the score and the action required.

The K10 scale is based on 10 questions about negative emotional states experienced during the 4 week period leading up to the assessment (refer to Table 12).

For each item there is a five-level response scale based on the amount of time the respondent reports experiencing the particular problem. The response options are: none of the time, a little of the time, some of the time, most of the time, and all of the time.

Each item is scored from 1 for ‘none of the time’ to 5 for ‘all of the time’. Scores for the ten items are then summed, yielding a minimum possible score of 10 and a maximum possible score of 50. Low scores indicate low levels of psychological distress and high scores indicate high levels of psychological distress.

Questions 3 and 6 do not need to be asked if the response to the proceeding question was ‘none of the time’. In such cases Questions 3 and 6 will automatically receive a score of one.

Table 12. K10 Questionnaire

<table>
<thead>
<tr>
<th>Please tick the answer that is correct for you:</th>
<th>All of the time (Score 5)</th>
<th>Most of the time (Score 4)</th>
<th>Some of the time (Score 3)</th>
<th>A little of the time (Score 2)</th>
<th>None of the time (Score 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In the past 4 weeks, about how often did you feel tired out for no good reason?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. In the past 4 weeks, about how often did you feel nervous?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. In the past 4 weeks, about how often did you feel so nervous that nothing could calm you down?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4. In the past 4 weeks, about how often did you feel hopeless?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5. In the past 4 weeks, about how often did you feel restless or fidgety?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6. In the past 4 weeks, about how often did you feel so restless you could not sit still?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7. In the past 4 weeks, about how often did you feel depressed?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8. In the past 4 weeks, about how often did you feel that everything was an effort?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>9. In the past 4 weeks, about how often did you feel so sad that nothing could cheer you up?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>10. In the past 4 weeks, about how often did you feel worthless?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Anxiety / Depression - K10 Questionnaire (cont)

Interpreting K10 Scores

The creators of the K10 have not developed or published details on scoring the scale, thus various interpretations of scoring have been used.

The 2001 Victorian Population Health Survey adopted a set of cut-off scores based on how practitioners use the K10 as a screening tool. These scores are outlined in Table 13 and provide a useful overview of how the K10 can be applied for screening purposes in general practice.

Table 13. K10 cut-off scores

<table>
<thead>
<tr>
<th>K10 score</th>
<th>Likelihood of having a mental disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 - 19</td>
<td>Likely to be well</td>
</tr>
<tr>
<td>20 - 24</td>
<td>Likely to have a mild disorder</td>
</tr>
<tr>
<td>25 - 29</td>
<td>Likely to have a moderate mental disorder</td>
</tr>
<tr>
<td>30 - 50</td>
<td>Likely to have a severe mental disorder</td>
</tr>
</tbody>
</table>

2001 Victorian Population Health Survey to estimate the prevalence of levels of psychological distress

National population results based on this scoring system (National Health Survey 2001) are shown in Table 14, indicating that 85.8% of males and 79.6% of females have low levels of psychological distress or are likely to be well with respect to their mental health.

8.3% of males and 10.6% of females are likely to have a mild mental disorder, 3.1% of males and 5.5% of females are likely to have a moderate disorder and 2.7% of males and 4.4% of females are likely to have a severe disorder.

Table 14. National Health Survey 2001 - Level of psychological distress

<table>
<thead>
<tr>
<th>Level of psychological distress (K10 score)</th>
<th>Males%*</th>
<th>Females%*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (10 - 19)</td>
<td>85.8</td>
<td>79.6</td>
</tr>
<tr>
<td>Moderate (20 - 24)</td>
<td>8.3</td>
<td>10.6</td>
</tr>
<tr>
<td>High (25 - 29)</td>
<td>3.1</td>
<td>5.5</td>
</tr>
<tr>
<td>Very High (30 - 50)</td>
<td>2.7</td>
<td>4.4</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* Age standardised percentages.

In defining the cut-off scores for marine pilots, key considerations are the specificity and sensitivity of the test – sensitivity being the measure of a test’s ability to detect an illness and specificity being a measure of a test’s ability to only diagnose those persons who have the condition, not those who do not have it. The aim is to optimise the ability to detect people with the illness whilst limiting the number of false positives.

Table 15 (Andrews and Slade 2001) shows the sensitivity and specificity for the K10 at various scoring levels. A cut-off score of 19 results in a sensitivity of 71% and a specificity of 90% (i.e. 10% incorrect detection). A cut-off score of 20 results in lower sensitivity (86%) and slightly higher specificity. Given the importance of psychological health for safety critical work, the cut-off of 19 with 71% sensitivity has been identified for initiating intervention in these workers albeit with a 10% false positive rate.

Table 15. Sensitivity and specificity of the K10 in identifying people who met CIDI criteria for any current anxiety or affective disorder (prevalence 7.1%)

<table>
<thead>
<tr>
<th>K10 score greater than or equal to</th>
<th>Sensitivity (hit rate)</th>
<th>Specificity (rejection rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>0.94</td>
<td>0.63</td>
</tr>
<tr>
<td>15</td>
<td>0.90</td>
<td>0.72</td>
</tr>
<tr>
<td>16</td>
<td>0.86</td>
<td>0.78</td>
</tr>
<tr>
<td>17</td>
<td>0.81</td>
<td>0.83</td>
</tr>
<tr>
<td>18</td>
<td>0.77</td>
<td>0.87</td>
</tr>
<tr>
<td>19</td>
<td>0.71</td>
<td>0.90</td>
</tr>
<tr>
<td>20</td>
<td>0.66</td>
<td>0.92</td>
</tr>
<tr>
<td>21</td>
<td>0.60</td>
<td>0.94</td>
</tr>
<tr>
<td>22</td>
<td>0.55</td>
<td>0.95</td>
</tr>
<tr>
<td>23</td>
<td>0.50</td>
<td>0.97</td>
</tr>
<tr>
<td>24</td>
<td>0.45</td>
<td>0.97</td>
</tr>
<tr>
<td>25</td>
<td>0.41</td>
<td>0.98</td>
</tr>
<tr>
<td>26</td>
<td>0.36</td>
<td>0.98</td>
</tr>
<tr>
<td>27</td>
<td>0.33</td>
<td>0.99</td>
</tr>
<tr>
<td>28</td>
<td>0.31</td>
<td>0.99</td>
</tr>
<tr>
<td>29</td>
<td>0.27</td>
<td>0.99</td>
</tr>
<tr>
<td>30</td>
<td>0.24</td>
<td>0.99</td>
</tr>
<tr>
<td>31</td>
<td>0.21</td>
<td>1.00</td>
</tr>
<tr>
<td>32</td>
<td>0.16</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Use of the K10 for marine pilots

The purpose of applying the K10 to safety critical workers such as marine pilots is to screen for mental health disorders that may affect attentiveness and thus the ability to perform safety critical work. The examining health professional is required to evaluate the responses to the questionnaire in conjunction with supporting information provided by the organisation, such as absenteeism and accident history, which may provide indications of a mental health problem. The examining health professional should also form a clinical impression of the patient and consider if this is consistent with the score on the K10.
Part C. Medical Criteria for Marine Pilot Health Assessments

Anxiety / Depression - K10 Questionnaire (cont)

The examining health professional may also feel it is appropriate to make contact with a pilot’s general practitioner to discuss their history. Based on these inputs the examining health professional will form a view as to whether they believe there is a significant current risk that the pilot might be impaired at work.

Administering the K10

In the marine pilot health assessment, the K10 questionnaire is administered in a self-report format, however it can also be administered by interview if necessary.

The cognitive capacities (e.g. literacy, forgetfulness) and the level of cooperation or defensiveness of the pilot should be considered in selecting the appropriate format.

Dishonest completion may be an issue, so review of the responses with the pilot is desirable, as is consideration of the overall clinical picture. It may be helpful to reassure the pilot that all responses are confidential and are not forwarded to the operator.

Scoring the K10 and managing safety critical workers

As indicated above, a total score of 50 is possible.

Higher scores indicate a greater likelihood of mental disorder and a need for more intensive treatment.

Table 16 provides a guide for management of marine pilots according to their K10 score. Examining health professionals should also consider supporting information such as accident/incident history and sick leave, as well as the clinical examination when selecting the appropriate intervention.

As a general rule, patients who rate most commonly ‘Some of the time’ or ‘All of the time’ categories are in need of a more detailed assessment, and may not be fit to continue safety critical work.

Pilots who rate most commonly ‘A little of the time’ or ‘None of the time’, generally do not require further assessment, however the clinical examination may indicate otherwise and will guide the final decision in this regard.

It is important to note that high scores may be the result of acute distress brought on by domestic or work stress, or may be due to endogenous causes. Interventions appropriate to the particular situation will therefore need to be identified.

Where work stress is identified as a factor in a raised score, the examining health professional is in a good position to constructively intervene and advise on remedial steps regarding work load, job re-organisation, training, conflict resolution, etc.

Risk Zone I — K10 scores between 10 and 19

Scores below 19 indicate that the pilot is likely to be well but should be considered in the context of the overall clinical impression of the patient.

