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A Guide to Good Practice on Port Marine Operations

Prepared in conjunction with the port marine safety code

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Introduction

i The *Port Marine Safety Code* represents a new approach to the management of safety in ports. It was developed with the help of a wide range of interests in the ports and shipping industries. The code introduces a national standard for every aspect of port marine safety. It aims to improve safety for those who use or work in ports, their ships, passengers and cargoes, and the environment. It establishes a measure by which harbour authorities can be accountable for the legal powers and duties which they have in order to run their harbours safely. Its object is the widest possible adoption of good practice.

ii The code is intended to apply to all harbour authorities, to the extent that they have duties and powers relating to marine safety. It applies to port marine operations the well-established principles of risk assessment and safety management systems. Ports and harbours are very varied – they will also adopt varied systems to implement the code, although following the general principles the code describes.

iii This *Guide to Good Practice on Port Marine Operations* has been written to support the code. Its layout follows the code as far as possible for ease of reference but only the main points are repeated. The aim is that whenever a duty or obligation is identified in the code, advice on its implementation should be provided in this guide. The object is to summarise and publicise illustrations of industry good practice for the benefit of those with responsibility for port marine safety. The aim has been to include a variety of examples wherever possible – every port is different and a range of good practice is therefore appropriate.

iv The code and this guide are complemented by a suite of national occupational standards for port marine professionals. This guide discusses how these may be used.

v A wide range of people may have recourse to this document. Its language and level of detail has been targeted at practising harbour masters, or those studying to qualify as such, and others who have responsibility for safety within ports. But it is not just for the waterfront and the classroom. It is for the boardroom too, seeking to advance board members' practical understanding of the duties they hold, and the work of those who discharge them on their behalf.

vi This document is intended as a guide only. It gives basic general information on the main legislation applicable to ports, harbours and docks. It should not be regarded as a definitive statement of the law. Harbour authorities should consider seeking professional legal advice on the applicability of any particular aspect of legislation in relation to their own circumstances.

vii This guide has been put together with the help of a wide range of contributors associated with the ports industry. DTLR has undertaken to co-ordinate the maintenance of this guide. Regular reviews of practice are intended in conjunction with all sides of the ports industry. Comments and accounts of new good practice will always be welcome. Ports Division should also be informed whenever it becomes apparent that advice in this guide has been superseded in any way.

viii The *Port Marine Safety Code* represents a code of practice for the ports industry. It does not take away the responsibility of harbour authorities for their legal functions – its aim is precisely the opposite: to set out what they are accountable for.

ix The code makes no new law. It sets out in a single document a summary of the legal functions of statutory harbour authorities. Some of these are of many years' standing. The code has demonstrated that the duties of harbour authorities, and the related statutory powers they have been given, establish an adequate legal framework for the systematic and accountable management of marine safety in their waters.

x Since the code made no new law, it is evident that a supporting guide to good practice cannot either. This guide has no such pretensions. There are some examples where port marine safety legislation is prescriptive – there may be only one way in which a harbour authority can comply. More commonly, ports legislation recognises the diversity of local circumstances and allows for statutory harbour authorities to decide the most appropriate approach. Neither the code, nor this guide, promotes uniformity for its own sake. Taken to an extreme, this would frustrate the fundamental aim of advancing safety. There are several equally and entirely legitimate ways of discharging a range of port marine safety functions. The choice among them is the duty holder's.

xi Good practice is built on experience and is therefore evolutionary. This guide will be kept under review by its sponsors as a living document. It is published in a form which is easy to amend and improve. It will be kept under review, expanded and enhanced with the passage of time and as good practice itself is developed and implemented by the authorities complying with the code. To this end, the continued contribution of users will be crucial to the future development of this guide.

xii The aim of this guide is to promote nationally agreed standards. It is written to be applicable to ports of all sizes with powers to regulate navigation. The broad range of activities pursued in ports both large and small means that not all sections will be of direct relevance to all. Conversely, it may be that some highly specialised activities have not been included.

xiii Marine operations in ports are diverse. For the purposes of this guide, marine operations have been taken to mean the moving, berthing and unberthing of ships and other marine craft within the limits and approaches of a harbour authority. This guide aims to provide advice and information on these operations and all the various activities which support them. In particular, it focuses upon those affecting the safety of life, property and the environment.

xiv This guide does not aim to consolidate into a single document all the many other sources of advice on port marine operations – beginning with the code, legislation, standards and publications. Many of these are cited by reference in this guide. The status of these other sources varies; they are not all legislative or otherwise mandatory; but may nevertheless be recognised by industry as the best currently available. They have been included in this guide accordingly.

xv This guide must be a practical document to achieve its aim. It is not simply a 'blown-up' version of the code. A key feature is therefore the inclusion of examples of good practice. These are not intended to show the one and only way; wherever possible a variety of examples are, or will be, included.

xvi National occupational standards for port marine personnel are being developed alongside the code and this guide. Nationally agreed standards for port marine operations are incomplete without corresponding standards for those with a key role in these operations. This guide refers to these occupational standards but agreed guidance on their use by harbour authorities has yet to be developed.

SECTION 1
The Legal Background

Summary

1.1 The code explains (Introduction, para 6) that the duties of a harbour authority are of three kinds. Some are statutory duties, imposed either in the local legislation for that authority or in general legislation. There are in addition general common-law and fiduciary duties. Statutory duties and powers may be in general or local legislation.

General duties and powers

1.2 The code identifies these general duties of harbour authorities relevant to port marine safety:

A Harbour authorities have a duty to take reasonable care, so long as the harbour is open for the public use, that all who may choose to navigate it may do so without danger to their lives or property.

B This includes an obligation to conserve, and facilitate the safe use of, the harbour; and a duty of care against loss or injury caused by the authority's negligence.

C Each harbour authority has an obligation to have regard to efficiency, economy and safety of operation as respects the services and facilities provided.

D Harbour authorities typically have an express duty to take such action as the harbour authority consider necessary or desirable for or incidental to the maintenance, operation, improvement or conservancy of their harbour.

Chapter 1.2 of the code gives an outline of the main related duties.

Specific duties and powers

1.3 In addition to these general duties, chapter 1.3 of the code considers a number of specific duties and powers and identifies the following general principles:

A A harbour master should have his powers determined in byelaws.

B Powers to direct vessels are available – and should be used – to ensure safety of navigation.

C Dangerous vessels and substances, and pollution, must be effectively managed.

D A pilotage service must be provided if required in the interests of safety.

E Properly maintained aids to navigation must be provided, and any danger to navigation from wrecks or obstructions effectively managed.

These principles are developed in separate chapters of the code, and in this guide.

Port marine safety legislation

1.4 There is a substantial body of applicable general legislation, but many of the principal duties and powers of a harbour authority are in local Acts, or orders made under the Harbours Act 1964. This legislation includes powers to make supporting byelaws. Chapter 1.4 of the code explains how the local legislation can be changed.

Legislation fit for purpose

1.5 A harbour authority needs to keep its legislation under review to ensure that it remains fit for purpose in changing circumstances. The code proposes as good practice that the local legislative requirements for marine safety will be determined by risk assessment (Section 4). Where it becomes clear to a harbour authority that certain legal responsibilities cannot be discharged effectively using available powers and other measures, and that authority does not have the powers to rectify the situation, it is good practice for that authority to seek the necessary additional powers. By the same token, it is good practice to take the opportunity to dispense with redundant or obsolete legal functions by the means described in chapter 1.4 of the code.

1.6 It is essential that all harbour authorities are aware of their local duties and powers, and are well versed in all local legislation. Harbour authority boards and managers must understand clearly the meaning of all the relevant legislation which affects their harbour in order to

avoid failing to discharge their duties or exceeding their powers. It is good practice to keep all legislation – including byelaws and directions – under regular review. The intervals between review will reflect the likely need for change – adopting a fixed period might perversely delay necessary amendments.

Byelaws

1.7 All harbour authorities have wide powers under their own special legislation, (derived from Section 83 of the Harbours, Docks and Piers Clauses Act 1847), which allow them to make byelaws for all aspects of the movement and regulation of vessels within a port. Byelaws can cover a wide range of subjects, eg

- navigational rules;
- general duties of Masters;
- movement of hazardous and polluting goods;
- alcohol and drugs;
- ferries, lighters, barges and tugs; noise and smoke;
- recreational craft including water-skiing, jet-biking;
- bathing;
- speed limits;
- licensing port craft; and
- licensing personnel (eg watermen).

The code describes the function (para 1.2.11) and making (1.4.6) of harbour byelaws. The procedure for each authority is in its local legislation. Modern practice replaces that in Clause 83 of the Harbours, Docks and Piers Clauses Act 1847 with the modern standard in Section 237 of the Local Government Act 1972. This standard has itself been adapted by some authorities, to allow byelaws to be modified upon confirmation by the Secretary of State, although Section 237 by itself does not allow this.

Directions

1.8 Making and changing byelaws is a prolonged process. These powers enable a harbour authority, after due consultation and approval by the appropriate Government department, to lay down general rules for navigation, subject to certain constraints, and to publish them in the form of General Directions.

1.9 Most harbour masters (or their representatives), also have the power to give Special Directions to specified vessels in specific cases. As a general rule byelaws are the most potent power available to the harbour master. General Directions, however, whilst still carrying the force of law, are often easier to achieve and amend, and thus act as a useful mechanism for managing navigation and furthering safety.

More guidance on byelaws and directions

1.10 Section 7 of this guide deals with the regulation of navigation. Byelaws and directions are tools for this purpose. That Section contains more guidance about how they can be used.

Licensing

1.11 Some harbour authorities have responsibility for licensing port craft, personnel (local watermen) and works in, or adjacent to, navigable water. All harbour authorities have power in the Pilotage Act to approve or licence pilot boats. In all these processes proper and appropriate standards and competencies need to be established and applied uniformly in the interests of safety.

Enforcement

1.12 The code requires (paras 2.4.4–6) that byelaws and directions adopted in order to manage identified marine risks should be backed by an appropriate policy on enforcement; and that each authority should have a clear policy on prosecution, which is consistent with the safety assessment on which its directions are based. The Department is also developing proposals on enforcement and plans to start consultation in Autumn 2001.

SECTION 2

Accountability of the duty holder

2.1 Summary

2.1.1 Chapter 1.5 of the code is about who is accountable for what aspects of safety of navigation in harbours; and how that responsibility is discharged. It is based on these general principles:

A Each harbour authority is accountable for managing operations within the port safely and efficiently and its board members should hold themselves responsible for ensuring that it does so.

B Each harbour authority should make a clear published commitment to the standard of marine safety required to comply with this code.

C This code represents the national standard against which the policies, procedures and performance of harbour authorities may be measured.

D Executive and operational responsibilities for marine safety must be clearly assigned, and those to whom they are entrusted must be held accountable for their performance.

E Harbour authorities must have a 'designated person' to provide independent assurance about the operation of its marine safety management systems, who has direct access to the board.

2.1.2 Section 1.5 of the code and this guide offers more detailed guidance about what that means in practice.

DEMONSTRATING COMPLIANCE

2.1.3 Paragraph 2.1.2 of the code says that all harbour authorities should develop policies and procedures in accordance with the standard in this code, and should publish the policies and procedures they have adopted to achieve the required standard. Harbour authorities should also publish reports of their formal periodic reviews, setting performance against their policies and procedures and against the standard in the code. Reports should be not more than three years apart.

2.1.4 These requirements can only be met if policies and procedures are systematically recorded and appropriately reported, both for the benefit of the authority, its members and officers; and also accessible to other stakeholders. Compliance with agreed standards is demonstrated to the authority itself, and publicly, by a process of rigorous audit. The results should be open to public scrutiny, which a progressive authority ought to welcome and aim to inform. A proper understanding of the authority's aims and achievements is crucial to their being accepted and supported.

SCOPE

2.1.5 The code (para 1.5.3) explains why a harbour authority is considered to be the 'duty holder' in relation to its marine safety functions. The responsibilities of the 'duty holder' are not, of course, confined to marine operations. Its objectives, policies and procedures will relate to the whole scope of its undertaking. Requirements to publish statements and reports on other matters will vary from one authority to another. It is for each authority to choose whether to make a separate statement or report on matters covered by the code, or to include the content of such a statement in a wider publication – for example, an annual report.

2.2 The report

2.2.1 The code does not prescribe a form in which authorities are to report publicly about the safety of marine operations. It is very important that the management plan should be the authority's: it is for the board to choose the priorities, the emphasis, and the detailed wording, just as much as the policies and procedures. Some authorities will prepare statements specifically for the purpose, others will include reports in one or more other documents which might cover the scope of a single document elsewhere. A management or business plan of any sort is likely to address more than marine operations; and it is entirely right for these to be set in their context in this way. The coherence of a single document, or suite of linked documents, is clearly an advantage, especially as it is only then possible to ensure that connections of policy and procedure are properly made and that nothing is missing. It is hoped to develop further guidance on good practice on the content of reports once the initial ones have been reviewed.

2.2.2 The reports required by the code should include these components:

- a statement of the **aims, roles and duties** of the authority as duty holder – it is a main purpose of Part 1 of the code to provide guidance on this;
- the overarching **policies and procedures** of the authority to achieve those aims, including the commitment to implement the code;
- the **objectives** which support the overarching plans and policies;
- the means of **measurement** of achievement of functional objectives;

- accordingly, a review of how far the authority has achieved its aims and objectives, and of changes it proposes to its policies and procedures.

AIMS, OBJECTIVES AND DUTIES

2.2.3 The aims of an undertaking govern the policies and procedures required to achieve them. They also govern the authority's regulations and procedures. These in their turn determine how much has to be raised in dues to discharge the aims and objectives effectively.

2.2.4 An undertaking's aims and objectives are closely tied to the risks which fall to be assessed and managed by its safety management system. The risks relate directly to the nature of a harbour undertaking – thus, if there was no shipping or boating activity, many of the main risks would not arise. Changes in the harbour business also affect the risk – for example if commercial shipping gives way to recreational use. Users pay but it is also very important for an authority to consider the cost of managing different risks created in this way: the new business or activity might not be worth the cost of managing it safely, or the revenue potential users might be prepared to generate is not enough to make it unaffordable. Some risks remain even when there is no shipping activity – for example, if the public retain access to the water and other hazards: these may become significant if revenue to manage them falls away. In such circumstances it may be necessary to mitigate risk by regulatory action.