Although no formal intervention is required, reference to the importance of mental health for safety critical work is appropriate. Information and resources may also be provided to highlight symptoms and sources of support.

Risk Zone II — K10 scores between 19 and 24

Scores in this zone indicate that the pilot is likely to have a mild disorder (specificity greater than 90%). The examining health professional should explore possible reasons including domestic or work stress and provide brief counselling as required. The examining health professional should identify sources of support or guidance that may be helpful to the pilot including work-based employee assistance programs; community support services or the pilot’s general practitioner.

The examining health professional may assess the pilot as Fit Subject to Review in order to flag the issue for attention at subsequent assessments. The period of review may be earlier or in line with normal periodic frequencies, depending on the clinical assessment and other indicators.

Risk Zone III — K10 scores between 25 and 29

This zone indicates the pilot is likely to suffer from a moderate mental disorder (specificity greater than 98%).

Again, the examining health professional should explore possible reasons and consider the supporting information and clinical picture.

Pilots in this zone should be managed by a combination of brief counselling, referral to the pilot’s general practitioner and continued monitoring.

The examining health professional may assess the pilot as Fit Subject to Review and should refer for external assessment via the pilot’s general practitioner. Alternatively, the examining health professional may classify the pilot as Temporarily Unfit if there are immediate concerns for safe marine piloting.

Risk Zone IV — K10 scores equal to or greater than 30

Scores in this zone indicate that the pilot is likely to have a severe mental disorder (specificity greater than 99%).

They should be assessed as Temporarily Unfit for Duty pending further assessment and referred in the first instance to their general practitioner.
### Table 16. K10 risk levels and interventions

<table>
<thead>
<tr>
<th>Risk Levels</th>
<th>K10 Score</th>
<th>Intervention</th>
<th>Assessment conclusion for SCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone I</td>
<td>10 - 18</td>
<td>No formal intervention. Consider the consistency of the clinical impression with the score. General advice about the importance of mental health for safety critical work and alert to further information and resources.</td>
<td>Fit for Duty</td>
</tr>
<tr>
<td>Zone II</td>
<td>19 - 24</td>
<td>Brief counselling and reference to self-help materials and support services as applicable to the situation.</td>
<td>May be assessed Fit Subject to Review. Review period may be in line with normal periodic review periods or more frequent if situation warrants it.</td>
</tr>
<tr>
<td>Zone III</td>
<td>25 - 29</td>
<td>Brief counselling, referral to general practitioner and continued monitoring.</td>
<td>May be assessed Fit Subject to Review or Temporarily Unfit depending on situation. Review period will depend on the individual situation.</td>
</tr>
<tr>
<td>Zone IV</td>
<td>30 - 50</td>
<td>Refer for diagnostic evaluation and treatment. Review as appropriate.</td>
<td>Should be assessed Temporarily Unfit for Duty while being evaluated and while treatment initiated. Return to work will depend on effectiveness of treatment.</td>
</tr>
</tbody>
</table>

### References

14. RESPIRATORY DISEASES AND SPEECH

See also VO₂ max page 58.

14.1 RELEVANCE TO MARINE PILOTS

Respiratory disease may affect the ability of pilots to perform their work safely. Good respiratory function is essential to meet the oxygen demands associated with climbing the pilot’s ladder and stairs on ships and not be exhausted on reaching the bridge.

Clear speech is required for communication particularly by radio-communication systems.

14.2 ASSESSMENT

Medical criteria for fitness for duty are outlined in the following table.

Cardiorespiratory function is assessed using a test of VO₂ max. The test method and criteria to be applied are outlined in the Cardiovascular chapter (page 58).

14.3 MEDICAL CRITERIA

Chronic respiratory disease (asthma, COPD, etc) of any severity is not compatible with marine piloting. A pilot’s duties require not only working on the bridge, but also using the pilot’s ladder with high respiratory demands. The severity should be assessed using VO₂ max test and criteria.

Careful assessment of the ability to perform pilot work is warranted in cases of chronic respiratory disease. Severe disease is incompatible with the respiratory demands. Mild, well-controlled disorders should be assessed regarding (or equivalent measure of work capacity) and may be classed Fit Subject to Review.

14.3.1 Laryngectomy and tracheostomy

Persons with a tracheostomy or laryngectomy are unsuitable for pilotage. The work requires the ability to speak clearly and quickly including use of radio-communications as well as high respiratory demands.

14.3.2 Speech

Assessment of a speech impediment arising from conditions such as cleft palate, facial trauma, etc, (similar to that in association with a foreign accent) is not a medical matter. It should be assessed as part of general competencies by the operator (refer to Marine Pilotage Code competencies).

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic respiratory disease (e.g. asthma, COPD)</td>
<td>The criteria for <strong>Fit for Duty</strong> are not met;</td>
</tr>
<tr>
<td></td>
<td>• if the pilot has chronic respiratory disease.</td>
</tr>
<tr>
<td></td>
<td><strong>Fit for Duty Subject to Review</strong> may be recommended if the condition is well controlled and the VO₂ max reaches the criteria.</td>
</tr>
<tr>
<td>Laryngectomy and Tracheostomy</td>
<td>The criteria for <strong>Fit for Duty</strong> are not met:</td>
</tr>
<tr>
<td></td>
<td>• post laryngectomy or tracheostomy.</td>
</tr>
<tr>
<td>VO₂ max</td>
<td>Refer to <em>Cardiovascular</em>, page 57.</td>
</tr>
</tbody>
</table>

References

15. SLEEP DISORDERS

15.1 RELEVANCE TO MARINE PILOTS

Excessive sleepiness during the day, which manifests itself as a tendency to doze at inappropriate times when intending to stay awake, can arise from many causes and is associated with an increased risk of inattentiveness and accidents.

There are no studies of sleep disorders in marine pilots. However relevant studies have shown an increased rate of motor vehicle accidents two to seven times that of control subjects in those with sleep apnoea9-13. Studies have also demonstrated increased objectively measured sleepiness while driving (electroencephalography and eye closure measurements) and impaired driving simulator performance in sleep apnoea patients3, 14, 15. This performance impairment is similar to that seen due to illegal alcohol impairment or sleep deprivation16.

By inference marine pilots with severe sleep disordered breathing (respiratory disturbance index greater than 34) may have a much higher rate of accidents than those with a less severe sleep disorder17 (LOE-III-2).

Drivers with narcolepsy also perform worse than control subjects on simulated driving tasks and are more likely to have accidents28, 29. (LOE-III-2).

A number of medical sleep disorders may cause excessive daytime sleepiness, including the sleep apnoea syndromes (obstructive sleep apnoea, central sleep apnoea and nocturnal hypoventilation), periodic limb movement disorder, circadian rhythm disturbances (for example, advanced or delayed sleep phase disorder, circadian rhythm disturbances), some forms of insomnia and narcolepsy. Such sleep disorders may affect the ability to pilot ships due to sleepiness per se and/or altered blood gases and hypoxia affecting mental function.

15.2 CAUSES OF INCREASED SLEEPINESS

The causes of excessive daytime sleepiness are diverse and include sleep disorders, other medical conditions and work-sleep imbalance (fatigue) which requires clinical judgement in assessment and management.

15.2.1 Sleep apnoea

Sleep apnoea is present on overnight monitoring in 9% of adult women and 24% of adult men4, 5. Sleep apnoea syndrome (excessive sleepiness in combination with sleep apnoea on overnight monitoring) is present in 2% of women and 4% of men.

Obstructive sleep apnoea involves repetitive obstruction to the upper airway during sleep, precipitated by relaxation of the dilator muscles of the pharynx and tongue, and/or narrowing of the upper airway, and resulting in cessation (apnoea) or reduction (hypopnoea) of breathing.

Central sleep apnoea refers to a similar pattern of cyclic apnoea or hypopnoeas caused by oscillating instability of respiratory neural drive, and not due to upper airways factors. This condition is less common than obstructive sleep apnoea and is associated with cardiac or neurological conditions or may be idiopathic. Hypoventilation associated with chronic obstructive pulmonary disease or chronic neuromuscular conditions may also interfere with sleep quality causing excessive sleepiness.

Common indicators of the possibility of sleep apnoea include habitual snoring during sleep, witnessed apnoeic events, falling asleep inappropriately (particularly during non-stimulating activities) and feeling tired despite adequate time in bed7. Poor memory and concentration, morning headaches and insomnia may also be presenting features. The condition is more common in men and with increasing age.

Physical features commonly found in those with sleep apnoea include obesity, a thick neck and a narrow oedematous (‘crowded’) oropharynx. Sleep apnoea may be present without these features however. Specific questioning in relation to each of the clinical disorders, for example, snoring, witnessed apneas, limb jerking, or cataplexy will focus on the likelihood of a specific sleep disorder.

Treatment of obstructive sleep apnoea with nasal continuous positive airways pressure (CPAP) has been shown to reduce daytime sleepiness and reduce the risk of accidents back to control levels8, 10, 18, 19. CPAP has also been shown to improve driving simulator performance to control levels20. Mandibular advancement splints have also been used to treat obstructive sleep apnoea. While they reduce daytime sleepiness and improve vigilance, studies have not been performed to assess whether they reduce motor vehicle accident rates21-24. (LOE-III-2)

15.2.2 Narcolepsy

Narcolepsy is present in 0.05% of the population and usually starts in the second or third decade of life21. Sufferers present with excessive sleepiness and can have periods of sleep with little or no warning of sleep onset. Other symptoms include cataplexy, sleep paralysis and vivid hypnagogic hallucinations20, 22. The majority of sufferers are HLA-DR2 positive. There is a sub-group of individuals who are excessively sleepless, but do not have all the diagnostic features of narcolepsy. Inadequate warning of oncoming sleep, and cataplexy puts marine pilots at high risk.

Diagnosis of narcolepsy is made on the combination of clinical features, HLA typing and multiple sleep latency test (MSLT) with a diagnostic sleep study on the prior night to exclude other sleep disorders and aid interpretation of the MSLT29, 31.
15.2.4 Fatigue

Part C. Medical Criteria for Marine Pilot Health Assessments

15.2.3 Other medical conditions

Illness, page 44). There are no criteria for diagnosing or managing fatigue. Each case needs to be assessed and managed on its merits (refer to Undifferentiated Fatigue. There are no criteria for diagnosing or managing fatigue. Each case needs to be assessed and managed on its merits (refer to Undifferentiated Fatigue). These factors may increase the severity of sleep disorders and result in more severe sleepiness in pilots with sleep disorders.

Where other medical factors are found to be a factor in excessive daytime sleepiness they will need to be managed on their own merits as well as the sleepiness.

15.2.4 Fatigue

The various non-specific symptoms of fatigue include feeling tired, drained or exhausted sometimes with an associated loss of alertness, poor judgement and irritability. Sleepiness is not necessarily a feature. Fatigue is often associated with work-sleep imbalance. It may arise in conjunction with the demands of irregular work hours and (belt) rosters over the years. Pilots often have records of their rosters which may help in diagnosis and management (if job modification is required). There are no criteria for diagnosing or managing fatigue. Each case needs to be assessed and managed on its merits (refer to Undifferentiated Illness, page 44). Fatigue management programs typically involve attention to rosters and sensible financial rewards, as well as education about the importance of sleep, sleep hygiene including adequate facilities for sleeping, and advice on diet and alcohol use and medication

15.3 ASSESSMENT AND MEDICAL CRITERIA

Determining sleepiness as a disorder is a clinical decision. Subjective measures include tools such as the Epworth Sleepiness Scale, which is incorporated into the Marine Pilot Health Questionnaire.

The ESS is used as a screening tool for excessive daytime sleepiness; it is not a diagnostic tool. The ESS is scored by summing the numeric values in the boxes in the questionnaire; the maximum possible is 8 x 3 = 24. A score of 0 to 10 is within the normal range. Mild to moderate self reported sleepiness (Epworth Sleepiness Scale score of 11 to 15) may be associated with a significant sleep disorder, although the degree of increased risk of sleepiness-related (motor vehicle) accidents is unknown.

Scores of 16 to 24 are consistent with moderate to severe sleepiness and are associated with an increased risk of sleepiness related motor vehicle accidents (odds ratio 15.2)1. (LOE-III-2) If the score is raised (>15) or other clinical findings warrant it, discuss the findings with the pilot to determine possible explanations such as rosters or sleep disorders and agree an approach to management e.g. referral to general practitioner, referral to sleep clinic for polysomnography, or a letter to management about rosters, etc.

In most cases the pilot will need to be immediately classed Temporarily Unfit for Duty pending further assessment. Appropriate referral to an ENT surgeon should be made. Assessment of sleepiness should be made and objective measurement of sleepiness should be considered (maintenance of wakefulness test and/or multiple sleep latency test), particularly if there is concern regarding persisting sleepiness or treatment compliance.

Marine pilots who are diagnosed with obstructive sleep apnoea syndrome and require treatment are required to have annual review by a sleep specialist to ensure that adequate treatment is maintained.

15.4 GENERAL MANAGEMENT

Pilots suspected of having, or found to have, sleep apnoea or other sleep disorders, should be warned about potential impact on marine piloting. General advice should include:

- allowing adequate time for sleep;
- avoiding working after having missed a large portion of their normal sleep;
- complying with treatment including management of lifestyle factors;
- avoiding alcohol and sedative medications;
- resting if sleepy; and
- discussing roster arrangements with the port operator.

For pilots who are treated with CPAP it is recommended that they should use CPAP machines with a down-loadable usage meter to allow objective assessment and recording of treatment compliance.

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The Epworth Sleepiness Scale is under copyright to Dr Murray Johns 1991-1997. It may be used by individual doctors without permission, but use on a commercial basis must be negotiated. It is included in the Marine Pilot Health Assessment Questionnaire.
### MEDICAL CRITERIA FOR MARINE PILOTS– SLEEP DISORDERS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
</table>
| **ESS Score** | The criteria for *Fit for Duty* are not met:  
- if the person has a ESS score of 16 or greater.  
The person will be classified *Temporarily Unfit for Duty* while the causes are being assessed and managed. |
| **Sleep Apnoea Syndrome** | The criteria for *Fit for Duty* are not met:  
- if the person has established sleep apnoea syndrome (sleep apnoea on a diagnostic sleep study and excessive daytime sleepiness) with moderate to severe sleepiness; OR  
- if there is a history suggestive of sleep apnoea in association with severe daytime sleepiness.  
Severe sleepiness is indicated by frequent self-reported sleepiness while working, incidents such as motor vehicle crashes caused by inattention or sleepiness, or an Epworth Sleepiness Scale Score of 16 to 24.  
(LOE-III-2)  
*Fit for Duty Subject to Review* may be recommended, taking into account the opinion of a specialist in sleep disorders and the nature of the work, if treatment is satisfactory.  
(LOE-IV)  
- Compliance with CPAP therapy should be assessed using devices that record usage of the machine and this data should be reviewed periodically; AND  
- Pilots should be subject to at least annual review. |
| **Narcolepsy** | The criteria for *Fit for Duty* are not met:  
- if narcolepsy is confirmed.  
(LOE-III-3)  
*Fit for Duty Subject to Review* may be recommended, taking into account the opinion of a specialist in sleep disorders, and the nature of the work, after the following requirements are met:  
- a clinical assessment has been made by a sleep physician or neurologist; AND  
- cataplexy has not been a feature in the past; AND  
- medication is taken regularly; AND  
- there has been an absence of symptoms for six months; AND  
- normal sleep latency present on MWT (on or off medication).  
(Expert Opinion) AND  
- subject to at least annual review. |
| **Other causes of excessive daytime sleepiness and fatigue.** | See guidelines in text |

### References
1. Guidelines for Managing Heavy Vehicle Driver Fatigue, NTC.  
   Aug 2007
   Washington.  
   p. 1-85.
3. Hakkak, H., et al., *Blink duration as an indicator of driver sleepiness in professional bus drivers*.  
   Sleep, 1999.  
5. Young, T., et al., *The occurrence of sleep-disordered breathing among middle-aged adults [see comments]*.  
   Sleep Research, 1997.  
   26: p. 421.
   Sleep, 2000.  
    Accident Analysis & Prevention, 2001.  
    Cooperative Group Burgos–Santander [see comments].  
Part C. Medical Criteria for Marine Pilot Health Assessments

Further reading


Hock, M.A., et al., Comparison of the effects of sleep deprivation, alcohol and obstructive sleep apnoea (OSA) on simulated steering performance, Respiratory Medicine, 95(7), 594-601, 2001.
16. SYNCOPE / BLACKOUTS
See also Syncope/Cardiac (page 72), Hypoglycaemia (page 74), Transient Ischaemic Attacks (page 92), Epilepsy (page 82).

16.1 RELEVANCE TO MARINE PILOTS
Unpredictable, spontaneous loss of consciousness is incompatible with piloting ships and climbing ladders. Syncope/blackout episodes may arise from various causes including:

- cardiac (for example, arrhythmias, flow obstruction);
- hypotension due to inappropriate vasodilation (for example, vasovagal faints, autonomic system disorder);
- neurogenic (for example, epilepsy, transient ischaemic attacks);
- metabolic (for example, hypoglycaemia);
- psychiatric (for example, hyperventilation, psychosomatic states); or
- unknown.

The prognosis with regard to death (collapse) varies between the causes of syncope. The vasovagal group has a benign prognosis whereas cardiac causes have a doubling of risk and patient with neurologic or unknown causes are at intermediate risk. Treatment may modify this risk but requires expert opinion regarding efficacy.

16.2 ASSESSMENT AND MEDICAL CRITERIA
Determination of the cause of syncope/blackout may be difficult and may require extensive investigations and referral to several specialists. Some of these conditions are temporary (for example, fainting in hot weather) and do not impact on fitness for duty. However, in the event of an unexplained episode of syncope/blackouts consideration must be given to discontinuation of marine piloting until the cause is ascertained and treated.