2.2.5 The aim of an undertaking – in its capacity as a statutory harbour authority – will be related to its purpose: to discharge the legal functions for which it is the 'duty holder'. These may be linked to other functions, for example those of a company, a local authority, or other statutory body entrusted with harbour functions. A statement of aims, encompassing marine operations in the harbour may already have been made in a document relating to those functions – for example, a company annual report, a management plan, or some other policy statement. It may be necessary, however, to review such statements considering whether or not they fully reflect the commitments made pursuant to the code.

2.2.6 The following sample statements illustrate the sort of aims, that a harbour authority might adopt to illustrate its commitment to its duties:

- The Authority aims to undertake and regulate marine operations so as to safeguard the harbour, its users, the public and the environment.

- The Authority aims to run a safe, efficient, cost-effective, sustainable harbour operation for the benefit of all users and the wider community.

- The Board aims to fulfil its legal responsibilities whilst meeting the changing needs of all harbour users.

- The Board aims to maximise the quality and value for money of its services, and to maintain dues at a competitive level so as to attract users to the harbour.

- The Authority aims to meet the national requirements in the code.

They also recognise, as a management needs to explicitly, that the Authority is the 'duty holder' for the purposes of the code; and thus ultimately accountable for meeting the standard the code requires.

POLICIES AND PROCEDURES

2.2.7 If they are to be shown to have any practical effect, published aims and objectives need to be under-pinned firstly by appropriate statements of policies and procedures. The linkage to other subsidiary elements of the framework becomes evident – for example, a training policy must be applied by adopting training and competence standards.

2.2.8 Implementing the code is a matter of policy to be adopted by each harbour authority. This would include a commitment to the publication of a policy statement and of periodic reports, as the code envisages.

SPECIFIC POLICIES

2.2.9 Examples of specific policy statements include:

GENERAL MANAGEMENT POLICY

The Authority will support the [commercial/fishing/recreational] activities in the harbour through the provision of appropriate services of good value

The Authority will also support these activities through efficient regulation of shipping/users within harbour limits.

The policy of the Board and Management is to:

- manage the assets of the Authority safely, economically and efficiently;
- maintain harbour craft and other [perhaps specified] equipment to the highest industry standards;
- pursue modern cost-effective methods [perhaps specifying particular activities, such as dredging or surveying];
- train the operational staff to the highest professional standards;
- ensure that staff are properly trained in emergency and contingency procedures.

SAFETY AND ENVIRONMENTAL PROTECTION POLICY

The Authority will discharge its general and specific statutory duties in respect of:

- the regulation of traffic and safety of navigation within harbour limits;
- the conservancy of the harbour and its seaward approaches;
- the protection of the environment within the harbour and its surroundings; and

- ensuring so far as reasonably practicable the safety at work of its employees and other persons who may be affected by its activities;

and for these purposes will:

- facilitate the safe movement of vessels and craft into, out of, and within the harbour;
- carry out the functions of the Authority with special regard to their possible impact on the environment;
- prevent acts of omissions which may cause personal injury to employees or others, or damage to the environment;
- create and promote an interest and awareness in employees and others with respect to safety and protection of the environment; and
- take a leading role in the implementation of the [Estuary Management Plan/Special Area of Conservation Management Plan].

RESOURCES

2.2.10 The board of each harbour authority is responsible for ensuring that adequate resources are provided to its officers to enable them to operate the policies, procedures and systems effectively, recognising that proper discharge of the authority's duties will otherwise be compromised. This includes adequate resource for training. All this needs to be reflected in a stated policy.

PLANS

2.2.11 Harbour authorities are given statutory powers and duties in the interests of securing the improvement, maintenance or management of the harbour in an efficient and economical manner or of facilitating the efficient and economic transport of goods or passengers by sea or in the interests of the recreational use of sea-going ships. Requirements to improve, maintain and manage have to be related to the needs, and resources of the harbour; and prioritised. Plans must be realistic, achievable in a reasonable timeframe, and properly supported with resources.

OBJECTIVES

2.2.12 Aims, policies and procedures are supported by specific objectives, related to the particular requirements of the code – and any other legislation or code of practice which the authority elects to bring within the management plan where marine operations are dealt with.

2.2.13 Objectives should be short and crisp. Where appropriate, they should relate to a specific time frame. An example could be:

- to develop a harbour marine safety code by [a specified date] which meets all the relevant requirements of the code.

2.2.14 Not all the requirements of the code are relevant to all authorities. Some have no pilotage, and a review would discover no need to provide such a service. Others have no commercial activity – they handle no commercial vessels; or any of the berthing and dock facilities that go with them. Their professional staff may require particular skills for the local circumstances, but those associated with a commercial port might not be among them. Objectives will be framed and need to be stated accordingly.

MEASUREMENT

2.2.15 Objectives need to be expressed in terms which indicate how that progress can be measured. Objectives need not be quantifiable targets, but their purpose is to enable progress and achievement to be measured in some way. Where an objective does not relate to a specific time frame, there will be a place for simple performance indicators – for example, indicating how often inspections will be done; or the performance level inspections will be expected to reveal. They might relate not only to internal inspections but, for example, set a standard for aids to navigation which the authority is expected to demonstrate to the General Lighthouse Authority. There will also need to be indicators forming a basis for audit.

ASSIGNMENT OF FUNCTIONS

2.2.16 Paragraph 1.5.4 of the code says, although harbour authorities have powers to appoint a harbour master, and to authorise pilots, and may properly entrust the operation of the harbour to such professional people, they cannot assign their accountability. **Board members may not abdicate accountability on the grounds that they do not have particular skills**. They retain strategic oversight and direction of all aspects of the harbour operation. They must ensure that powers are discharged but not exceeded.

2.2.17 Paragraphs 1.5.10 to 1.5.12 of the code include general principles for the appointment of officers. It is important that executive and operational responsibilities should be assigned appropriately by every authority – and to properly trained people. In some small authorities, functions may be combined. It is also important in all cases that there is a proper separation of safety and commercial functions. This is important for authorities of all sizes.

2.2.18 Delegations must be clear and formal; and must not obscure the accountability of the authority and its board members. All the authority's employees should have training appropriate to the responsibilities for marine operations assigned to them relating to the safety of marine operations. National occupational standards being developed alongside this code serve this purpose.

2.2.19 Delegations are not a substitute for the authority itself being directly involved in safety management. It will normally be appropriate therefore, for an authority's principal officers holding delegated responsibilities for safety to attend board meetings.

JOB DESCRIPTIONS

2.2.20 The use of formal job descriptions is good practice. Some jobs related to marine operations are formal statutory appointments (eg harbour master or pilot), and others are directly related to

legal functions and the exercise of the authority's statutory powers. The assignment and delegation of legal functions including statutory powers must be formalised. A safety management system also demands that the roles and functions upon which its operation depends are formally documented. There can be no uncertainty about 'who does what'.

2.2.21 Plans may be annexed to a management plan, or in the authority's Standing Instructions or Operating Manuals. They need to form a clear and cohesive link to the management chain and identify who is responsible for achieving the objectives – and thereby the authority's policies. The role of 'designated person' should be covered by this means. Visible delegation through job descriptions also provides a reassuring link in the measurement of achieving objectives – by showing that somebody has been given responsibility for a specific task.

OPERATING MANUALS

2.2.22 Operating manuals establish an auditable link between this guide and the procedures adopted by each harbour authority. They answer the questions – 'how do we do this job', and 'is it in accord with good practice'. It will sometimes be the case that objectives also correlate to a section in the operating manual. Certainly, long term or standing objectives should be tested to see if their achievement might usefully be referred to in a manual.

OTHER DOCUMENTS

2.2.23 An authority's management or business plan might also be supported by other documents which form part of the audit trail. As noted elsewhere in this guide, each harbour, pier or dock has individual characteristics, conditions, position and mode of operation. Harbour authorities are equally varied in type and size. Local powers and duties have therefore been conferred by local legislation, created specifically for the harbour authority to which it relates, so that each individual harbour may be operated efficiently and safely. The different forms and levels of this legislation are described in Section 1 of this guide.

2.2.24 The intricacies of local harbour legislation are not in general well understood by users and others in the local community, but it provides the legal framework within which the whole undertaking is conducted. With some general legislation on particular topics, it contains the matters for which a harbour authority holds itself accountable under the code. It will therefore serve a useful purpose for the authority's policy statement – and those who audit it – to point to the main pieces of legislation which establish its legal status and functions.

FREQUENCY OF PUBLICATION

2.2.25 *The Port Marine Safety Code* envisages that each harbour authority will publish a statement on its implementation of the code by 31 December 2001. It proposes that, thereafter, harbour authorities should publish reports of their formal periodic reviews, setting performance against their plans and against the standard in the code. Reports should be at least at three-year intervals: additional reports may also be appropriate where significant interim changes have taken place.

SECTION 3
Consultation

3.1 Summary

3.1.1 The Introduction to the code (paragraphs 26 and 27) says that harbour authorities holding themselves accountable to the local community will aim to work closely with local interests in developing policies and procedures for the discharge of their duties and powers. The code says that harbour authorities must involve all those who work in and use the port and those who represent them. The safety of the port depends upon them all – not just observing and enforcing the regulations but contributing to the assessments on which they are based. There is more on the same line in chapter 2.2.13 and 2.2.14 of the code.

3.1.2 There are two aspects to consultation. Firstly, the involvement of those who work in and use the port and their representatives. Secondly, working with local interests in developing appropriate policies and procedures for the discharge of their duties and powers.

3.1.3 It is paramount that ports operate as a regulated environment; their rules – and their commitment to safety – must be accepted and observed by all. The code notes that safety in harbours is not just a matter for the harbour authority, its officers and its authorised pilots. Users are also required to minimise risk to themselves and others, in doing so they must be able to put forward to the harbour authority their views on the development of appropriate safety policies and procedures.

3.1.4 Port marine operations are technical matters – well understood by experienced mariners, but perhaps much less so by the wider public, including many recreational users. It is important that the appropriate involvement of wider interests safeguards the statutory authority's position – responsibility for managing safety in a harbour rests with the statutory authority. On the other hand, employees, users and others have safety responsibilities too – for themselves, and for others likely to be affected by their work or activity in the harbour. Some understanding, and through it acceptance, of the duty holder's policies and commitment both to safety and the interests of the community is a substantial objective and one which may be progressed and obtained through the right level of consultation.

3.1.5 A safety management system is only effective if the authority responsible takes active measures to involve and secure the commitment of those involved. This applies both to the risk assessment, and to the subsequent operation of the management system. Not all will be the authority's employees.

3.2 Forms of consultation

3.2.1 Consultation takes various forms. There are some specific statutory obligations. These should form the basis for general consultation with users and other interests'. There should also be established formal procedures for consulting employees – including, in the case of Marine Operations, any person not directly employed, but who offers their services under a contract for services, either directly to the port, or indirectly through the shipowner or their local representative.

STATUTORY CONSULTATION

3.2.2 The procedures for harbour orders revising the statutory powers and duties of an authority include explicit guidance on consultation and rights to objection, which need not be repeated here. The appropriate Minister will direct who is to be statutorily consulted by service of notice.

3.2.3 There are also well established procedures for advertising the making of byelaws which will be found in each authority's local legislation. Modern practice is to base these on the procedures for local authority byelaws. Again the detail need not be repeated here.

3.2.4 In both cases, however, it is good practice, and very much in the authority's interest, to have consulted those likely to be affected before formalising proposals by applying for a harbour order or making byelaws. For one thing, it is generally the case that the appropriate Minister does not have power to modify byelaws at confirmation stage – even to take into account grounds of objection which the authority has accepted. If an authority is proposing changes to its powers or regulations as a result of a risk assessment, and has properly consulted about this, there is more likely to be general acceptance of its formal proposals. At any rate, likely grounds of objection will have been discovered and an opportunity found to deal with these informally.

3.2.5 Harbour authorities typically consult the appropriate Minister's officials on draft orders and byelaws. Officials have to be careful not to prejudice formal decisions to be taken later and will not therefore be ready as a rule to comment on the merits of proposals. The opportunity will be taken to promote wider consultation: Officials giving advice will seek to understand how proposals relate to the risk assessment process.

3.2.6 Users have a specific right to be consulted where they are made subject to general and pilotage directions. This is for the very obvious reason that such directions limit the right they would otherwise exercise freely. They have no other convenient recourse against unreasonable directions, such as the right of objection to byelaws allows.

3.2.7 There are sometimes quite specific requirements for the Chamber of Shipping to be consulted. This is to be regarded as a minimum, recognising that the port is likely to have users not represented in this way. Each authority should identify bodies which represent local users, and adopt a policy to consult them about directions. They should also consider drawing proposed directions to the attention of other users by alternative means.

CONSULTATION WITH INTERESTED PARTIES

3.2.8 The general aim of consultation with users and other interests is to provide an opportunity for contributions to be made both on the identification of risk and its management. Risk management often depends less on formal regulation than on winning the understanding of those whose activities create the risk and securing their agreement to safe behaviour. Harbour authorities are therefore encouraged to advertise that they are undertaking a risk assessment, and to seek ways of securing the widest possible response from those likely to have a meaningful contribution.

3.2.9 The code does not require risk assessments to be published in full, though some authorities may wish to do so. There may be well-found concern that drawing attention to risks would unduly alarm some stakeholders, in which case, the harbour authority might choose to issue a report outlining its risk management plan to explain the need for various measures that impinge on users. Whichever approach is adopted it is important that users are adequately informed of any measures adopted to mitigate against particular risks that may affect their particular activities.

USERS' COMMITTEES

3.2.10 Some authorities have established advisory, or consultative, committees for this purpose. In some cases, the authority's local legislation requires them to do so in various ways. It is not necessary, however, for these arrangements to be in the authority's local legislation. The general approach is to identify the bodies needed to make such a committee properly representative and to leave the bodies themselves to choose a member. There are, however, examples where the authority may ask for a different nominee – a right to be exercised exceptionally and for substantive reasons which could be justified publicly.

3.2.11 The ultimate authority for managing the harbour rests with the legally constituted harbour authority. The harbour authority does not share its legal functions with a users' committee; nor is a committee accountable in the way required of harbour authorities under the code. It is good practice to have set out in advance in general terms the circumstances in which it will or will not involve such a committee – for example, where emergency action is required or there are commercial and other confidences.

PROVIDING INFORMATION

3.2.12 The counterpart of effective consultation arrangements is an effective means of communicating information, advice and education to harbour users. Harbour authorities should consider the most appropriate and effective methodologies to employ, perhaps making use of modern technology, in order to reach their target audience.

3.3 Consultation with employees, contractors or other related service providers

3.3.1 Responsibility for port marine safety remains with the duty holder – the harbour authority and its members. It is this body which the code holds accountable for powers and duties entrusted by Parliament. Employees and others may in turn be accountable to the authority through contracts of various kinds, and all are responsible for their own safety at work, but this does not divide or dilute the harbour authority's particular responsibility. So, the decisions on policies and procedures are ultimately for the authority itself to take, and it is for them to see that they are effectively communicated to, and observed by, those whose activities are regulated or affected by the systems put in place.

3.3.2 A harbour authority is unlikely to employ all those who work in its port. For example, pilots may be engaged through a contract for services with a pilot co-operative; tug crews and others may work for service providers either contracted to the port or to particular terminal operators. All employers have a responsibility for the safety of their workforce. Consulting employees on the harbour authority's risk assessment helps them to discharge that responsibility.

3.3.3 Harbour authorities regulation of activities in ports aims among other things to secure the safety of all those engaged in those activities in any capacity. It is to be expected that anybody whose safety is being so regulated may have something to contribute to a risk assessment and it is good practice to make an opportunity for them to participate. It may be appropriate in some cases to consult members of these groups through their own employers – and a consensus is most likely to be achieved in this way. At the same time, such groups may also have trade union representatives, who feel strongly that they should have an opportunity to contribute to the risk assessment. The Department considers that it is good practice to give that opportunity.

SECTION 4

Risk Assessment & Safety Management Systems

4.1 Summary

4.1.1 The agreed national standard, the *Port Marine Safety Code*, relies upon the principle that all harbour authorities will base their policies, and procedures relating to marine operations on a formal assessment of hazards and risks; and that they will maintain a formal safety management system developed from that risk assessment. This is clear from the general principles with which Section 2.1 opens:

A Harbour authority boards are accountable for their duties and powers, and should measure themselves against nationally agreed standards.

B Harbour authorities should publish policies, plans and periodic reports setting out how they comply with the standards set by the code.

C Powers, policies, plans and procedures should be based on a formal assessment of hazards and risks, and harbour authorities should have formal safety management systems.

D The aim of a safety management system is to ensure that all risks are tolerable and as low as reasonably practicable.

E Safety management systems depend upon competence standards applied to all parties involved – these have been developed in parallel to the code.

F Harbour authorities should monitor and adopt good practice.

4.1.2 Some of these principles are re-stated in the opening of Section 2.2:

A Every harbour authority has a legal duty to manage safety and should have a safety management system for marine operations in its waters, developed after a formal risk assessment.

B The safety management system should be described in a published document, setting out the authority's policies and procedures relating to the regulation of marine operations.

C Every harbour authority's statutory powers to regulate marine operations should be exercised in accordance with the harbour authority's safety management system.

D The safety management system should include verification and audit procedures.

E The safety management system should deal with preparedness for emergencies.

These principles are elaborated in the relevant sections of the code (2.1 and 2.2).

BACKGROUND

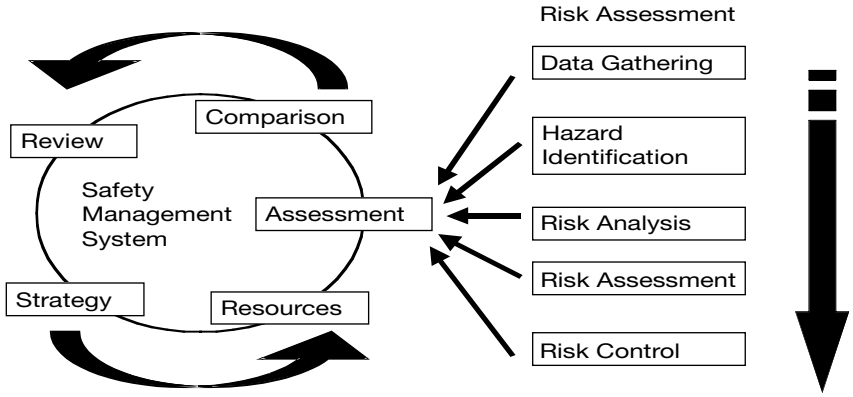
4.1.3 The Health and Safety Executive has promoted a common approach to safety across all industries. In the past, safety regulation was introduced as the result of an accident or a series of accidents and tended to address the most obvious causes. However, over the years a number of defining incidents have altered the way in which safety is viewed. From a purely prescriptive regime, the UK has progressed to a risk based approach that aims to identify risks and control them and to do this in a way that constantly updates the risks in any given process or organisation. This has led to the safety case concept.

4.1.4 The Government has no general powers to approve plans prepared and adapted by harbour authorities to fulfil their marine safety responsibilities. (Oil pollution response plans are a specific exception). The Department will not therefore purport to give formal approval to those plans drawn up to comply with the code, which makes clear that the operation of safety management systems are matters for which the statutory authority is responsible. In the same way, the Department has not issued prescriptive guidance – in this guide – or elsewhere – on the preparation of safety management systems for port marine operations. What follows in this chapter is intended to be general, reflecting the general principles of different approaches.

RISK ASSESSMENT AND SAFETY MANAGEMENT SYSTEMS

4.1.5 This guide uses the terms "risk assessment" and "safety management systems". The table below shows that one is part of the other. It also shows that risk assessment comprises several distinct activities. Since any system will be overlaid on existing measures, the value of these needs to be taken into account at the assessment stage of the cycle.

Figure 1 **Relationship between safety management system and risk assessment**



In short :

- a risk assessment **defines** the risks;
- a safety management system **manages** the risks.

4.1.6 It is likely that most ports will already have a substantial number of the components of a safety management system in place. Informal risk assessment, in one form or another, has been practised for years and may have contributed to the relatively low frequency of serious incidents in UK ports. The code promotes a formal process to provide structure, and ensure that the safety management system is comprehensive and demonstrably fully effective.

4.1.7 Safety management systems have to be maintained as a continuous cycle. Risk assessment is therefore recurrent. If an organisation adapts formalised safety management it is likely to begin with a new and comprehensive assessment of risk. This guide starts at this point in the cycle for this reason.

CONSULTATION

4.1.8 Safety is the business of everyone concerned, around which the entire port operation must function. The code emphasises (paras 26 to 31 of the Introduction, and in para 2.2.13) that an effective and comprehensive risk assessment, and indeed the resultant safety management system, can only be achieved with the total commitment by senior management on the one hand and everybody else on the other. Communication upwards and downwards, and openness, are vital. The process must be seen for what it is – of benefit to the whole organisation.

4.1.9 Involving those working in and using the port and others in the risk assessment, utilising their specialist knowledge and skills is essential, especially in the identification of hazards and the development or refinement of procedures and defences to mitigate those risks. It is good practice to have channels of consultation established already which can be used for this purpose. In addition, especially for those ports with only a regulatory function, it is also very important to involve port users and operators as necessary. They too have a significant contribution to make to the development and maintenance of the safety management system.

4.1.10 Section 3 of this guide covers consultation with the public.

4.2 Risk assessment

4.2.1 The aim of a risk assessment is to define and minimise the risks that have to be managed.

DEFINITIONS

4.2.2 This section makes a distinction between hazard and risk:

- **Hazard** is something that has the potential to cause harm.
- **Risk** is a combination of frequency of occurrence and consequence (outcome).

STAGES

4.2.3 Risk assessment techniques are fundamentally the same for large and small ports, but the execution and detail will differ considerably. A risk assessment will typically involve five stages:

1 Data Gathering and Familiarisation;

2 Hazard Identification;

3 Risk Analysis;

4 Assessment of Existing Measures; and

5 Risk Control.

A risk assessment should aim to identify the hazards that may occur, the events that may cause them and the barriers used to mitigate them. In order to further refine the assessment it may be appropriate to identify key locations within the port area and key vessel types thereby allowing more detailed assessment of the risk associated with the hazard.

CONSULTANTS

4.2.4 Harbour authorities may choose to undertake the risk assessment process and the subsequent development of a safety management system 'in house' or to employ consultants – or a mixed approach – entirely at their discretion. The tables below suggest some of the pros and cons: the choice is not stark black and white. An external consultant is likely to be best employed as a facilitator. In this way, the commitment of management, the contribution by port users, and the consequential sense of ownership should be unaffected by the use of an external risk assessment expert. The aim is to use sufficient expertise to secure a good outcome. The risk assessment and safety management system needs to be thorough, comprehensive and relevant, to the physical constraints of the port entrance and the type, size, and frequency of shipping handled.

4.2.5 The advantages and disadvantages of an 'in-house' approach are set out below:

Table 4.1 **An in-house approach**

ADVANTAGES	DISADVANTAGES
Local expertise and complete understanding of the issues	Lack of unbiased judgements
Knowledge of local frequency/consequence associated with hazards	Inability to tap a source of expertise
Ownership of the assessment shared by management and consultees	Inability to draw on experience from other ports/sections
Ability to refine and update assessment on an almost continual basis	Inexperience in establishing an efficient and user-friendly framework for risks, particularly in large ports where varied geography and activity can result in very large hazard lists.
Time to undertake thorough assessment	
Ease of consultation at all stages	
Reduced costs	

4.2.5A The advantages and disadvantages of using external expertise are:

Table 4.2 **External expertise**

ADVANTAGES	DISADVANTAGES
Ability to make clear unbiased judgements	Lack of local knowledge
Ability to consider differing viewpoints	Longer timescales
Ability to draw on other work	Higher costs
Using wide ranging abilities/backup of a large company	
Minimum demand upon management time	
Potential to receive greater response from contributors (without fear of repercussion)	
Expertise at drawing out the information required	

STAGE 1 – DATA GATHERING AND FAMILIARISATION

4.2.6 Anybody undertaking a risk assessment stage has to start by taking stock of the organisation, its culture, policies, procedures and priorities, and assessing the existing safety management structure, and identifying any relevant hazards and risks. One approach is to use this stage to inform consultation with those working in and using the port, and others; another is to do that consultation as part of this first stage. This stage and a full consultation exercise are not alternatives.

4.2.7 Taking stock covers a review of:

- the adequacy and completeness of any established incident database or similar records;
- current management procedures, including pilotage, port control, navigation management (including VTS); hydrographic/conservancy, marine operations etc;

It is likely to involve:

- interviews with senior managers;
- sample interviews with management, port operations personnel, pilots, and other selected staff;
- auditing of selected marine/navigational safety procedures;
- interviews with a broad sample range of port users and operators;
- utilisation of a structured questionnaire to provide feedback on the value placed by staff and users on the various management systems in place;
- familiarisation visits to port control, VTS or appropriate operations rooms and tripping with pilots;

It will aim to develop an initial list of hazards.

STAGE 2 – HAZARD IDENTIFICATION

4.2.8 Any list of hazards will include those already known (for example from incident records) and the existing defence mechanism/safety management system relating to them. The assessor needs to identify new hazards which may have been ignored or overlooked in the past. A hazard may occur as a result of one or more events taking place, for example a vessel may ground because a pilot did not board at the usual place and the vessel proceeded further inbound than planned. A harbour authority manages these events and minimises their opportunity for occurrence by use of a number of controls or barriers.

4.2.9 Structured meetings need to be held during this process involving relevant marine practitioners at all levels, and port users, including groups such as PEC holders, commercial operators, boatmen, tug operators, crew etc. Where harbour authority areas abut, liaison with that authority is essential. There will also be benefit in consulting with other bodies including those who represent the users or workforce and neighbouring local authorities.

STAGE 3 – RISK ANALYSIS

4.2.10 Hazards need to be prioritised. A method which combines an assessment of the likelihood of a hazardous incident and its potential consequences should be used. This is likely to be a matter of judgement – best taken by those with professional responsibility for managing the harbour. The assessments of others can be gathered by a further round of consultation on that judgement.

4.2.11 The frequency of incidents can be established using historical data identified in the first stage of the work. It can be applied using a qualitative scale or on a per-shipping movement basis, or a combination of the two. There are a number of software tools now available to help in this process and to assist in the subsequently developed safety management system.

4.2.12 The likelihood of a hazardous incident and its potential consequences can often be determined with reference to historical data. However, it should be borne in mind that following an incident the risk of it re-occurring should have been reduced by management action. Therefore any assessment of frequency and consequence is likely to rely to a certain extent upon the judgement of the assessors or others capable of making such a qualified estimate. Historical data alone will not provide a true assessment of the current operations, nor will it necessarily reveal the extreme or very rare event.

4.2.13 Risks can be assessed in four ways:

- consequence to life;
- consequence to the environment;
- consequence to port authority operations; and
- consequence to port users.

Such an approach not only assesses the impact of hazards on port safety, but also their impact on other important areas of the port infrastructure. It may be appropriate to divide the harbour into several different areas for this assessment.

STAGE 4 – ASSESSMENT OF EXISTING MEASURES

4.2.14 Risk assessment includes a review of existing control measures and defences. As a result, additional control measures may be identified for consideration, both where there are gaps in existing procedures and where controls and defences need to be enhanced. Some control measures might also be relaxed so that resources can be redesignated. The overall risk exposure of the organisation itself will be identified during this stage and will allow recommendations to be made to enhance safety.

STAGE 5 – RISK CONTROL

4.2.15 This stage identifies the specific control measures to be adopted. Cost benefit analysis techniques may be used at this stage where a choice of measures exists.