Where a firm diagnosis has been made, the criteria appropriate to the condition should be referred to in this standard. Where the cause cannot be determined and hence treatment cannot be instituted the pilot should be excluded and classed permanently unfit due to increased risk of collapse. However the area is complex and allowance may be made for specialist opinions after at least six months exclusion.

Table 17 summaries the criteria, including non-piloting periods for the range of conditions potentially associated with blackouts/syncope.

### MEDICAL CRITERIA FOR MARINE PILOTS – SYNCOPE/BLACKOUTS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syncope</td>
<td>Diagnosed and treatable causes should be managed as per relevant chapters (see Table 17). The criteria for <strong>Fit for Duty</strong> are not met:</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- If the person suffers from unexplained syncope/blackouts. <strong>Fit Subject to Review</strong> may be considered after six months in the light of specialist opinion and subject to regular review.</td>
</tr>
</tbody>
</table>

Table 17. Management of blackout / sudden loss of consciousness

<table>
<thead>
<tr>
<th>Cause</th>
<th>Exclusion/nonworking period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac and hypotension (refer to page 72 )</td>
<td>At least 3 months</td>
</tr>
<tr>
<td>Diabetes – hypoglycaemia (refer to page 74 )</td>
<td>At least 3 months</td>
</tr>
<tr>
<td>Epilepsy – general requirements (refer to page 84)</td>
<td>5 years (seizure free)</td>
</tr>
<tr>
<td>Psychiatric (refer to page 96)</td>
<td>At least 3 months</td>
</tr>
<tr>
<td>Transient Ischaemic Attacks (refer to page 92)</td>
<td>6 months (attack free)</td>
</tr>
<tr>
<td>Seizure – initial isolated (not synonymous with epilepsy) (refer to page 83)</td>
<td>1 year (seizure free)</td>
</tr>
<tr>
<td>Syncope unexplained (see above)</td>
<td>6 months</td>
</tr>
</tbody>
</table>

References
17. VISION AND EYE DISORDERS

17.1 RELEVANCE TO MARINE PILOTS

Good vision is essential to pilotage. The pilot is required to accurately see objects at near, intermediate and far distances. They require a full field of vision to detect other approaching ships, etc early. Pilots work at night and may be subject to extremes of darkness and light around docks; therefore good dark adaptation is required.

Good colour vision is needed for maritime navigation which requires accurate recognition of red, green and other coloured lights on other ships and navigation lights on sea and land at night. Accurate recognition of a red or a green light on another vessel gives information regarding its course and the likelihood of a collision. Good acuity is required for good colour vision because poor visual acuity spreads the light on the retina making recognition of small or distant signal lights more difficult.

A significant defect in any of these aspects of a pilot’s visual capacities may endanger the pilotage.

17.2 ASSESSMENT AND MEDICAL CRITERIA

Medical criteria for fitness for duty are outlined in the table on page 109.

There may be a degree of flexibility allowed at the optometrist’s or ophthalmologist’s discretion for individuals who barely meet visual criteria but who are otherwise alert and have normal reaction times.

The important aspects of vision in relation to marine piloting are visual acuity, visual fields and colour vision.

17.2.1 Visual acuity (near and far)

For the purposes of this standard, visual acuity may simply be defined as the best obtainable vision with or without glasses or contact lenses. Visual acuity initially should be measured with one eye occluded and without correction. If correction is normally used when working then vision should be retested with corrective lenses and the corresponding results recorded. Acuity should be tested using an appropriate visual acuity chart (Snellen Chart or equivalent).

Near vision is tested for both eyes without correction in the first place and then retested with correction if worn. Testing should be at N8 of a Times Roman chart placed at 40cm distance. The text should be read fluently.

The visual acuity standard can be met with or without corrective spectacle lenses or contact lenses. Persons who require glasses to perform duties should be classed as Fit for Duty conditional upon wearing corrective lenses and periodic review. If pilots meet the criteria with corrective lenses they should be able to be passed by the Authorised Health Professional without reference to an ophthalmologist, optometrist or general practitioner. In appropriate circumstances a referral may be made.

NOTE: In the case of corneal surgery, corneal pathology or a cataract, acuity should be assessed with a dilated pupil in the presence of a glare source.

NOTE: It is not required that pilots with glasses carry spare sets of glasses at work. However when glasses are worn they should have a neckband to avoid loss. Persons who wear contact lenses must carry a spare set of glasses in case a foreign body enters the eye (so requiring removal of the lens).

Where glasses are prescribed the prescriber should take into account the need for vision at near, intermediate and far distances and consider multi-focal or bifocal lenses.

Polaroid lenses may adversely interact with polaroid glass on some bridge windows or certain flat screen displays and distort images. They should not be prescribed for use on the bridge.

The examining doctor will need to convey the above information to the ophthalmologist or optometrist if a pilot is referred for assessment.

17.2.2 Visual fields

Adequate visual fields are important for marine piloting.

Visual fields may be reduced as a result of head trauma, brain tumour, stroke or cerebral infarction, etc.

Visual field losses also occur in eye diseases such as retinitis pigmentosa, a not uncommon inherited degeneration of the retina that causes significant visual field loss by the age of 30.

Conditions such as glaucoma, optic atrophy, retinal detachment and localised retinal or choroidal infection, and laser treatment of diabetic retinopathy can also reduce visual fields.

Good rotation of the neck may also be necessary to ensure adequate overall fields of vision. (Refer to Musculoskeletal Disorders).

Visual fields may be initially screened by confrontation. Any person who has or is suspected of having a visual field defect should be referred for expert assessment by an optometrist or ophthalmologist. The binocular visual fields should be documented using an automated perimeter or Goldman perimeter.

Binocular vision is required for all marine piloting.

17.2.3 Dark adaptation

Health professionals may wish to recommend restrictions on pilots who appear to meet the visual criteria in the clinical setting but may, in certain environments have extreme difficulty. Certain disorders or diseases such as retinitis pigmentosa can cause poor night vision.

Examples of such restrictions might be daylight piloting only. Specialist referral may be considered.
17.2.4 Progressive eye conditions
Pilots with a progressive eye condition such as cataract, glaucoma, diabetic retinopathy, optic neuropathy and retinitis pigmentosa should be counselled that their eye condition will or may progress to a stage where they are no longer able to work. They should be encouraged to consider making lifestyle changes in anticipation of not being able to work. Their vision should be monitored regularly. Because persons with cataract suffer loss of contrast sensitivity and greater sensitivity to glare, they may have more difficulty seeing when working than is indicated by their visual acuity.

17.2.4 Short-term eye conditions and eye treatments
Persons whose vision is temporarily disturbed by a short term eye condition or an eye treatment should be counselled not to pilot ships for a specified time or to limit their work during this time. This includes temporary patching of any eye, the use of mydriatics or drug known to affect vision, and after eye surgery. They should be classed as Temporarily Unfit for Duty.

17.2.5 Congenital and Acquired Nystagmus
The criteria for visual acuity must be met and any underlying condition fully assessed.

17.2.6 Diplopia
Pilots suffering from all forms of diplopia generally are unsafe to pilot ships and climb ladders. Any person who reports or is suspected of experiencing diplopia should be referred for expert assessment by an optometrist or ophthalmologist. They should be classed as Temporarily Unfit for Duty pending review.

17.2.7 Colour vision
Colour vision should be first assessed with the Ishihara plates. No coloured lenses or sunglasses should be worn. A pass is no more than 3 errors in 12 screening plates of the 24 plate edition (Colour Vision Normal). In the event of a fail the person may be further assessed using the Holmes Wright Lantern Type B5. (For details of Lantern test refer overleaf). These lanterns may be available at specialised clinics or at university departments of optometry.

### MEDICAL CRITERIA FOR MARINE PILOTS– VISION AND EYE DISORDERS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
</table>
| Acuity (far) | Far visual acuity should be measured one eye at a time (monocularly), without correction. Acuity should be tested using a standard visual acuity chart (Snellen Chart or equivalent) that includes at least five letters on the 6/6 and 6/18 lines. More than two errors in reading the letters of any line is regarded as a failure to read the line. The criteria for Fit for Duty are not met:  
* if the person's visual acuity is worse than 6/6 in the better eye; OR  
* if the person's visual acuity is worse than 6/18 in either eye.  
Fit for Duty Subject to Review may be recommended:  
* if the standard is met with corrective lenses (if the standard is met with corrective lenses, fitness for duty is conditional upon wearing these lenses – Fit for Duty Conditional); AND  
* after consideration of the stability of any underlying disorder.  
Fit for Duty Subject to Review may be recommended, taking into account the opinion of an ophthalmologist or optometrist:  
* if the person's vision is worse than 6/18 in the worse eye, provided that the visual acuity in the better eye is 6/6 or better (with or without corrective lenses); AND  
* after consideration of the nature of any underlying disorder.  
In cases of latent nystagmus made manifest by the occlusion of one eye for the purpose of testing, a binocular visual acuity of 6/6 is acceptable if the visual acuity of the better eye is below 6/6 with occlusion of the fellow eye. The same minimum standard of vision in the worse eye applies. |
| Acuity (near) | Near vision should be measured without correction in the first place but using both eyes. The Times-Roman chart should be used at 40 cm. It should be read fluently to pass. The criteria for Fit for Duty are not met:  
* if the near vision is worse than N8 at 40cm  
Fit for Duty Subject to Review may be recommended;  
* if the standard is met with corrective lenses; AND  
* after consideration of the underlying disorder |
<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diplopia</td>
<td>The criteria for <strong>Fit for Duty</strong> are not met:</td>
</tr>
<tr>
<td></td>
<td>- if the person experiences any diplopia (other than physiological diplopia) when fixating objects within 20° of the primary direction of gaze.</td>
</tr>
<tr>
<td>Night blindness (Dark adaptation)</td>
<td>No specific criteria. Refer general management guidelines in text (Dark Adaptation).</td>
</tr>
<tr>
<td>Visual Fields</td>
<td>Visual fields may be initially screened by confrontation. Any person who has or is suspected of having a visual field defect should be referred for expert assessment by an optometrist or ophthalmologist. (Refer to text for details of testing).</td>
</tr>
<tr>
<td></td>
<td><strong>Fit for Duty Subject to Review</strong> may be recommended, taking into account the opinion of an ophthalmologist or optometrist, and the nature of the work:</td>
</tr>
<tr>
<td></td>
<td>- if the binocular visual field has an extent of at least 140° within 20° above and below the horizontal midline; <strong>AND</strong></td>
</tr>
<tr>
<td></td>
<td>- if the person has no significant visual field loss (scotoma, hemianopia, quadrantanopia) that is likely to impede work performance; <strong>AND</strong></td>
</tr>
<tr>
<td></td>
<td>- after consideration of the stability of any underlying disorder.</td>
</tr>
<tr>
<td>Colour vision</td>
<td>Colour vision should be screened using Ishihara plates. 4 or more errors in the 12 screening plates of the 24 plate edition is a fail. The person may be further assessed using Holmes Wright Lantern Type B (Refer to text for details of testing).</td>
</tr>
<tr>
<td></td>
<td>The criteria for <strong>Fit for Duty</strong> are not met:</td>
</tr>
<tr>
<td></td>
<td>- if the person is a significant protan or deutan as determined by the Holmes Wright Lantern test.</td>
</tr>
</tbody>
</table>
Test Procedure for the Holmes-Wright Lantern Type B

1. The examiner should have normal colour vision, and, prior to becoming an examiner using the Holmes-Wright Lantern Type B, have undergone a test using the Lantern as an observer.

2. The observer should wear his or her normal distance correction (glasses or contact lenses). This must be in untinted form.

3. The test is carried out in a dark room.

4. The observer is allowed 10 minutes to adapt to darkness.

5. The observer views the lantern at 6 metres, via a mirror if necessary.

6. Explain to the observer that in the first phase of the test he or she will be shown single lights which will be RED, WHITE or GREEN.

7. Set the selector switch on the back of the Lantern to large aperture. Move the selector slide on the side of the Lantern to show the following numerical codes in the window:
   - Code: 15 Say: "This is RED",
   - Code: 00 Say: "This is WHITE"
   - Code: 33 Say: "This is GREEN".

8. With the selector switch on the back of the Lantern still set on large aperture, show the observer codes 50 through 17 for about 5 seconds each by moving the selector slider to the right (ie clockwise) and ask him or her to name the colours. Record the responses.

9. Explain to the observer that in the second phase of the test he or she will be shown pairs of lights which will be any combination of RED, WHITE or GREEN. Say that he or she will be asked to name the colours of the pairs of lights, with the colour of the left light being given first and then the right light. Record the responses.

10. Set the selector switch on the back of the Lantern to small aperture. Move the selector slide on the side of the Lantern to show the following numerical codes in the window:
    - Code: 00 Say: "This is WHITE, WHITE"
    - Code: 33 Say: "This is GREEN, GREEN"
    - Code: 55 Say: "This is RED, RED",
    - Code: 50 Say: "This is WHITE, RED"
    - Code: 01 Say: "This is GREEN, WHITE"
    - Code: 15 Say: "This is RED, GREEN".

11. With the selector switch on the back of the Lantern still set on large aperture, show the observer the following sequences of the possible 9 pairs in order, each for about 5 seconds;
    - Codes 50 through 17 moving the slide selector to the right (ie clockwise)
    - Codes 17 through 50 moving the slide selector to the left (ie anticlockwise)
    - Codes 50 through 17 (i.e. clockwise)
    - Codes 17 through 50 (i.e. anticlockwise)
    Record the responses.

12. With the selector switch on the back of the Lantern still set on small aperture, show the observer the 9 pairs in random order, each for about 5 seconds. Record the responses.

13. If the observer misnames either or both colours in a pair, it is considered a single error.

14. Add the total number of errors on the 5 runs of 9 pairs of small aperture lights. (Disregard the errors on the large aperture lights.)

15. A total of 5 or less errors is considered a pass of the test.

16. Inform the observer of the result of the test, giving him or her the opportunity to repeat the whole test. 5 or less errors on the retest is considered a pass.
Results Sheet - Holmes-Wright Lantern - Type B

Observer .............................................. Examiner ......................................................... Date ..............................................

W = White  R = Red  G = Green

Large aperture – DO NOT COUNT IN TOTAL SCORE

<table>
<thead>
<tr>
<th>Code (C)</th>
<th>Correct Response (CR)</th>
<th>Response (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>00</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>R</td>
<td></td>
</tr>
</tbody>
</table>

Small aperture

Run 1  Run 2  Run 3  Run 4  Run 5

<table>
<thead>
<tr>
<th>Clockwise</th>
<th>Anti-clockwise</th>
<th>Clockwise</th>
<th>Anti-clockwise</th>
<th>Random</th>
</tr>
</thead>
<tbody>
<tr>
<td>C  CR  R</td>
<td>C  CR  R</td>
<td>C  CR  R</td>
<td>C  CR  R</td>
<td>C  CR  R</td>
</tr>
<tr>
<td>50 WR</td>
<td>50 WR</td>
<td>50 WR</td>
<td>50 WR</td>
<td>50 WR</td>
</tr>
<tr>
<td>15 RG</td>
<td>15 RG</td>
<td>15 RG</td>
<td>15 RG</td>
<td>15 RG</td>
</tr>
<tr>
<td>00 WW</td>
<td>00 WW</td>
<td>00 WW</td>
<td>00 WW</td>
<td>00 WW</td>
</tr>
<tr>
<td>33 GG</td>
<td>33 GG</td>
<td>33 GG</td>
<td>33 GG</td>
<td>33 GG</td>
</tr>
<tr>
<td>01 GW</td>
<td>01 GW</td>
<td>01 GW</td>
<td>01 GW</td>
<td>01 GW</td>
</tr>
<tr>
<td>55 RR</td>
<td>55 RR</td>
<td>55 RR</td>
<td>55 RR</td>
<td>55 RR</td>
</tr>
<tr>
<td>53 GR</td>
<td>53 GR</td>
<td>53 GR</td>
<td>53 GR</td>
<td>53 GR</td>
</tr>
<tr>
<td>11 GG</td>
<td>11 GG</td>
<td>11 GG</td>
<td>11 GG</td>
<td>11 GG</td>
</tr>
<tr>
<td>17 RG</td>
<td>17 RG</td>
<td>17 RG</td>
<td>17 RG</td>
<td>17 RG</td>
</tr>
</tbody>
</table>

Total Errors on small aperture runs:

<table>
<thead>
<tr>
<th>Run 1</th>
<th>+ Run 2</th>
<th>+ Run 3</th>
<th>+ Run 4</th>
<th>+ Run 5</th>
<th>=</th>
</tr>
</thead>
</table>

Result: PASS/FAIL

(5 or less total errors in 5 runs is considered a pass.)

Examiner’s signature: …………………………………………………………
References

Colour Vision

3. Pape vs CAA 1985, Denison vs CAA 1989 Administrative Appeals Tribunal
5. Owsley C., Vision impairment and driving Survey Ophthal.43,6 May Jun 1999
7. Verriest et al.: New investigations concerning the relationships between congenital colour defects and road traffic security. Int. Ophthal. 2: 87-9
8. Cole B.L., Vingrys A.J.:Reply to the report 'Review of the research basis for the current medical standards for colour vision (Protan deficits)' Soames Job, R.F.

Visual Fields


Further reading


13 Favilla I.,Visual Requirements for drivers licences RACO

Appendix 1. Model forms

1.1 Request and Report Form (Blue Form)

The Request and Report form is the key means of communication between the port operator and the Authorised Health Professional.

The form is used as follows:

1. **Part A**: The port operator completes PART A, encloses copies of relevant supporting information (e.g. previous Health Assessment Report, sick leave summary, relevant worker’s compensation reports or relevant incident reports) and a copy of the Health Professional Record (refer 1.3), and forwards them to the Authorised Health Professional.

2. **Part B**: Upon completion of the assessment, the health professional completes PART B of the form, retains a copy and returns the original form to the port operator.