FIRE RISK ASSESSMENT

4.2.16 The Fire Precautions (Workplace) Regulations 1997, as amended (the Fire Regulations), include a requirement to assess fire risks. 'Fire risk' includes the risk of fire occurring and the risk to people in the premises including visitors as well as the workforce.

4.2.17 Process fire precautions are intended to prevent an outbreak of fire or minimise the results if a fire occurs. They are provided for in the Health and Safety at Work etc Act 1974 and regulations made under it, including the Management of Health and Safety at Work Regulations 1992, as amended. The Act covers the storage of flammable materials, the control of flammable vapours, standards of housekeeping, safe systems of work, the control of sources of ignition and the provision of appropriate training and related matters. Inspectors from the Health and Safety Executive (HSE) or local authority officials are responsible for their enforcement.

4.2.18 The Fire Regulations and the Management of Health and Safety at Work Regulations, as amended require:

- a fire risk assessment of the workplace that takes into account all employees and other people who might be affected by fire. There must be adequate provision for disabled people who find themselves on the premises;

- action by the harbour authority regarding the findings of the fire risk assessment that takes account of anyone who might be especially at risk in case of fire. There must be a written record of the implementation of the assessment's findings where there are more than five employees;

- provision and maintenance of fire precautions necessary to safeguard users of the workplace; and

- information, instruction and training for employees about fire precautions in the workplace.

There are crucial legal duties:

- Where employees' safety must be regarded, there must be nominees to undertake roles specified under the fire risk assessment's provisions.

- Employees (or their elected representatives or appointed trade union safety representatives) must be consulted about nominations to carry out particular roles in connection with fire safety and proposed improvements to fire precautions.

- A harbour authority and other employers with workplaces in the same building must inform each other of major risks discovered that might affect their employees' safety and co-operate regarding measures to reduce/control those risks.

- A harbour authority with partial control of premises that contain several workplaces must ensure compliance with the Fire Regulations in sections for which it is responsible.

- There must be reliable and tested means to contact the emergency services.

- The workforce are legally required to co-operate with the harbour authority to ensure the premises are safe from fire and its effects, and to do nothing to place themselves or other people at risk.

4.3 The safety management system

4.3.1 Once the risk assessment has been completed, a safety management system can be finalised or modified, depending on the maturity of the ports current management systems. It is desirable to integrate the Marine Safety Management System with the SMS applied to land-side operations, especially where there is an interface between ship and shore. The action now required will relate directly to the findings and outcome of the initial stages. One method of implementing the safety management system is by the use of a milestone based plan.

4.3.2 Even in those ports that already operate some form of safety management system, it should be recognised that there are likely to be cultural and structural changes within the organisation as a result of this transition. These changes may well take time to implement and will certainly require greater openness and communication within the organisation.

4.3.3 The size of the port and the complexity of the operations will to a large extent, govern the nature of the safety management system put into place by the harbour authority. The purpose of a safety management system is to manage the risks in the port, and although each port will implement a safety management system differently, dependant upon its size and functions, each safety management system will have the same basic format.

4.3.4 A safety management system has to be structured, cohesive, transparent and auditable if it is to meet the objectives of the code. Such systems have been required in the context of land operations for some years prior to the *Port Marine Safety Code*. The outline that follows is based on the procedures described in the Health & Safety Executive publication – Successful Health & Safety Management HS(G)65.

4.3.5 A safety management system is based on the following five functions:

1 Define the Safety Policy;

2 Define the Organisation and personnel roles;

3 Set Standards;

4 Develop Performance-measuring Methods; and

5 Develop an Audit and Review System.

FUNCTION 1 – DEFINE THE SAFETY POLICY

4.3.6 This guide assumes that developing a system will begin with a review of the existing safety policy statement. Such policies should be regularly reviewed, especially following changes to the operating environment, the organisation or external factors such as legislation.

4.3.7 A good safety policy statement should include the following elements:

- a general statement of the organisational goals and policy;
- formal identification of those staff responsible for carrying out the stated policy;

- a high level description of how the policy will be executed;
- the methods by which the policy will be promulgated within the organisation and externally; and
- how the policy will be reviewed and updated.

FUNCTION 2 – DEFINE THE ORGANISATION AND PERSONNEL ROLES

4.3.8 A safety management system depends on clarity about who does what. Deciding this question should take into consideration the following points:

- the organisation, including a review of responsibilities and organisational structure;
- job descriptions, including the development and revision of job descriptions;
- staff selection procedures, including the development of selection criteria;
- training requirements and the development of a training strategy;
- communications – how information is disseminated through; and
- co-operation – details of the working relationships within the organisation.

4.3.9 It is worth stressing again the importance of the wholehearted commitment of senior management to this process. Some senior management actions that play an essential part in creating an effective safety culture are:

- allocating responsibilities;
- providing resources;
- setting objectives;
- setting an example;
- demonstrating commitment and interest; and
- taking action on failures in the system – review of procedures and policies.

FUNCTION 3 – SET STANDARDS

4.3.10 The standards should be set reflecting the policy objectives and detail how these objectives will be carried out. The following should be considered when setting standards:

- they must be measurable with respect to time or frequency, and recordable; and
- they must be realistic in that they must be reasonable and achievable.

FUNCTION 4 – DEVELOP PERFORMANCE-MEASURING METHODS

4.3.11 Standards and measurable objectives need to be supported by some means of measuring performance and checking that targets have been achieved. Staff need to be aware of the reasons for performance measurement.

4.3.12 Performance can be measured either proactively or reactively. Performance is best measured by a combination of both proactive and reactive assessments. Examples of each may include:

Proactive

- safety inspections
- periodic audits
- reviews
- continuous appraisal

Reactive

- accident/incident investigation
- near-miss reporting
- informal reporting and observation

FUNCTION 5 – DEVELOP AN AUDIT AND REVIEW SYSTEM

4.3.13 A safety management system depends upon systematic review of performance using information from monitoring and from independent audits of the whole system. A strong commitment is needed to continuous improvement involving the constant development of policies, systems and techniques of risk control.

4.3.14 Performance can be assessed by internal reference to performance indicators and by external comparison with the performance of business competitors and good practice. Performance should be recorded in reports published by each harbour authority.

4.3.15 If controls fail, reactive monitoring discovers why by investigating accidents or incidents, which have caused loss of life or injury to persons and damage to property and the environment. The objective of investigation is to determine the immediate and underlying causes; and the implications for the design and operation of the safety management system. A specific corrective action may be a sufficient response to the failure of a defensive measure or procedure. However, such immediate measures are not a substitute for an effective and comprehensive, long-term periodic auditing and review process of the safety management system.

4.3.16 The audit process should include the whole of the safety management system and must be proactive in searching for weaknesses and failings in current procedures and systems. It would normally be undertaken in house, but should include periodic external auditing and verification.

4.3.17 Periodic reviews may be a detailed examination of one or more parts of the system or a comprehensive review of larger elements of the system if an audit or significant changes to the operating environment deem it necessary. Developing an annual action plan for the safety management system is one way of ensuring that it remains valid and current. It will also assist in defining and managing the audit and review processes.

4.4 The designated person

4.4.1 The code requires that each harbour authority appoints a 'Designated Person' to oversee the authority's obligations in respect of the provision of an effective safety management system. Paragraph 2.2.9 of the code says that the function of a 'designated person' is to provide independent assurance directly to the 'duty holder' that the safety management system is working effectively. It should be assigned accordingly. A safety management system should include proper record procedures so that the duty holder can be satisfied that the system is functioning properly. Among other things, it should provide for incidents and complaints about safety to be promptly investigated; and for the incident and investigation to be properly recorded.

4.4.2 It is for each authority to determine how best to meet this requirement in the context of their own responsibilities, structure and circumstances. Harbour authorities have dealt with this function in different ways: some – large and small – have not found it straightforward to meet the requirement for independence. There are various good ways of assigning the function. Placing it outside the management line is only one option. It may be the simplest – for example in a local authority where it is already centralised. Another option is to have the function exercised jointly; another is for the system to generate audit trails and reports against which the 'duty holder' can assess advice. Assigning the function within the management line is not ruled out – it will be possible to achieve its objectives in this way depending on how the safety management system as a whole is constructed and operates.

4.4.3 All harbour authorities make decisions on advice – the relationship between a 'duty holder' and its officials is crucial and is secured by a combination of systems and trust. A 'duty holder' will always have taken measures to ensure that the advice it is given is objective and impartial – especially where an official is reporting on his or her own actions or responsibilities. The requirement in the code, that the 'Designated Person' must have an independent oversight of the operation of the port marine safety management system and must have direct access to the Board, highlights that this safeguard needs to be formally incorporated in the safety management system.

SECTION 5
Emergency Preparedness and Response

5.1 Summary

5.1.1 Paragraph 2.2.12 of the code says that a safety management system should include preparations for emergencies – and these should be identified as far as practicable from the formal risk assessment. It adds that emergency plans need to be published and exercised.

5.1.2 Planning is an effective response to all emergencies, whether foreseen or not because it will secure the following:

- a pre-designed structure to work;
- a swift reaction;
- measured decisions;
- prioritisation;
- co-ordination between other agencies.

5.1.3 It is customary to think of emergencies as unexpected: the challenge to those with professional responsibilities for safety is not to be taken by surprise. Factors to be considered can range from designating emergency anchorages and potential beaching points for approaching vessels suffering problems to considering the effects of a lock gate failure or impounding pump breakdown. The emergency might be a fishing vessel suffering from a flooding engine room to a yacht catching fire. Alternatively the problem could be with movie makers or a Tall Ships festival. Whatever the occurrence by adopting a planned approach, evaluating the effectiveness of such a plan and modifying the plan when necessary, will not only reduce the impact of potential problems, but also prove to be cost effective.

5.2 Dangerous substances

5.2.1 Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997 defines the various categories of substances classified as Dangerous and refers to International Maritime Dangerous Goods Code (IMDG) for individual definitions and classifications. These Regulations apply if dangerous substances transit, or are handled, within the harbour area. Part V of the Dangerous Substances in Harbour Area Regulations 1987 covers Liquid Dangerous Substances in Bulk.

COMAH REGULATIONS

5.2.2 If certain dangerous substances are stored in large quantities then the Control of Major Accident Hazard Regulations will apply (see legislation for thresholds.). This legislation applies to the operator of the specific site, it also considers the type of substance, the quantity stored and what other combinations of product reside in the vicinity. The outcome of this will dictate the tier in which the site will be placed either top tier or low tier.

5.2.3 COMAH requires those responsible for what it calls top-tier sites to:

- carry out a full quantitative assessment;
- submit a safety case report to the Local Authority and other appropriate authorities for consultation;
- submit the final documentation to the HSE for approval;
- carry out a programme of exercises;
- provide appropriate information to neighbouring sites;
- make information available to the public.

Those responsible for lower-tier sites are required to:

- plan;
- provide information to the public.

Good guidance can be obtained from the HSE about top-tier and lower-tier sites.

DANGEROUS SUBSTANCES IN HARBOUR AREA REGULATIONS (DSHAR) 1987

5.2.4 The Dangerous Substances in Harbour Area regulations 1987 defines the meaning of a dangerous substance and sets out the requirements for entry into the harbour area. It includes the harbour master's powers, marking and navigation of vessels, handling of dangerous substances, bulk liquids, packaging and labelling, storage and explosives. Most importantly, it requires the preparation of emergency plans by harbour authorities.

5.2.5 Before Dangerous Substances can be handled within a harbour area, the harbour authority must prepare an effective emergency plan. The harbour authority must consult the emergency services and any other body it considers appropriate in the preparation of such a plan. The harbour authority can appoint inspectors to enforce the entry of dangerous substances into the harbour area and ensure the marking and navigation of vessels is carried out in a safe manner. This is particularly important to ensure third parties maintain adequate safety standards.

5.2.6 The harbour master must record the granting or revoking of an exemption from the requirement to notify the entry of a dangerous substance. The purpose of notification is to ensure adequate preparation can be made to store and handle the appropriate substance.

5.2.7 The harbour master should consider the safety of any person either within or outside the harbour area when giving directions. The harbour master should consult the police before directing the removal of dangerous substances from the port. It is important to consider the roles of the emergency services and their capabilities, which differ around the country. The harbour authority must designate a parking area for road vehicles carrying dangerous substances.

EXPLOSIVES

5.2.8 It will almost certainly be the case that if the harbour authority handles explosives then an explosives licence will be required. Explosives licences are issued by the HSE, the procedure for application is set out in Schedule 7 of the DSHAR. The harbour authority must have a separate explosives plan. The harbour authority must appoint an Explosives Security Officer if explosives are being handled. The harbour authority must keep a record for a period of 5 years of all explosives handled.

5.2.9 The harbour authority may also be classified as the berth operator and owner. Under these circumstances they should take all precautions to minimise the effects of fire and explosion. Adequate access to berths must be ensured at all times.

5.3 Oil pollution and dangerous vessels

5.3.1 The code makes a number of references to oil spills:

- paragraph 1.3.6 says that the Secretary of State has power to give directions to a harbour authority, a harbour master, master of a vessel, pilot, or salvor or owner of a vessel, where an accident has occurred to or in a ship and, in his opinion, oil from the ship will or may cause pollution on a large scale;

- paragraph 1.3.6 also says that the Secretary of State, or persons authorised by him, may take any action they may direct to be taken; and that a representative of the Secretary of State (SOSREP) has been appointed to exercise these functions.

- paragraph 1.3.9 says that a harbour master may detain a vessel if they have reason to believe that it has committed an offence by discharging oil, or a mixture containing oil, into the waters of a harbour;

  all oil spills into harbour waters are to be reported and harbour masters have powers to board ships to investigate possible offences.

- paragraph 1.3.10 describes a duty on harbour authorities, under the Merchant Shipping (Oil Pollution Preparedness Response and Co-operation Convention) Regulations 1998 (the OPRC Regulations), to prepare a plan to respond to oil spills in their waters.

These references in the Code need to be read with separate guidance on oil pollution response – including on the role of the Secretary of State's representative (SOSREP) in the National Contingency Plan, and in guidelines for harbour authorities recently published as a supporting document.

5.3.2 It is good practice for management of the risk of oil pollution to be part of the overall safety management system for marine activities in the port. Measures to respond to pollution, should it arise, are an adjunct to that system, although a separate plan has to be approved by the Maritime and Coastguard Agency (MCA). Pollution response is difficult: it is good practice to minimise the risk of it occurring in the first place. A comprehensive approach therefore addresses both the risk and the required response.

SCOPE OF HARBOUR AUTHORITY RESPONSIBILITIES

5.3.3 The OPRC obligation arises if a port has oil handling facilities (of vessels over 400 GT or oil tankers over 150 GT), bunker vessels, or a turn over in excess of £1 million, The 1998 Regulations are now the principal legislation on counter pollution from a harbour authority perspective.

5.3.4 The obligation in the Regulations relates to pollution, or risk of pollution, by oil being discharged into harbour waters. The requirement is to plan to remove oil pollution from the harbour waters; and from structures owned by the harbour authority. The National Contingency Plan assumes that the cleaning of the shoreline is assigned to local authorities and the landowners; and port plans should do the same.

5.3.5 Harbour authorities should have in place sufficient equipment to adequately deal with what the Regulations term a Tier 1 response. They should also have in place a contract with a competent response company that has the capability to respond to what the Regulations term a Tier 2 spillage. The effect of these provisions is to limit the quantity of spilled oil for which a harbour authority must plan removal. Harbour authorities' plans may provide for a larger response capability, subject to approval to such plans.

RISK ASSESSMENT

5.3.6 As the earlier section on risk assessment has shown, risk requires consideration of both hazards and consequences. The process therefore begins with a potential pollution assessment: potential pollution depends upon what vessels use the port – or might resort to

it in an emergency. The assessment of consequences requires consideration of where in the harbour oil pollution is likely to occur; and where the oil is likely to cause damage.

5.3.6A The MCA and SOSREP are responsible for discharging an obligation under the Safety of Life at Sea Convention (SOLAS) to provide shelter for maritime casualties which may require use of waters within a port as a place of refuge. They aim to develop and maintain an assessment of potential refuges in all areas of the UK's territorial waters. In this connection, and to ensure a planned response to any incident, they will seek understandings with harbour authorities whose facilities might be called upon for this purpose. The help likely to be required will depend upon the port and passing traffic as well as the facilities likely to be available. It is therefore good practice for harbour authorities to plan for the reception of a casualty and to make any such plan an adjunct to their OPRC contingency plan, since the two will have many common elements.

GOVERNMENT SUPPORT FOR LARGE SPILLS (TIER 3)

5.3.7 Under the Merchant Shipping Act, the UK Government has prepared a National Contingency Plan to manage very large spillages. The plan is a good guide particularly on harbour authorities powers and SOSREP's function.

5.3.8 The Port Counter Pollution Plan should be complementary to the NCP for several obvious reasons. The pollution potential assessment might identify that spillages in excess of the Tier 2 limit may occur. In that event, unless the harbour authority also plans a response in excess of Tier 2, the Government's help under the National Contingency Plan is likely to be required. In any event, there is a power to intervene in all cases.

5.3.9 It is therefore very desirable to share the potential pollution assessment with SOSREP: they need to know – and ought to plan for – the localities where a danger has been identified of spillages beyond the local response capability. The harbour authority, in turn, needs to share such a plan, especially as it will always assume the use of harbour authority resources and personnel.

5.3.10 The National Contingency Plan assumes that, for an incident occurring inside a harbour authority's jurisdiction the harbour master will be in control of the incident response from the outset, although they may not remain so: command and control may pass to SOSREP – either because it is a very large spillage, or because powers of intervention have been exercised. It is crucial that harbour authority plans should deal with this. To avoid confusion in the course of an incident, it must be entirely clear how the harbour authority's resources (including its personnel) will fit under SOSREP's command and control. It is also very desirable to identify as clearly as practicable, in the harbour authority's plan, the circumstances in which that transfer of control is likely to occur.

CONSULTATION

5.3.11 Plans should be compiled in consultation with adjacent ports, Local Authorities, the Department for Environment Food and Rural Affairs (DEFRA), the Environment Agency and English Nature and their equivalents under the devolved administrations. The plan must then be submitted to the MCA for formal approval. Some of the agencies required to

be consulted have to prepare response plans of their own. They need the harbour authority's pollution potential assessment; and can assist greatly with the assessment of consequences. It is therefore good practice to involve them from the outset in the port plan: it is not good practice to make a first approach with a completed draft.

RESOURCES

5.3.12 A harbour authority should have an adequate number of proficiently trained personnel capable of managing a pollution incident. Additional resources needed to cope with a Tier 2 spillage can include mutual help agreements with other ports, oil companies and local authorities, and resources may also be available from oil spill contracting companies. There is no requirement for a harbour authority to actually have in place arrangements with a competent response company but there must be a formal agreement in place to ensure that a response will be guaranteed in the event of an accident. The harbour authority has to demonstrate in the plan and through the arrangements they have made that they can deal with a Tier 2 response. It is prudent to share with other local interests information about the external resources being relied upon – if only to ensure that they are double-counted. This also applies to SoS Rep's plans.

MERCHANT SHIPPING (PREVENTION OF OIL POLLUTION) REGULATIONS 1996

5.3.13 This legislation is directed mainly at a satisfactory operational capability of the vessel, when navigating within the vicinity of the coast. The harbour authority must report to the MCA any noticeable defect of a vessel when operating within harbour limits or when a pilot is on board. A reporting process needs to be established for pilots and port operations centres to ensure the harbour authority can comply with this legislation. Consideration will need to be given to a means of detecting defects on non-piloted vessels which may be sub-standard and not reported.

DANGEROUS VESSELS ACT 1985

5.3.14 Paragraph 1.3.7 of the code notes that, under this Act, a harbour master may give directions prohibiting the entry into, or requiring the removal from, the harbour of any vessel if, in his opinion, the condition of that vessel, or the nature or condition of anything it contains, is such that its presence in the harbour might involve a grave and imminent danger to the safety of persons or property or risk that the vessel may, by sinking or foundering in the harbour, prevent or seriously prejudice the use of the harbour by other vessels. The harbour master must have regard to all the circumstances and to the safety of any person or vessel.

5.3.15 Directions given under the Act by a harbour master may be over-ridden by the Secretary of State. This power is likely to be exercised through SOSREP, having assumed powers of intervention relating to the salvage of the casualty. It is good practice to use the formal statutory procedures, where appropriate, since they provide a framework for managing responsibility for a casualty.

5.4 Working with other authorities

5.4.1 Those preparing harbour authority emergency plans should consult other interested agencies from the start. They may be formally consulted before plans are submitted for formal approval, but that can be a formality if they were involved throughout. Many of these authorities also have statutory obligations to meet in their own right. The specific responsibilities of each authority can quickly be obtained from them.

POLICE

5.4.2 The role of the police is to:

- act as overall co-ordinators of any major incident on land;
- secure and protect the scene;
- investigate the incident;
- collect casualty information;
- identification of the dead on behalf of the coroner;
- prevent crime.

In the event of a major incident outside of the port area, which to all intents and purposes from police are private, then the police are overall co-ordinators but this is not the case in the event of a port marine incident.

EMERGENCY SERVICES

5.4.3 The harbour master, and the master of any vessel involved, should give every reasonable assistance to the fire, police ambulance and other emergency services for dealing with, alleviating or preventing any emergency. At any fire, the Senior Fire Brigade Officer shall have sole charge and control of all operations subject to the overall authority of the master if on board ship (Fire Services Act of 1947 and Fire Precautions Act 1971) although they are not in charge of ship safety and other matters within the marine sense. Not all fire brigades will respond to an offshore incident.

THE ENVIRONMENT AGENCY

5.4.4 The Environment Agency is a non-departmental public body with statutory duties and powers in relation to water resources, pollution control, flood defence, fisheries, recreation, conservation and navigation in England and Wales. Under the Water Resources Act 1991, the Environmental Protection Act 1990 and the Environment Act 1995. The Environment Agency is responsible for the control of pollution and water quality in all controlled waters;

which include ground waters, fresh waters, estuaries and relevant territorial waters (these extend 3 miles seaward from specific baselines).

5.4.5 It is recommended that harbour authorities enter into a Memorandum of Understanding in order to clarify the position of the respective agency or emergency service.

5.5 Health and safety at work

5.5.1 Management of Health and Safety at Work Regulations and the Health And Safety At Work Act place upon the harbour authority a duty of care to take all reasonable and practical measures to ensure the safety of employees and the public.

5.5.2 This ensures that the employer should plan to control all work activities that may give rise to endangering people, property or the environment.

5.5.3 The harbour authority should have in place a safety management system for controlled work such as:

- Hot work;
- Cold Work;
- Diving; and
- Entering enclosed spaces.

5.6 Search and rescue

5.6.1 It is the responsibility of HM Coastguard to co-ordinate the search and rescue phase of any distress within harbour limits. Harbour authorities provide support in various ways, for example the use of pilot boats in emergencies. HM Coastguard will assist a harbour authority and provide co-ordination in the search and rescue phase of any incident which is being carried out under the Port Emergency Plan. The harbour authority will remain responsible for managing the overall response to a port emergency. Some authorities have a Memorandum of Understanding with HM coastguard on lines of responsibility and communication in the event of a port incident.

5.7 National and other plans

MAJOR INCIDENT PLAN

5.7.1 In England and Wales the Home Office has instructed the Police to draw up a plan to manage a major incident. Its main *modus operandi* is based upon a tiered level of response:

- gold (strategic);
- silver (tactical); and
- bronze (operational).

The gold, silver and bronze categorisations relate to the function of the post rather than the seniority of the officer dealing with the emergency.

5.7.2 The plan works on the basis of mutual support with each organisation involved in the incident providing personnel to provide the relevant expertise.

SEARCH AND RESCUE

5.7.3 The MCA have a national plan to manage major seaborne incidents. This is an integrated response relying upon voluntary bodies such as the RNLI and local resources. Arrangements have been made with various fire services and the RAF to provide helicopter support.

REGIONAL PLANS

5.7.4 Each region within the UK has a Marine Rescue Co-ordinating Centre (MRCC) specifically designed to manage offshore and inshore incidents. The MRCC also has a resident Counter Pollution Officer for that region who is responsible for managing pollution incidents that occur outside Port Limits.

POLLUTION

5.7.5 Some areas have regional counter pollution plans, which have been compiled with the input of all relevant agencies they detail:

- sensitivity of information;
- prioritisation; and
- locations for shoreline response centres and marine response centres.

5.7.6 These plans act as an umbrella support to individual; port and organisational plans and provides a bridge to The NCP plan.

Local non-port Plans

- Environment Agency-flooding
- Chemical sites
- Local Authority

Port Plans

- SAR
- Counter pollution
- Salvage
- Media
- Disturbance
- Collision
- Grounding
- Sinking
- Fire
- Pollution
- Air pollution (Toxic cloud)
- Chemical spillage
- Bomb threat / terrorism
- Medical emergency
- Hazardous substances washed ashore

5.7.7 Good ideas about planning can be obtained from:

- Easingwold Emergency Planners College;
- Nautical Institute Publication *The Work of the Harbour Master;*
- local authority emergency planners;
- emergency services have dedicated personnel who will help (they will also advise what information they will expect from you);

- major organisations eg BP, Shell, and ICI etc, have dedicated departments who will provide advice; and

- visits to other ports and facilities.

Harbour authorities should plan generically as they cannot predict all possible incidents and prioritise those incidents that are most likely to happen and have the most severe effect upon their business.

5.7.8 Harbour authorities should consider the implications of external incidents eg a chemical plant having an incident creating a toxic plume that drifts across the port. It is important to consider all the port characteristics:

- tidal port or locks (in some cases both);

- type of industry in the port or close to it;

- types of cargo brought into the port;

- industry within the port; and

- environmental considerations to be considered.

PLAN DEVELOPMENT

5.7.9 The following areas should be considered in your planned approach:

- planning for existing facilities and vessels;

- planning for a new type of vessel or trade;

- planning a new facility within the port or close to it;

- planning for a major event;

- planning for an exercise; and

- planning for an emergency response and major incident.

It is worth considering that even the smallest of vessels can cause big problems. The plan should consider the size of the problem and how best to manage it, the following levels of port incident may help:

- minor – the harbour authority is capable of dealing with it with limited resources;

- port incident – requires additional resources/expertise;

- major incident – requires a large amount of resources and expertise.

CAPABILITY OF THE PORT

5.7.10 This will dictate whether the ports can manage an incident or even have the resources to carry out effective planning in house. The result of these deliberations will ultimately dictate a number of elements of the plan.

PLAN CONTENT

5.7.11
- location of Command and control;
- manpower;
- record keeping;
- event recording;
- financial records;
- resources;
- impact upon the business;
- cordons;
- security arrangements;
- specialists support;
- corporate image;
- external intervention;
- accommodation;
- documentation;
- continuity;
- good communications;
- picture building facilities;
- decision-making (pre-planned);
- the effect of events covering prolonged periods (Watch keeping);
- duty rostering and rest periods Location; and
- media.

TRAINING AND EXERCISES (*EXERCISE PLANNERS' GUIDE*. HOME OFFICE PRODUCTION)

5.7.12 **Training Exercises**

- seminar – good for rolling out new plans;
- table tops – very cost efficient, enables good control of the exercise and enables the 'big picture';
- control post – carried out in the work environment for small teams; and
- live exercise – large scale, enables 'real life' real time scenarios to run.

SECTION 6
Conservancy

6.1 Summary

6.1.1 Chapter 2.3 of the code describes the general requirements imposed upon a harbour authority under its conservancy duty:

A A harbour authority has a duty to conserve the harbour so that it is fit for use as a port, and a duty of reasonable care to see that the harbour is in a fit condition for a vessel to use it.

B Harbour authorities should provide users with adequate information about conditions in the harbour.

C Harbour authorities have duties and powers as local lighthouse authorities; and specific powers in relation to wrecks.