3. **Part C**: The port operator completes PART C of the form to indicate the action taken as a result of the assessment.

Use of health assessment forms

- **Health Assessment Request and Report Form (BLUE)**: Port operator completes relevant details and provides to AHP.
- **Health Assessment Notification Form and Pilot Questionnaire (PINK)**: Port operator completes relevant details and provides to pilot.
- **Health Assessment Record for Health Professional (GREEN)**: Port operator completes relevant details and provides to AHP.
- **Pilot**: Completes questionnaire and provides to AHP.
- **AHP**: Completes and returns to port operator. AHP retains copy for pilot’s medical record.
- **AHP**: Reviews questionnaire and retains for pilot’s medical record.
- **AHP**: Completes and retains in pilot’s medical record.
Marine Pilot Health Assessment
Request and Report Form
BLUE FORM

CONFIDENTIAL:
THE COMPLETED FORM SHOULD BE RETURNED TO THE PORT OPERATOR
A COPY SHOULD BE RETAINED BY THE AUTHORISED HEALTH PROFESSIONAL

Instructions for the Authorised Health Professional

- You are requested to conduct a health assessment to assess the marine pilot’s fitness for duty according to the details provided in PART A of this form and according to the *Standard for Health Assessment of Marine Pilots (NSW)*.
- You must sight photo identification of the pilot/applicant (e.g. driver’s licence).
- Please perform the assessment, complete PART B of this form and return to the port operator according to instructions noted in PART A, within 7 days of the assessment, OR should the marine pilot be assessed Unfit for Duty, please contact the operator immediately by phone so that appropriate rostering changes may be made.
- Marine pilots are required to present for fasting cholesterol (total and HDL), fasting glucose, haemoglobin and an ECG and VO₂ max for Initial licensing and Periodic Health Assessments. Results will be forwarded to you directly.
- Marine pilots are required to have audiometry for Initial licensing and Periodic Health Assessments. This will be arranged separately if audiometry facilities are not available at your practice.
- You may need to contact the marine pilot’s nominated doctor to discuss conditions that may affect their fitness for duty. Such contact should be made with the pilot’s signed consent (see GREEN FORM).
- Details of the examination should be recorded on the enclosed Health Assessment Record (GREEN FORM). This record is confidential and should be retained by you, not returned to the operator.
- For more detailed information about the conduct of health assessments for marine pilots see the *Standard for Health Assessment of Marine Pilots (NSW)*.
PART A. Request for Health Assessment - Operator to complete

A health assessment is requested to assess fitness for marine piloting duties (refer Inherent Requirements, Section B, Standard for Health Assessment of Marine Pilots (NSW)).

1. Pilot / Applicant details
   - Family name
   - First names
   - Employee no.
   - Date of birth

2. Port Operator details
   - Port operator
   - Supervisor / contact
   - Date of request
   - Phone
   - Facsimile

Account and report to be sent to Supervisor at the following address (please insert postal address or fax no.) ▼

3. Health assessment appointment details
   - Doctor / practice
   - Address
   - Phone
   - Facsimile
   - Appointment date
   - Time

4. Supporting information relevant to the assessment (tick information provided)
   - Previous health assessment report(s)
   - Other (specify - for example relevant sick leave or accidents since last periodic assessment) ▼

5. Assessment required
   - Initial licensing health assessment
   - Periodic health assessment
   - Triggered health assessment

Please provide details of reasons for Triggered Health Assessment and / or any other assessment requirements

6. Tests required
   The following tests are required for all initial licensing and Periodic Health Assessments. They are not routinely required for Triggered Health Assessments.
   - Pathology
     Fasting cholesterol (total and HDL)
     Fasting plasma glucose
     Haemoglobin
   - ECG
     Resting ECG
   - Audiometry
     VO₂ max
PART B. Health Assessment Report - Health professional to complete

☑ I have sighted the marine pilot’s photo ID
   (e.g. driver’s licence, passport, pilot licence)

☐ I certify that I have examined the marine pilot name in accordance with the medical standards contained in the Standard for Health Assessment of Marine Pilots (NSW) and in my opinion the marine pilot is (tick one box only):

☑ Fit for Duty - meets all relevant medical criteria for marine piloting work

☐ Fit for Duty - Conditional
  ☐ Conditional on corrective lenses being worn
  ☐ Conditional on hearing aid being worn
  ☐ Other condition (specify) ▼

☐ Fit for Duty Subject to Review - does not meet all medical criteria, but could perform marine piloting work if the condition is sufficiently under control and pilot is more frequently reviewed than prescribed under periodic review.

   ► I recommend:
   ☐ Review at this practice ▼
   Date of review
   ☐ Specialist referral
   ☐ Local doctor referral
   ☐ Laboratory tests

☐ Fit for Duty Subject to Job Modification – does not meet all medical criteria, but could perform marine piloting work if suitable modifications were made to the duties.

   ► I recommend the following job modifications (including timeframes):

☐ Temporarily Unfit for Duty Subject to Review – does not meet all medical criteria and cannot perform marine piloting tasks as set out in the Inherent Requirements. May perform alternative Non-Safety Critical tasks. May return to full duty pending; improvement in condition; response to treatment; confirmed diagnosis of undifferentiated illness.

   ► I recommend the following in terms of management and review (including timeframes):

☐ Permanently Unfit for Duty – does not meet the medical criteria for marine piloting duties and cannot perform marine piloting tasks in the foreseeable future (> 12 months).

   ► I recommend the following in terms of management and review (including timeframes):

Health professional details (stamp acceptable)

Name

Address

Phone

Facsimile

Assessment date

Signature

Standard for Health Assessment of Marine Pilots (NSW)

PART C - Operator to complete on receipt of Assessment Report

Action taken as a result of health assessment (tick as appropriate and record details):

☐ Periodic health assessment scheduled as per standard
☐ Job modification
☐ Triggered review
☐ Redeployment
☐ Drug assessment

Request and Report Form (Page 3 of 3)
1.2 Pilot Notification and Health Questionnaire (Pink Form)

This form contains the notification to the pilot and the Marine Pilot Health Questionnaire.

The self-administered questionnaire is a screening tool to help identify conditions that might affect the performance of marine pilots. The questionnaire is not a diagnostic tool and no decision can be made regarding the pilot’s fitness for duty until the full clinical examination is performed.

Pilots are required to sign the completed questionnaire in the presence of the Authorised Health Professional to attest to the correctness of the information provided. The health professional should countersign.

The form is used as follows:

1. **Part A**: The port operator requests that the pilot/applicant sign the front of the form to indicate that they have read and understood the statements concerning the health information to be provided. The port operator completes PART A including appointment details and instructions to the pilot/applicant.

2. **Part B**: The pilot/applicant completes PART B and presents to the Authorised Health Professional. The pilot/applicant signs the form as a true statement and the health professional countersigns.

3. The Authorised Health Professional discusses the results with the pilot/applicant as appropriate. The form is retained by the health professional and filed in the pilot’s medical record.

**Use of health assessment forms**

- **Health Assessment Request and Report Form (BLUE)**
  - Port operator completes relevant details and provides to AHP.
  - AHP completes and returns to port operator. AHP retains copy for pilot’s medical record.

- **Health Assessment Notification Form and Pilot Questionnaire (PINK)**
  - Port operator completes relevant details and provides to pilot.
  - Pilot completes questionnaire and provides to AHP.
  - AHP reviews questionnaire and retains for pilot’s medical record.

- **Health Assessment Record for Health Professional (GREEN)**
  - Port operator completes relevant details and provides to AHP.
  - AHP completes and retains in pilot’s medical record.
Marine Pilot Health Assessment
Pilot Notification and Health Questionnaire
PINK FORM

CONFIDENTIAL:
FOR PRIVACY REASONS THE COMPLETED FORM SHOULD BE RETAINED BY THE AUTHORISED HEALTH PROFESSIONAL AND NOT RETURNED TO THE PORT OPERATOR

Instructions for the pilot / applicant

- You are required to attend a health assessment as a condition of your employment; to assess your fitness for marine piloting duties.

- The health assessment must be completed by (date)______________, to ensure that you are able to carry out normal duties.

- Complete the enclosed questionnaire BEFORE ATTENDING THE APPOINTMENT and provide it to the examining health professional. The bottom of the questionnaire must be signed by you in the presence of the examining doctor.

- Take glasses, hearing aid or any other aids required for conduct of your work to the appointment.

- Take all medication that you are currently taking to the appointment or a list of such medications.

- Take photo identification with you to the appointment.

- You will be required to have a blood test as part of your assessment. So as to get a true reading of your blood sugar and cholesterol (total and HDL) you should not eat for a minimum of 8hr (and no longer than 14hr) before your blood test appointment. You may drink water but should not take sweetened drinks.

What happens if the examining doctor suspects there is a health problem?

If the examining doctor finds or suspects something is wrong with your health that you did not know about, they will ask your permission to inform your own doctor. The examining doctor will not treat any medical condition but will give you a letter to take to your own doctor.