6.1.2 A description of the duty is found in paragraphs 1.2.4 and 1.2.5 of the code, reproduced here for ease of reference. A harbour authority has a duty to conserve the harbour so that it is reasonably fit for use as a port, and a duty of reasonable care to see that the harbour is in a fit condition for a vessel to resort to it. The code says that the conservancy duty covers several specific requirements:

a) to survey (and re-survey as regularly as necessary) and find the best navigable channel or channels;

b) to place and maintain navigation marks where they will be of the best advantage to navigation (marked appropriately by day and night);

c) to keep a 'vigilant watch' for any changes in the sea or river bed affecting the channel or channels and move or renew navigation marks as appropriate;

d) to keep proper hydrographic and hydrological records; and

e) to publish as conspicuously as possible such further information as will supplement the guidance given by navigation marks.

Where a harbour authority states that there is a certain depth of water at a part of the harbour over which vessels may be obliged to pass, it must use reasonable care to provide that the approaches to that part are sufficient, under normal conditions, or give warning that the advertised depth has not been maintained.

6.1.3 Conservancy includes not only monitoring but also protection of the hydrographic regime in a harbour, and so covers the licensing of construction and dredging in order that the safety of navigation is not adversely affected.

6.1.4 Conservancy therefore involves a number of functions, which are taken in turn in this Section of the guide:

- hydrography;
- promulgation of survey and navigation information;
- dredging;
- maintaining aids to navigation;
- managing wrecks; and
- regulating construction works.

6.2 Hydrography

THE GENERAL REQUIREMENTS OF A HYDROGRAPHIC SURVEY

6.2.1 In the context of this publication, hydrography is the precise determination of navigational information, and the provision of charts and other navigational products for use by the mariner and those with a responsibility for conservancy.

6.2.2 Detailed guidance on hydrography may be found in the International Hydrographic Organisation (IHO) publication, S44, *Standards for Hydrographic Surveys*. Practical guidance may be found in *Hydrography for the Surveyor and Engineer, 3rd Edition*, by A E Ingham; and the Nautical Institute publication, *The Harbour Master*. Guidance and advice can also be sought from the UK Hydrographic Office (tel 01823 337900).

POSITION

6.2.3 Survey data must be positioned relative to a geographical co-ordinate reference frame. Positions should normally be referred to WGS84 when using GPS systems and the UK National Grid for electronic or optical positioning systems. Local co-ordinate systems may be used for large scale work. Geodetic control observations may be required ashore to provide reference stations for satellite positioning systems, electronic or visual position fixing systems. The precise position of such stations should be known to an accuracy of at least that of the positioning system in use. If reference stations are established ashore they should be permanently marked and described for future use.

6.2.4 All positioning systems should be fully calibrated before the start of each survey. Additionally confidence checks should be conducted. Daily checks are recommended, however, checks should be conducted at least at the start and end of the survey.

BATHYMETRY

6.2.5 The entire survey area should be covered in a methodical manner. The pattern and spacing of survey lines should be carefully determined before commencing field operations. No irregularities in the depth must be overlooked and sounding density must be sufficient to discover all obstructions and shoals. If shoals are discovered then they must be investigated by running closely spaced sounding lines, to determine their likely extent. Leading lines must be sounded along and, where possible, a detailed examination undertaken using side scan sonar.

6.2.6 All soundings must be reduced to Chart Datum by applying observed tidal heights. See paragraph 6.2.10.

6.2.7 Echo sounders, both single and multi beam systems, should be carefully calibrated.

- **Single Beam Echo Sounder's (SBES)** should be calibrated by bar check to correct for index error and to ensure that the instrument reads the depth beneath the sea surface and not depth beneath the transducer. A bar check should be conducted at the start and end of each days observations to ensure consistency of data quality. In depths of less than 30 metres a bar check is sufficient to correct for the velocity of sound (SV) in water. In depths greater than 30 metres a mean SV for the water column should be observed and applied.

- **Multi Beam Echo Sounder (MBES)** systems require careful calibration before commencement of a survey and at regular intervals thereafter, although not daily as with SBES. Confidence checks against fixed targets, eg corner of a jetty, to check for time latency errors, and for example against a fixed bottom feature to check for motion sensing errors should be conducted daily. Errors associated with changes in the velocity of sound (SV) in water are particularly important when using MBES systems. The SV regime, both spacial and temporal, should be determined before sounding commences and carefully monitored throughout the survey. This is particularly important in areas where different types of water mass are encountered, eg river estuaries. SV observations in such areas may need to be conducted as frequently as every hour. MBES systems have greatly differing characteristics and therefore guidance should be sought from the manufacturer to ensure that the optimum ping rate and swath width are selected for the depth of water expected in the survey area.

6.2.8 Echo sounders, both single and multi beam, should be carefully calibrated. The former by means of a bar check to correct for index error and to ensure that the instrument reads the depth beneath the sea surface and not depth under the transducer. In both cases, and particularly when using a multibeam echo sounders, the velocity of sound (SV) in water should be carefully determined. In areas of differing types of water mass, eg in river estuaries, frequent observations for SV will be required to determine the changes across a survey area. When using a single beam echo sounder, a bar check is always to be conducted at the start and end of each working day. Similarly, as for the multibeam echo sounder

where differing types of water mass occur frequent monitoring of the SV will be required and the echo sounder adjusted accordingly.

WRECKS, OBSTRUCTIONS AND OTHER DANGERS TO NAVIGATION

6.2.9 The position of, and least depth over, every shoal, rock, bank, wreck and other obstructions that are a danger to safe navigation must be determined by close examination. The minimum depth is found using an echo sounder by total insonification of the obstruction, supported where possible by high definition side scan sonar. If necessary, in depths of less than 40 metres, wrecks and obstructions should be swept by wire or investigated by a diver to ensure a safe clearance depth. All dangers discovered during previous surveys or reported by other means must either be found and examined or positively disproved by an extensive and rigorous search.

TIDAL HEIGHTS AND TIDAL STREAMS

6.2.10 Observations of the rise and fall of the tide should be made both to reduce soundings to a common datum as well as to enable analysis of the predictions in the tide tables produced by the UK Hydrographic Office.

6.2.11 The means of obtaining tidal data, either by tide pole and/or tide gauge should be referenced to Ordnance Datum (Newlyn) and thus observed tidal data can be related directly to Chart Datum.

6.2.12 Tidal height observations can be obtained using a simple graduated tidepole and manually recorded throughout the survey to produce an observed tidal curve; or automatically using a recording tide gauge. Where automatic gauges are used a daily check against a tidepole should be conducted to ensure its correct operation. In turn the tide pole should have a reference mark on the structure to which it is secured to ensure that its position has not been disturbed.

6.2.13 Modern tide gauges usually incorporate temperature compensated pressure transducers which transmit readings via a telemetry link, thus enabling real time tidal heights to be monitored remotely and subsequently broadcast to vessels in the area. Where electronic monitoring and recording of tidal heights is available, it is also possible to compare the actual tidal height at any one time with that predicted, and to present any difference graphically. This is particularly useful in areas where tidal variations can be occasioned by meteorological conditions.

6.2.14 Measurements of the tidal stream and current will be required throughout the survey area.

COASTLINE AND TOPOGRAPHY

6.2.15 The position of the high and low water lines must be fixed and the nature of the foreshore described. All topographic features and conspicuous objects of any interest to the mariner that help them recognise the coast and determine their position must be carefully fixed. The heights of such objects must also be determined.

AIDS TO NAVIGATION

6.2.16 All aids to navigation, both fixed and floating, should have their positions accurately determined. Lighted fixed marks should have their sectors and characteristics regularly checked. The mean positions of floating marks should be determined from observations taken at full ebb and at full flood.

THE SURVEY PROCESS

6.2.17 The surveying process is divided into five major stages with each stage divided into a number of groups of instructions or procedures (Table 6.1).

Table 6.1 **Five stages of the surveying process**

Stage	Group	Instruction or Procedure
Preparation	Planning	• To extract current survey data from existing sources and plan observations.
	Calibration	• To eliminate systematic errors from survey instruments prior to observations.
Data Gathering	Verification	• To ensure that instruments are gathering data to the correct standard during survey operations by comparison with other instruments.
	Observation	• To make observations and check them on the survey line or in the field.
	Data Logging	• To store observed data and transfer to a data processing system.
Data Processing	Editing	• To ensure the removal of invalid data.
	Selection	• To select values from valid data for further processing or rendering.
	Data storage	• To store selected processed data in analogue or digital formats.
Data Analysis	Quality	• To determine the quality of surveyed data and compare it to the required standard.
	Coverage	• To determine that sufficient valid data has been surveyed.
Data Rendering	Reports	• To report dangers before the completed survey is rendered.
	Plots	• To render data as graphics.
	ROS	• To write the report of survey.
	Digital Data	• To render digital data.
	Field Records	• To render field records.

FREQUENCY OF SURVEY

6.2.18 The code (para 2.3.2) observes that the finding, marking and monitoring of the best navigable channel or channel in a harbour is an essential part of the formal hazard assessment and safety management system. The need for surveying, which may be time consuming and costly, should therefore be determined by a risk assessment. There needs to be a clear understanding between the harbour authority and any berth operator about responsibility for arranging surveys alongside a berth.

6.2.19 The frequency of surveys should be determined by formal risk assessment. It should reflect the stability of the sea bed and its susceptibility to siltation or erosion. The depth of available water, in relation to the draught of vessels using that water, is also a consideration. Given that the depth of water and stability of the seabed will often vary within a port, it is recommended that an overall survey plan be drawn up which meets the need for surveys at varying times in different areas.

6.2.20 Surveys are needed firstly to facilitate the production of charts. The intervals between surveys of the whole harbour below high water may vary from five to fifteen years. The interval may also be different for different parts of the harbour. There is no need to spend resources re-surveying areas known to be stable and efforts should also concentrate on the channels in use or areas where draught is relatively critical to users.

6.2.21 More frequent periodic surveys will therefore be necessary where the depth of water is known to fluctuate in areas critical to navigation. These periodic surveys are typically undertaken at intervals between one and twelve months. They should be included in the overall survey programme. These surveys need not be as comprehensive as a main survey and should aim to establish any variation since the last survey, thus enabling a warning to be given and any appropriate remedial action to be taken.

6.2.22 Incident assessments may also indicate a survey requirement. For example, where a vessel has grounded, it is important for the area to be re-surveyed as soon as possible to check the accuracy of published information; and to ensure that any resultant disturbance to the bed does not present a hazard to other vessels. It is also prudent in the event of a grounding, to establish promptly the depth of water available at the time of the incident in case of subsequent dispute. Post-incident surveys should also be conducted whenever there is a risk that the navigation channel has been compromised in some way, such as might happen when a large object is known to have fallen in the water. The conservancy duty demands that re-survey findings must be published in accordance with the guidance cited in this chapter.

6.3 Promulgation of survey and navigation information

6.3.1 A harbour authority is responsible to ensure that the mariner is provided with the necessary information to ensure the safe passage of his vessel throughout the port. It is vital therefore that procedures are in place to ensure the timely promulgation of such information.

6.3.2 The UK Hydrographic Office (UKHO) has the responsibility of compiling and publishing charts for all tidal waters around the UK, and the Admiralty Sailing Directions. The code (para 2.3.4) requires harbour authorities conducting surveys to arrange to provide the UKHO with the results of their surveys. It notes that the UKHO has a standard form of agreement for these arrangements. It has also published a code of practice on the provision of hydrographic information by ports – *Provision of Hydrographic Information – A Code of Practice for United Kingdom Ports and Harbours*.

6.3.3 A suitable warning must be given by the harbour authority as soon as they become aware, through survey or other means, that the water available to the mariner is less than that promulgated in nautical charts and publications. Such warnings will normally be broadcast by the harbour authority in the first instance over the appropriate VHF channel(s). Where a local Notice to Mariners is issued, distribution should include the UKHO, all pilots authorised by the authority, all current PEC holders and Masters of vessels not subject to compulsory pilotage where appropriate, and other Masters and vessels not subject to compulsory pilotage. Shipping agents also need to be included, so that they are alerted to the changes.

6.3.4 The UKHO will decide if the local Notice should be promulgated more widely as a chart-correcting Admiralty Notice to Mariners. In order to avoid the need for frequent chart corrections it is sensible to arrange with UKHO that in areas prone to depth fluctuations the minimum water available is that shown on the admiralty chart.

6.3.5 Where changes within harbour limits may impact on the safe navigation of passing coastal traffic or vessels approaching the port, harbour authorities, particularly local lighthouse authorities (see below), should inform the UKHO Radio Navigation Warning section. The UKHO will determine if a Coastal Navigation Warning will be issued on Navtex and/or through the Coastguard Coast Radio Stations. Such changes may include:

- Casualties to aids to navigation (see Section 6.5) particularly a principal Fairway Buoy or major Category 1 (see para 6.5.6.) lights with ranges beyond harbour limits;
- New wrecks or shoals and their marking located towards the outer limits of the port;
- Closure of a port or anchorage in exceptional circumstances; and
- The failure of local VHF radio navigation services.

The UKHO issues these warnings, but the Maritime and Coastguard Agency (MCA) is responsible for their transmission. MCA may invoice the appropriate authority for this service to help cover the costs. Authorities should therefore make provision for these expenses.

6.3.6 Where tidal heights vary significantly from that predicted, periodic warnings should be made over the appropriate VHF channel. Where tidal variations potentially affect vessels alongside or at a mooring, consideration should be given to alerting the relevant shipping agents if the vessel risks taking the ground or could otherwise be put at risk. In some areas, the tidal information available to a harbour authority may be useful for warning of possible local flooding. Arrangements should be made in such cases for the appropriate local authority and/or the Environment Agency to be informed.

6.4 Dredging

6.4.1 Harbour authorities typically have a statutory power in their local legislation to dredge for the maintenance and improvement of channels. The latter is commonly referred to as capital dredging, although the distinction between the two kinds may be blurred in practice.

MAINTENANCE DREDGING

6.4.2 For the purposes of this guide, maintenance dredging is that which is required to maintain existing access to the port and discharges the responsibility to ensure that all vessels using the port may do so safely. It is done on a routine basis to maintain the level of water at the depth advertised on charts. It is important that risk assessments deal with this requirement. Maintenance dredging should be planned for the sake of efficiency and to minimise environmental effects. Advertised depths should be determined – and reviewed – having regard to the need to ensure the safety of commercial and recreational vessels using the port. Water depth may be reduced to a level less than that charted, or otherwise promulgated, for example because no user any longer requires the charted depth to be maintained. However, appropriate warnings to mariners must be given and charts up-dated as soon as reasonably practicable.

CAPITAL DREDGING

6.4.3 Capital can take the form of deepening or widening an existing channel. Occasionally, it may be necessary to construct an entirely new channel to facilitate access to a new facility. Capital dredging for the purposes of this guide involves improvement of access for example to allow bigger and deeper vessels, longer optimum tidal windows and the provision of passing places, etc. Capital dredging may often be prompted by commercial considerations. However, a risk assessment might also identify a safety requirement for better access – even for vessels already using the port.

CONTROLS ON DREDGING

6.4.4 Where the Crown Estate or another person owns the bed of the harbour their permission for dredging operations is likely to be needed.

6.4.5 A harbour authority's statutory power to dredge is almost invariably subject to consent to dispose of dredged materials in tidal waters. This consent is required from DTLR (Ports Division) or its counterpart in the Scottish Executive's Transport Division and the Department for Regional Development in Northern Ireland. This requirement is usually found in the harbour authority's local legislation alongside the power to dredge. It mirrors – and takes the place of – the requirement in Part II of the Coast Protection Act 1949. The 1949 Act will also apply if dredging is proposed beyond the limit (usually the harbour limit) of the harbour authority's power to dredge. The consenting Department can advise which control applies. Capital dredging may require additional powers, for which a harbour order is required.

6.4.6 Consent to dredge is subject to the Harbour Works (Environmental Impact Assessment) Regulations 1999. The Directive which these regulations transpose imposes controls on 'projects'. This means that consideration must be given to the dredging and disposal of material, even though the consent requirement may relate to the disposal only. Consents may also be subject to the Habitats Regulations 2000, which impose severe restrictions and special tests on works which may adversely affect a European site. There are similar controls on harbour orders in Schedule 3 of the Harbours Act 1964 (as amended). It is even more likely in these cases that an environmental assessment will be required, or that adverse effects on a European site will have to be considered. Advice on environmental controls is found in Section 7 of this guide.

6.4.7 All applications for consent have to be advertised by the consenting Department and will take at least ten weeks after application and submission of all relevant information. The advertising periods are longer where an environmental assessment is required and decisions may take months. Early dialogue with the consenting Department is essential.

6.4.8 A licence to dispose of dredged spoil at sea must also first be obtained from DEFRA, in accordance with the Food and Environmental Protection Act. In Scotland the relevant regulatory body is the Scottish Executive Fisheries Research Service.

6.4.9 Seabed samples will be required from the areas in which it is proposed to dredge, for chemical analysis by DEFRA or the Scottish Executive. The means and location for spoil disposal must also be agreed and approved with all the relevant authorities. Early consultation with all parties concerned, including those who navigate or fish in the area is strongly advised.

DREDGING AND HYDROGRAPHY

6.4.10 It is good practice to undertake a hydrographic survey before dredging work commences and when it has been completed. This will establish the need and the basis for any contract, as well as ensuring that the contract has been fulfilled. Post dredging survey information should always be supplied to the UKHO. Locally produced charts should also be revised promptly after dredging work.

6.5 Aids to navigation

6.5.1 Paragraph 1.3.28 of the code explains that each harbour authority, and any other existing local lighthouse authority, is the local lighthouse authority (LLA) as regards their area. Every harbour authority has the power to carry out and maintain the marking or lighting of a harbour or any part of the harbour within the harbour authority's area or on harbour land.

GENERAL LIGHTHOUSE AUTHORITIES

6.5.2 The General Lighthouse Authorities (GLAs) have prepared guidance on the provision and maintenance of aids to navigation by LLAs. This guidance contains information concerning the revised local aids to navigation inspection regime that is to come into effect from January 2002.

6.5.3 The GLAs have the general superintendence and management of all lighthouses, buoys or beacons within their respective areas. They have a duty to inspect all lighthouses, buoys, beacons and other navigational aids belonging to or under the management of a local lighthouse authority (see para 6.5.5), and may give directions to a local lighthouse authority. A local lighthouse authority may not, without the GLA's consent, erect, remove or vary the character of any lighthouse, buoy or beacon.

6.5.4 The GLA for England and Wales is Trinity House. In Scotland, it is the Commissioners of Northern Lighthouses, and in Ireland, the Commissioners of Irish Lights. Where aids to navigation lie within the limits of a port, but are solely or mainly used by vessels transiting through the area en route to another port, then it is usual for the GLA to retain responsibility.

LOCAL LIGHTHOUSE AUTHORITIES

6.5.5 The LLA may have responsibility for providing and maintaining buoys and lights within its limits, but the establishment of a light or mark, or any alteration to existing lights and marks, may only be done with the approval of the GLA (see para 6.5.3). All approved alterations should be notified to the UKHO. Local lighthouse authorities and their officers should give to the General Lighthouse Authorities all such returns, explanations or information concerning the lighthouses, buoys and beacons under their management as the General Lighthouse Authority may require.

AVAILABILITY CRITERIA

6.5.6 All harbour authorities must establish and maintain aids to navigation within their area of responsibility in accordance with the availability criteria laid down by the GLAs unless otherwise agreed by the GLA. The code sets as a standard that the characteristics of local aids to navigation should comply with IALA Guidelines and recommendations. GLAs have a responsibility for ensuring that any aids to navigation within the port established and/or maintained by another party meet these standards. LLAs which are not harbour authorities must also categorise their aids to navigation on the basis of these criteria. The categories,

detailed below, are based on Guidelines developed by the International Association of Marine Aids to Navigation and Lighthouse Authorities. The three categories are to be applied according to the importance of a particular aid for safety of navigation:

CATEGORY AVAILABILITY

- Category 1 99.8%
- Category 2 99.0%
- Category 3 97.0%

6.5.7 Each LLA needs to adopt, state and accomplish the availability targets and response priorities for individual aids to navigation, in consultation with the GLA. Each LLA must therefore have clearly laid down procedures for responding to casualties to aids to navigation within timescales laid down by the GLAs, including those for issuing Notices to Mariners and notifying UKHO as described in this guide. Managers and operational staff whose duties involve aids to navigation provision and maintenance need to know these procedures. The GLAs have provided more detailed guidance and information to LLAs on availability targets and casualty response priorities.

GLA SUPERINTENDENCE

6.5.7A The GLA guidance also discusses reporting and inspection. They plan in future to rely more on the former and less on the latter than hitherto. quarterly reporting. They are happy to reach mutually acceptable reporting arrangements with harbour authorities unless they have good cause for concern – when they might well resort to an unannounced inspection. A reporting arrangement can be set up without cost to the authority. The GLAs have a CD – for which no charge is made – which includes a programme that makes it easy for an authority to monitor its aids systematically, and a 'press one button' reporting function. This function can be used by the authority's management system, and to generate an e-mail attachment allowing reports to the GLA without any effort.

6.5.8 Many devices are used to assist navigation in harbours, including navigation marks, lights, beacons and navigation buoys. These will be referred to collectively in this guide as aids to navigation.

6.5.9 Given the rapidly expanding technical developments now being made in the field of aids to navigation construction and performance, the advice of bona fide manufacturers should be sought when considering the installation of new aids to navigation. In particular, the availability of more efficient power sources is making possible the fitting of greater electronic payloads, including transponders and data transmission facilities, to isolated or floating aids to navigation.

6.5.10 Harbour authorities might consider using outside contractors for risk assessments of aids to navigation, and manufacturers can be asked for advice on the installation of aids to navigation. Care is needed that their recommendations are checked for compliance with IALA Recommendations and Guidelines; and that the level of provision of aids to

navigation is both appropriate and practical having regard to the identified risk. Provision has to be acceptable to the GLA and it is therefore recommended that their advice is sought before any consent or sanction is applied for under the appropriate legislation.

CASUALTIES AND ALTERATIONS

6.5.11 Harbour authorities, and LLAs that are not harbour authorities, are responsible for notifying users of casualties to any aids to navigation within the port. They are also responsible for notifying UKHO where appropriate. This notification should normally be by means of local broadcasts but may involve Coastal Navigational Warnings on Navtex and/or through the Coastguard Coast Radio stations. However, the issue of a local Notice to Mariners may be more appropriate in cases where the casualty is likely to take more than seven days to rectify.

In addition, alterations to aids to navigation must be notified to users and the UKHO, where such alterations affect the advertised characteristics of the aids to navigation. Wherever possible, this notification should be carried out in advance of any change taking place. The procedures laid down in respect of Notices to Mariners should take into account the UKHO timescales for publishing Admiralty Weekly Notices to Mariners.

6.6 Wrecks

6.6.1 In the event of a vessel becoming a wreck in or near the approaches to port limits, the process of removing the wreck is laid down in Section 252 of the Merchant Shipping Act 1995.

6.6.2 Paragraph 1.3.30 of the code says that harbour authorities must exercise their wreck marking and removal powers where, in their opinion, a wreck is – or is likely to become – an obstruction or danger to navigation. They have a duty to have regard to the environment in the exercise of this and all other duties and powers. Paragraph 2.3.9 says that a harbour authority's safety management system should require a risk assessment to be undertaken of any wreck in, or near the approaches to a harbour. The authority's powers to raise, remove, destroy and mark a wreck which is, or is likely to become, a danger to navigation should be exercised having regard to that assessment, with the aim of reducing the risk to as low as reasonably practicable. The UKHO should be informed of wrecks within port limits.

SALVAGE

6.6.3 A harbour authority may:

- take possession of, raise, remove or destroy the whole, or any part of the vessel, and any other property to which the power extends;
- light or buoy the vessel until it is raised, removed or destroyed; and
- subject to various restrictions, sell the vessel or part of the vessel so raised or removed and any other property recovered during the exercise of the above powers.

6.6.4 Harbour authorities may have additional powers under legislation other than S252 of the Merchant Shipping Act that enable them to recover the costs of wreck removal from the vessel owner, particularly where such costs are not covered by the proceeds of any sale.

6.6.5 If a vessel is abandoned, or if the owner has made no valid attempt to remove a vessel that has been sunk or stranded, then the harbour authority or conservancy authority may act to raise or remove or destroy the vessel if it is an obstruction or danger to navigation or to lifeboats engaged in the lifeboat service. It is recommended that before embarking on the removal of the vessel a harbour authority should ensure that:

- there is a well documented reason for the authority to require the removal of the vessel;
- that ownership of the vessel is established beyond any doubt or evidence obtained to show that the vessel has been abandoned;
- notice is given to the owner (if known), or posted on the vessel or in a public place that the authority intends to take possession of the vessel and raise, remove or destroy it (so that the owner has a reasonable opportunity to remove the vessel himself);
- any sale is well advertised in the local press;
- where the wreck has not sunk, and is still visible, a photographic record of the vessel's condition is made before any attempt is made to salvage it;
- if the vessel is beyond the salvage or dispersal capabilities of the authority, a reputable salvor or wreck removal contractor is engaged to carry out the work under a recognised wreck removal contract (wreckhire, wreckcon, wreckfixed, etc);
- it has suitable insurance to cover any residual liability;
- any such salvor or wreck removal contractor submits a detailed salvage plan covering;
- the method of raising the vessel including whether explosives are to be used;
- any temporary lay-by berth for the vessel;
- arrangements for limiting environmental damage;

- if pollution does occur, how it will be dealt with;
- agreed delivery location/beaching site/drying berth;
- diving operations connected with the salvage operation, and an assurance that they are to be carried out in accordance with the relevant diving regulations; and
- a suitable plan for the final disposal of the vessel, whether this involves sale of the entire vessel or part thereof.

6.6.5.A Section 5.3 in this Guide refers in several places to powers exercisable in relation to marine pollution by the Secretary of State's representative (SOSREP). These include powers in relation to the command and control of salvage. If the salvage of a wreck is associated with a risk of significant pollution, the harbour master must immediately inform HM Coastguard and intervention powers may be exercised directing the salvor to give SOSREP information. A decision on whether the salvor has the capability to carry out the necessary salvage actions, in terms of experience, personnel and material will be for SOSREP to determine and, if necessary, whether to set up a salvage control unit.

6.6.6 Harbour authorities and LLAs must therefore establish clearly defined procedures to deal with the timely raising, removal or dispersal to a safe clearance depth of a wreck which in their opinion is likely to become an obstruction or danger to navigation. These must include proper exercise of their powers to lay down emergency aids to navigation pending such raising, removal or dispersal. If it is impractical to arrange for such clearance, then the wreck must be permanently marked. Periodic surveys – including chain sweeps – should be carried out to verify the position of dangerous wrecks; to establish the current clearance depth over the wreck; and to help to review the marking requirements. Any aids to navigation laid to mark a dangerous wreck must be established and maintained in accordance with standards laid down by the GLAs. This will include availability categories casualty response priorities (see above).

6.7 Regulating harbour works

6.7.1 Some harbour authorities have the powers to license works where they extend below the high watermark, and are thus liable to have an effect on navigation. Such powers do not, however, usually extend to developments on the foreshore.

6.7.2 Some harbour authorities are statutory consultees for planning applications, as a function of owning the seabed, and thus being the adjacent landowner. Where this is not the case, harbour authorities should be alert to developments on shore that could adversely affect the safety of navigation. Where necessary, consideration should be given to requiring the planning applicants to conduct a risk assessment in order to establish that the safety of navigation is not about to be put at risk. Examples of where navigation could be so affected include:

- high constructions, which inhibit line of sight of microwave transmissions, or the performance of port radar, or interfere with the line of sight of aids to navigation;

- high constructions, which potentially affect wind patterns; and

- lighting of a shore development in such a manner that the night vision of mariners is impeded, or that navigation lights, either ashore and onboard vessels are masked, or made less conspicuous.

There is a British Standards Institution publication on Road Lighting, BS5489. Part 8 relates to a code of practice for lighting which may affect the safe use of aerodromes, railways, harbours and navigable Inland waterways.

SECTION 7
Management of Navigation

7.1 Summary

7.1.1 This Section of the guide is about the measures harbour authorities can use to manage navigation in their waters. The code concentrates on those available in statute, but there are others that are important, including agreements with users and education.