If the doctor finds that you do not meet all relevant medical criteria, your supervisor at the port operator will discuss with you the appropriate action to be taken. This may include:

- modification of the duties that you undertake for the port operator; and/or
- scheduling of a further review, tests or specialist referral.

Disclosure of health information – please read carefully and sign to indicate your understanding of how health information is reported, stored and accessed.

The details of your health assessment will remain confidential and will only be reported to your port operator in terms of your fitness for duty. The examining doctor retains all detailed medical papers including your questionnaire responses, test results and the completed record of clinical findings. The examining doctor sends the completed Request and Report Form directly to the port operator indicating your fitness or otherwise for duty.

Other than the above, no information will be disclosed to any other person or organisation without your written permission, except:

- when NSW Maritime appoints a health professional to conduct an audit of the system for the health assessment of NSW marine pilots, then the appointed health professional will have access to the information for the purpose of undertaking the audit; and
- where required by law.

You have the right to access your health records including those held by the Authorised Health Professional and the reports held by the port operator.

Pilot’s declaration

I, ____________________________
(Print name)

certify that I have read and understood the above statement concerning the health information provided herein.

Signature ____________________________

Date ____________________________
PART A - Port Operator to complete

1. Pilot / Applicant details
   Family name
   First names
   Employee no.
   Date of birth

2. Port Operator details
   Port operator
   Supervisor / contact
   Date of request
   Phone
   Facsimile

Account and report to be sent to Supervisor at the following address (please insert postal address or fax no.) ▼

PART B - Marine Pilot Health Questionnaire
Pilot to complete

This questionnaire must be completed in order to help assess your fitness for marine piloting duties. Please answer the questions by ticking the appropriate box or circling the appropriate response. If you are not sure, leave the question blank and ask the examining health professional what it means. The health professional will ask you more questions during the assessment.

1. Are you currently attending a health professional for any illness or injury?
   □ No
   □ Yes ▼
   (Briefly describe together with any medical treatment or medication (prescribed or otherwise) that you are receiving)

2. Have you ever had, or been told by a doctor that you had any of the following?
   2.1 High blood pressure
   2.2 Heart disease
   2.3 Chest pain, angina
   2.4 Any condition requiring heart surgery
   2.5 Abnormal shortness of breath or chest disease
   2.6 Palpitations / irregular heartbeat
   2.7 Anaemia
   2.8 Head injury, spinal injury
   2.9 Seizures, fits, convulsions, epilepsy
   2.10 Blackouts or fainting
   2.11 Migraine
   2.12 Stroke
   2.13 Dizziness, vertigo, problems with balance
   2.14 Double vision, difficulty seeing, or difficulty adapting to changing light conditions
   2.15 Colour blindness
   2.16 Diabetes
   2.17 Neck, back or limb disorders
   2.18 Hearing loss or deafness or had an ear operation or use a hearing aid?
   2.19 A psychiatric illness or nervous disorder?

Official use only (health professional notes)

Standard for Health Assessment of Marine Pilots (NSW)

Pilot Notification and Health Questionnaire (Page 2 of 4)
3. Have you ever had any other serious injury, illness, operation, or been in hospital for any reason?
   - No
   - Yes □ (Briefly describe)

4. Do you smoke or have you ever been a smoker?
   - No
   - Ex-smoker □ Quit date __________
   - Yes □ Number of cigarettes per day __________

5. Do you use illicit drugs?
   - No
   - Yes

6. The following questions are about your sleeping patterns:
   6.1 Have you ever had, or been told by a doctor that you had a sleep disorder, sleep apnoea or narcolepsy?
      - No
      - Yes
   6.2 Has anyone noticed that your breathing stops or is disrupted by episodes of chocking during your sleep?
      - No
      - Yes

Please use the following scale (Epworth Sleepiness Scale) to choose the most appropriate description for each situation. The questions refer to your usual way of life in recent times. Even if you haven’t done some of these things recently try to work out how they would have affected you.

How likely are you to doze off or fall asleep (rather than just feeling tired) in the following situations:

6.3 Sitting and reading
   - Would never doze off (0)
   - Slight chance of dozing (1)
   - Moderate chance of dozing (2)
   - High chance of dozing (3)

6.4 Watching TV

6.5 Sitting, inactive in a public place (e.g., a theatre or meeting)

6.6 As a passenger in a car for an hour without a break

6.7 Lying down to rest in the afternoon when circumstances permit

6.8 Sitting and talking to someone

6.9 Sitting quietly after a lunch without alcohol

6.10 In a car, while stopped for a few minutes in the traffic

TOTAL __________

7. The following questions relate to your intake of alcohol. Please tick the answer that is correct for you:

   Official use only

7.1 How often do you have a drink containing alcohol?
   - Never (0)
   - Monthly or less (1)
   - Two to four times a month (2)
   - Two to three times a week (3)
   - Four or more times a week (4)

7.2 How many drinks containing alcohol do you have on a typical day when you are drinking?
   - 1 or 2 (0)
   - 3 to 4 (1)
   - 5 to 6 (2)
   - 7 to 9 (3)
   - 10 or more (4)

7.3 How often do you have six or more drinks on one occasion?
   - Never (0)
   - Monthly or less (1)
   - Two to four times a month (2)
   - Two to three times a week (3)
   - Four or more times a week (4)

7.4 How often during the last year have you found that you were not able to stop drinking once you had started?
   - Never (0)
   - Monthly or less (1)
   - Two to four times a month (2)
   - Two to three times a week (3)
   - Four or more times a week (4)

7.5 How often during the last year have you failed to do what was normally expected from you because of drinking?
   - Never (0)
   - Monthly or less (1)
   - Two to four times a month (2)
   - Two to three times a week (3)
   - Four or more times a week (4)

7.6 How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?
   - Never (0)
   - Monthly or less (1)
   - Two to four times a month (2)
   - Two to three times a week (3)
   - Four or more times a week (4)

Question 7 continued overleaf ▷

Standard for Health Assessment of Marine Pilots (NSW)

Pilot Notification and Health Questionnaire (Page 3 of 4)
7.7 How often during the last year have you had a feeling of guilt or remorse after drinking?
- Never (0)
- Monthly or less (1)
- Two to four times a month (2)
- Two to three times a week (3)
- Four or more times a week (4)

7.8 How often during the last year have you been unable to remember what happened the night before because you had been drinking?
- Never (0)
- Monthly or less (1)
- Two to four times a month (2)
- Two to three times a week (3)
- Four or more times a week (4)

7.9 Have you or someone else been injured as a result of your drinking?
- No (0)
- Yes, but not in the last year (2)
- Yes, during the last year (4)

7.10 Has a relative or friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?
- No (0)
- Yes, but not in the last year (2)
- Yes, during the last year (4)

8. The following questions relate to how you are feeling. Please tick the answer that is correct for you.

In the past 4 weeks, about how often did you:

8.1 Feel tired out for no good reason?
- None of the time (0)
- A little of the time (1)
- Most of the time (2)
- All of the time (3)

8.2 Feel nervous?
- None of the time (0)
- A little of the time (1)
- Most of the time (2)
- All of the time (3)

8.3 Feel so nervous that nothing could calm you down?
- None of the time (0)
- A little of the time (1)
- Most of the time (2)
- All of the time (3)

8.4 Feel hopeless?
- None of the time (0)
- A little of the time (1)
- Most of the time (2)
- All of the time (3)

8.5 Feel restless or fidgety?
- None of the time (0)
- A little of the time (1)
- Most of the time (2)
- All of the time (3)

8.6 Feel so restless you could not sit still?
- None of the time (0)
- A little of the time (1)
- Most of the time (2)
- All of the time (3)

8.7 Feel depressed?
- None of the time (0)
- A little of the time (1)
- Most of the time (2)
- All of the time (3)

8.8 Feel that everything was an effort?
- None of the time (0)
- A little of the time (1)
- Most of the time (2)
- All of the time (3)

8.9 Feel so sad that nothing could cheer you up?
- None of the time (0)
- A little of the time (1)
- Most of the time (2)
- All of the time (3)

8.10 Feel worthless?
- None of the time (0)
- A little of the time (1)
- Most of the time (2)
- All of the time (3)

For existing employees only

9. Have you experienced difficulty completing any tasks required for your piloting work (e.g. climbing pilots ladder)?
- No
- Yes ▼

(Briefly describe)

10. Have you been involved in any accidents or near misses at work in the period since your last assessment?
- No
- Yes ▼

(Briefly describe)

11. Have you tested positive for drugs or alcohol in the period since your last assessment?
- No
- Yes ▼

(Briefly describe)

Pilot’s declaration
(to be completed by the pilot in the presence of the health professional after completing the questionnaire)

I, __________
(Print name)
certify that to the best of my knowledge the information provided by me is true and correct.

Signature of pilot

Signature of health professional

Date __________

Standard for Health Assessment of Marine Pilots (NSW)
1.3 Record for Health Professional (Green Form)

The Health Assessment Record for Health Professionals is a tool that guides the health assessment process. It provides a standard format for recording the results of the assessment, which should then be filed by the Authorised Health Professional in the pilot’s medical history.

The form should be used as follows:

1. **Part A:** The port operator completes PART A, and includes the form with the Request and Report Form (Form 1.1) and forwards to the Authorised Health Professional.

2. **Part B:** The health professional records the results of the clinical examination in PART B and retains the form in the pilot’s medical record.

3. The completed Health Assessment Record is not to be forwarded to the port operator for reasons of privacy. The Authorised Health Professional should summarise the results in terms of fitness for duty on the Request and Report Form (Form 1.1).

**Use of health assessment forms**

- **Health Assessment Request and Report Form (BLUE)**: Port operator completes relevant details and provides to AHP. AHP completes and returns to port operator. AHP retains copy for pilot’s medical record.

- **Health Assessment Notification Form and Pilot Questionnaire (PINK)**: Port operator completes relevant details and provides to pilot. Pilot completes questionnaire and provides to AHP.

- **Health Assessment Record for Health Professional (GREEN)**: Port operator completes relevant details and provides to AHP. AHP reviews questionnaire and retains for pilot’s medical record. AHP completes and retains in pilot’s medical record.
# Marine Pilot Health Assessment

**Record for Health Professional**

**GREEN FORM**

**CONFIDENTIAL:**
FOR PRIVACY REASONS THE COMPLETED FORM SHOULD BE RETAINED BY THE AUTHORISED HEALTH PROFESSIONAL AND NOT RETURNED TO THE PORT OPERATOR

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**PART A - Port Operator to complete**

1. **Pilot / Applicant details**
   - **Family name**
   - **First names**
   - **Employee no.**
   - **Date of birth**

2. **Port Operator details**
   - **Port operator**
   - **Supervisor / contact**
   - **Date of request**
   - **Phone**

3. **Health assessment appointment details**
   - **Doctor / practice**
   - **Address**
   - **Phone**
   - **Appointment date**
   - **Time**

---

**PART B. Examination Record - Health Professional to complete**

1. **Hearing (Audiometry results)**

<table>
<thead>
<tr>
<th></th>
<th>0.5 kHz</th>
<th>1.0 kHz</th>
<th>2.0 kHz</th>
<th>3.0 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   **Notes ▼**

2. **Vision**

   2.1 **Visual acuity**

<table>
<thead>
<tr>
<th>Uncorrected</th>
<th>Corrected</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>L</td>
</tr>
<tr>
<td>6 /</td>
<td>6 /</td>
</tr>
</tbody>
</table>

   **Are contact lenses worn?**
   - Yes [ ]
   - No [ ]

   2.2 **Near vision**

   - **Uncorrected**
   - **Corrected**

   **Pass** [ ]
   - **Fail** [ ]

2.3 **Visual fields (Confrontation to each eye)**

   - **Normal** [ ]
   - **Abnormal** [ ]

2.4 **Colour vision, if required (Isihara: >3 errors / 12 screening plates is a fail)**

   **Pass** [ ]
   - **Fail** [ ]

   **Notes ▼**

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Standard for Health Assessment of Marine Pilots (NSW)

Record for Health Professional (Page 1 of 4)
3. Coordination / Balance

3.1 Romberg's test (a pass requires the ability to maintain balance while standing with shoes off, feet together side by side, eyes closed and arms by sides, for thirty seconds)

   Normal □  Abnormal □

   Notes ▼

4. Body Mass Index

Weight  kg
Height  m
BMI  $BMI = \text{Weight (kg)} / \text{Height (m)}$

   Notes ▼

5. Musculoskeletal

5.1 Are there any scars, abnormalities or deformities of the neck, back or limbs? ▼ Yes (specify) □  No □

   Notes ▼

5.2 Assessment for movements, power and coordination

   NECK - rotation, flexion and extension (may be combined with thoraco-lumbar spinal movement)
   - Able to rotate left to 90° (minimum of 45° cervical spine)  Yes □  No □
   - Able to rotate right to 90° (minimum of 45° cervical spine)  Yes □  No □
   - Able to extend  Yes □  No □
   - Able to flex  Yes □  No □

   UPPER LIMBS - shoulder, elbow, wrist and hands
   - Able to abduct arms above head  Yes □  No □
   - Able to push and pull with each arm  Yes □  No □
   - Able to hold a 6kg weight with arm extended to the horizontal to the front for 10 sec, each arm in turn  Yes □  No □

   Test grip strength with both hands using Jamar:
   - The Jamar is to be set at a distance to approx the diameter of the man-rope (28mm) plus thin gloves (~30mm).
   - The Jamar is alternated between hands for 3 readings.
   - The readings for each hand are averaged.
   - The strength in kg is compared to the table of norms - refer page 89 in the standard. (Patient should be ≥50th percentile for age in each hand).

<table>
<thead>
<tr>
<th></th>
<th>Reading 1</th>
<th>Reading 2</th>
<th>Reading 3</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   BACK
   - Able to flex, extend and rotate the back  Yes □  No □
   - Able to form bridge (hover) for ≥60 sec (see diagram)  Yes □  No □

   Straight back and legs
   Toes supporting body weight
   Rest on elbows and forearms

   LOWER LIMBS - hips, knees and ankles

   Examine:
   - Gait  Normal □  Abnormal □
   - Able to stand and walk on toes  Yes □  No □
   - Able to stand and walk on heels  Yes □  No □
   - Able to squat down and rise  Yes □  No □
   - Able to 'bunny hop'  Yes □  No □
   - Able to 'duck waddle'  Yes □  No □

5.3 Assessment summary

   Is the applicant able to achieve all movements described in the musculoskeletal criteria?  Yes □  No □

   Notes ▼

Standard for Health Assessment of Marine Pilots (NSW)
6. Cardiovascular System

6.1 Blood pressure (repeat if necessary)
- Systolic [ ] mm Hg
- Diastolic [ ] mm Hg

6.2 Pulse rate [ ]
- Regular [ ]
- Irregular [ ]

6.3 Heart sounds [ ]
- Normal [ ]
- Abnormal [ ]

6.4 Peripheral pulses [ ]
- Normal [ ]
- Abnormal [ ]

6.5 Calculation of Cardiac Risk Score (refer Cardiovascular chapter for scoring)

<table>
<thead>
<tr>
<th>Data</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age / sex</td>
<td></td>
</tr>
<tr>
<td>Smoker: Y/N</td>
<td></td>
</tr>
<tr>
<td>Blood pressure (systolic)</td>
<td></td>
</tr>
<tr>
<td>ECG (left ventricular hypertrophy)</td>
<td></td>
</tr>
<tr>
<td>Fasting cholesterol - TOTAL</td>
<td></td>
</tr>
<tr>
<td>- HDL</td>
<td></td>
</tr>
<tr>
<td>Fasting plasma glucose (diabetes)</td>
<td></td>
</tr>
<tr>
<td>TOTAL SCORE</td>
<td></td>
</tr>
</tbody>
</table>

Other considerations e.g. physical activity, diet, symptoms, family and past history, co-morbidity, work conditions:

6.6 VO₂ max test
- Heart rate [ ] bpm
- VO₂ max [ ] ml/kg/min

6.7 Haemoglobin [ ] g/100ml

7. Chest / Lungs
- Normal [ ]
- Abnormal [ ]

8. Abdomen
- Normal [ ]
- Abnormal [ ]

9. Sleep - Epworth Sleepiness Scale
- ESS Score (Record results from Q6 of the Health Questionnaire)

10. Alcohol - Audit Questionnaire
- Audit Score (Record results from Q7 of the Health Questionnaire)

11. Psychological Health
11.1 K10 Questionnaire Score
- (Record results from Q8 of the Health Questionnaire)

11.2 Is attitude, speech and behaviour appropriate?
- Yes [ ]
- No [ ]

12. Medication
- (Record details of medications from Q1 of the Health Questionnaire)

Standard for Health Assessment of Marine Pilots (NSW)

Record for Health Professional (Page 3 of 4)
Relevant clinical findings and action

Note comments on any relevant findings detected in the questionnaire or examination, making reference to the requirements of the standard.

Were there any significant findings?

- Yes (describe) □ No □

Were the criteria for the standard met?

- Yes □ No (describe) □

Are any further investigations / referral required?

- Yes (describe) □ No □

How has the pilot been classified?

- Fit for Duty
- Fit for Duty Subject to Review
- Fit for Duty Subject to Job Modification
- Temporarily Unfit for Duty Subject to Review
- Permanently Unfit for Duty

If classified Fit for Duty Subject to Review, what are the reasons and what date should the pilot be reviewed?

If classified Fit for Duty Subject to Job Modification, what alternative duties / job modifications have been suggested / discussed? What timeframes do the modifications apply to?

If classified Temporarily Unfit, was the port operator contacted immediately?

- Yes □ No □

What timeframe was advised?

If classified Permanently Unfit for Duty, what are the reasons?

Was the pilot’s GP contacted (with their consent)?

- Yes □ No □

Make brief notes regarding discussion with the GP

Other clinical notes

Name of examining doctor

Date Signature

Standard for Health Assessment of Marine Pilots (NSW)

Record for Health Professional (Page 4 of 4)