7.1.2 Paragraph 2.4.1 of the code sets out these general principles in relation to the management powers of harbour authorities:

A Ports have rules in byelaws and directions, which every user must obey as a condition of his or her right to use the harbour.

B Harbour authorities have a duty to make proper use of powers to make byelaws, and to give directions (including pilotage directions), to regulate all vessel movements in their waters.

C These powers should be exercised in support of the policies and procedures developed in the authority's safety management system, and should be used to manage the navigation of all vessels.

D Harbour authorities should have clear policies on the enforcement of directions, and should monitor compliance.

E Powers of direction should be used to require the use of port passage plans in appropriate cases – whether vessels are piloted or not.

PUBLIC RIGHT TO NAVIGATE

7.1.3 There is a general public right of navigation in tidal waters, subject to the payment of proper tolls and dues, and to the provisions of any laws regulating the operation of the harbour. (These laws may impose special restrictions on the otherwise general freedom of navigation.) It follows that a harbour authority's right to regulate the entry and movement of ships within the port to ensure safety of navigation must be conferred by statute. The code describes the related 'open port duty', and conservancy duty of harbour authorities (paras 1.2.2 to 1.2.5).

REGULATORY FUNCTIONS

7.1.4 The code also describes the various powers likely to be available for statutory regulation of navigation in a harbour. These may be in the harbour authority's statutes, in byelaws, in the power to give directions, or in general directions (see paras 1.2.8 to 1.3.5 and 2.4.2). General Directions are rules which apply to all ships within the harbour area.

7.2 Establishing the requirement

7.2.1 Every harbour is different, and the requirement to manage navigation varies from one to another. This guide can only deal with general principles of good practice. It recognises that sophisticated vessel traffic management systems are essential in some cases, but are neither affordable nor appropriate in many others. A formal assessment of navigational risk, as required by the code, will determine what management of navigation is required, and to what degree monitoring, controlling or managing traffic needs to play a role in mitigating risk. This assessment should address the additional risks potentially inherent in circumstances of reduced visibility.

7.2.2 Management of a harbour starts with deciding which activity is safe and where it can take place having regard to the physical constraints and the variety of activities in the harbour. Effective tools need to be in place which will ensure as far as practicable, that these decisions are carried through in practice.

7.2.3 These tools include: means of marking out the harbour, aids to navigation, anchorages, mooring areas, local charts, slipways and other landing points, etc. Some of these are covered in Section 6 of this guide. Rules will determine the use of channels, traffic separation schemes, compulsory pilotage, and other navigational regulations. These rules can, for example, include regulated navigation zones, collision avoidance rules, anchorage regulations, etc. Tools to facilitate communication between those managing the port and its users are also important. The main one is commonly referred to as Vessel Traffic Services, a term covering a wide diversity of sophistication. Written communication through local charts, Notices to Mariners, Port Handbooks, newsletters, etc are also valuable tools. These may all be supported in turn by dialogue with as many users as possible. This can be directly with individual users, or through agents, advisory committees, user groups and clubs, or other methods of education.

PORT CONTROL

7.2.4 A harbour authority's primary duty is to ensure the safe and efficient use of the harbour by those who have a right to use its facilities and navigate its waters. This includes a duty to regulate navigation using available powers and other means. Exercise of this function depends upon communication with users and is typically located where port communications from vessels are handled. The term 'port control', or Port Control Office, or Navigation Centre is thus commonly applied to this function.

7.2.5 The extent to which port control is required depends upon –

- traffic density;
- traffic patterns and intersections;
- port and river regimes, depth of water, sand banks, bars, shoaling patterns; meteorological conditions, tides and currents;
- hazardous and pollutant cargo trades;
- berth locations;
- proximity of the navigation channel to shore structures (particularly hazardous ones); and
- recreational craft.

7.2.6 When setting out to plan, monitor, or control, the movements of vessels, it is first necessary to establish the nature of the requirement, before looking at options for meeting it. The following questions are amongst those that need early answers.

- Where are the port boundaries?
- What powers does the harbour master hold?
- What trades and vessel types use the port?
- What numbers of vessels use the port and how often?
- Are there restrictions of tide/draught, weather, congestion?
- What are/should be the under keel clearances?
- Are there air draught restrictions from bridges, cables etc?
- To what degree is traffic monitoring/or control necessary in order to ensure safety?
- What are the options for achieving the required level of monitoring/control?

7.2.7 Clearly, the powers to regulate navigation are bounded by the port limits. Whether these are in the right place is a question the risk assessment should review. The need to regulate depends upon the vessels using the port, or likely to do so; and the hazards in the harbour from which they need to be protected. The hazards include the physical features of the harbour which determine where the navigation channels have to be. The weather and other traffic may require other restrictions to be imposed. Management is achieved by various means: observing, advising, educating as well as enforcing formal rules. The resources required to manage navigation effectively depend on the measures which need to be taken. These may be simple and inexpensive, or involve sophisticated equipment and specially trained operators.

PORT CONTROLLERS

7.2.8 Officers manning a Port Control, or VTS facility, and all operational staff, should be fully conversant with the disciplines and procedures required by their responsibilities; the level of service to be provided; and the overall structure and capability of the system. The chapter in this guide on occupational standards discusses the competencies and knowledge required.

ENFORCEMENT

7.2.9 Paragraphs 2.4.4 to 2.4.6 of the code make clear that byelaws and directions adopted in order to manage navigation risk should be backed by an appropriate policy on enforcement. The code also says that each authority should have a clear policy on prosecution, which is consistent with the safety assessment on which its directions are based.

7.2.10 It follows, therefore, that before making byelaws or General Directions, consideration needs to be given to the methods and resources available for enforcing them. Un-enforced regulations may give a false sense of comfort about the management of risks which they address.

7.2.11 Harbour master launches, or similarly identifiable port craft, can be very effective when patrolling the harbour in the locations, where recreational craft frequent. Their presence acts as a visible encouragement to the recreational user to navigate with care, whilst providing the means of enforcement should such action be necessary. Their presence also enables them to go to the assistance of any recreational users in difficulty or distress. Where Harbour Service personnel are used to enforce local rules, it is important that they are suitably trained to deal with the public, and also in the procedures to be followed should formal action become necessary.

7.2.12 It is helpful to the harbour authority to take opportunities to brief local Magistrates on the potential seriousness of byelaw infringements which create danger to navigation. It is recommended that attempts are made to do this through the local Clerk of the Court, and to arrange briefings and liaison visits as appropriate. It may also be appropriate to brief local police on port byelaws and the actions expected of them, in particular custody staff if for instance a vessel's master has to be arrested, detained or bailed. A port legal representative or local solicitor briefed and familiar with a port's byelaws and regulatory framework can be invaluable in such situations, where time is of the essence.

7.3 Vessel Traffic Services (VTS)

7.3.1 Paragraph 2.4.9 of the code acknowledges that harbour authorities use various methods to monitor and communicate with vessels using their harbour. It says that these should allow appropriate information, advice and directions to be passed between the harbour master or port control and ships in the harbour. Where the formal risk assessment indicates a requirement, the code says that a functional radar or radio-based vessel traffic services should be established and operated in accordance with internationally agreed guidelines.

7.3.2 The term Vessel Traffic Service (VTS) appears to be widely used to describe the function of monitoring traffic and communications between users and those managing them. As the code acknowledges, this function may be supported by various sophisticated equipment. The term VTS is not strictly limited to such cases, because similar principles apply whether a lot of equipment is used or not, but it is most commonly applied to such equipment and services provided with its help.

7.3.3 A VTS should comprise at least an information service and may also include other services, such as navigational assistance or a traffic organisation service, or both, defined as follows:

- **an information service** – ensures that essential information becomes available in time for on-board navigational decision-making;
- **a navigational assistance service** – assists on-board navigational decision-making and monitors its effects; and
- **a traffic organisation service** – prevents the development of dangerous maritime traffic situations and provides for the safe and efficient movement of vessel traffic within the VTS area.

TERMINOLOGY

7.3.4 The following terms are used in connection with vessel traffic services:

- **Vessel traffic service (VTS)** – a service designed to improve the safety and efficiency of vessel traffic and to protect the environment. The service allows the operating authority the capability to interact with the traffic and to respond to traffic situations developing in the VTS area;
- **Competent authority** – the authority made responsible, in whole or in part, for safety, including environmental safety, and the efficiency of vessel traffic and the protection of the environment;
- **VTS area** – the authority must delineate, and formally declare the service area of its VTS. A VTS area may be subdivided in sub-areas or sectors;
- **VTS centre** – the centre from which the VTS is operated. Each sub-area of the VTS may have its own sub-centre;
- **VTS operator** – an appropriately qualified person performing one or more tasks contributing to the VTS;
- **VTS sailing plan** – a plan which is mutually agreed between a VTS centre and the master of a vessel concerning the movement of the vessel in a VTS area. This will usually reflect the agreed pilotage passage plan; and
- **VTS traffic image** – where the VTS centre is using radar, the picture of vessels and their movements in a VTS area.

7.3.5 Port Control is a function exercised by the harbour master and/or designated deputies. Its function will include the VTS but it may be wider. In big estuaries, port control may involve more than one local port harbour master managing shipping movements in and out of specific ports.

7.3.6 The prime object of VTS is to provide vessels using a port with the necessary information, advice, or direction in order to achieve a safe passage from sea to berth and vice versa. In performing this function, those operating the system can also help maximise the efficient use of port facilities or constrained navigational channels, but this should be a secondary objective to that of ensuring safety. The over-riding duty of care must always be borne in mind when assessing priorities. The purpose of VTS is to improve the safety and efficiency of navigation; safety of life at sea; and the protection of the marine environment and/or adjacent shore area work sites and offshore installations from the possible adverse effects of maritime traffic. In so doing the VTS should comprise of at least an information service, and may also include others such as navigation assistance or traffic organisation service, or both.

7.3.7 Harbour authorities do not need special powers to equip themselves with VTS, since it simply serves as a tool to facilitate the exercise of powers and duties they already have. They do need to ensure that those who exercise the powers – from Port Control Offices or Navigation Centres – are properly empowered to do so. The associated responsibilities are diverse and will reflect in part the sophistication of the equipment available for monitoring navigation, as well as the navigational complexities of the port. What is common to all is the need for VTS staff to be well trained and have the necessary experience to assess fast moving situations; and to apply sound judgement in unexpected circumstances where pre-defined procedures do not apply.

7.3.8 An important distinction arises between the collecting and giving of information and advice (which is a two-way flow between those using the port and those managing it); and the giving of directions by or in the name of the harbour master. Communications need to identify whether they are information, advice or directions. Paragraph 2.4.5 of the code notes that it is important that the power to give directions is properly controlled by the delegation procedures adopted by the authority. Communications to vessels should be in a specific language which makes clear whether it is advice or a direction that is being given. Language needs to be clear and concise, avoiding jargon and colloquialisms.

FACILITIES AND PROCEDURES

7.3.9 The facilities and procedures employed in any port will differ according to:

- whether the port has direct and easy access to the open sea or whether it has a long approach channel;
- whether the port has dense traffic requiring a high degree of management and regulation, or has little traffic in which the risk of collision is minimal;
- whether the port is subject to tidal ranges, or other limitations which impose special conditions of entry or departure, eg locks, bridges and rivers;

- whether the vessels using the port are of widely differing characteristics, which as a result could have consequences for other navigation and require the assignment of specified channels, eg deep draught vessels;

- whether the cargo is handled with the ships at anchor, moored to buoys, or berthed alongside;

- types of cargo handled eg dangerous and pollutant goods (LNG, LPG, crude oil, chemical products in bulk, explosives, etc) and their effect on other navigation;

- numbers of recreational craft;

- presence of high speed craft, passenger ferries and local ferries; and

- availability, monitoring and potential overloading of port VHF frequencies.

7.3.10 VTS systems incorporating automatic vessel detection and tracking are more versatile than basic radar vessel monitoring equipment. Most incorporate electronic navigation charts, and are thus able to track vessels in relation to all charted features and not just those detectable by radar. They thus make possible more sophisticated forms of vessel traffic control and navigational assistance from shore.

GENERAL CONSIDERATIONS FOR VTS – OBJECTIVES

7.3.11 The purpose of VTS is to improve the safety and efficiency of navigation, safety of life at sea and the protection of the marine environment and/or the adjacent shore area, worksites and offshore installations from possible adverse effects of maritime traffic.

7.3.12 A clear distinction may need to be made between a port or harbour VTS and a coastal VTS. A port VTS is mainly concerned with vessel traffic to and from a port or harbour or harbours, while a coastal VTS is mainly concerned with vessel traffic passing through the area. A VTS could be a combination of both types. The type and level of service or services rendered could differ between both types of VTS; in a port or harbour VTS a navigational assistance service and/or a traffic organisation service is usually provided for, while in a coastal VTS usually only an information service is rendered.

7.3.13 VTS allows identification and monitoring of vessels, strategic planning of vessel movements and provision of navigational information and assistance. It can also manage the port's emergency response and assist in the prevention of pollution and co-ordination of a pollution response. The efficiency of VTS will depend on the reliability and continuity of communications and on the ability to provide good and unambiguous information. The quality of accident-prevention measures will depend on the system's capability of detecting a developing dangerous situation and on the ability to give timely warning of such dangers.

7.3.14 The precise objectives of any VTS system will depend upon the particular circumstances in the VTS area and the volume and character of maritime traffic.

VTS SERVICES

7.3.15 The following guidance concerning the services that are rendered by a VTS system should be taken into account:

- The information service is provided by broadcasting information at fixed times and intervals or when deemed necessary by the VTS or at the request of a vessel, and may include for example reports on the position, identity and intentions of other traffic; waterway conditions; weather; hazards; or any other factors that may influence the vessel's transit; and

- The navigational assistance service is especially important in difficult navigational or meteorological circumstances or in case of defects or deficiencies. This service is normally rendered at the request of a vessel or by the VTS when deemed necessary.

- The traffic organisation service concerns the operational management of traffic and the forward planning of vessel movements to prevent congestion and dangerous situations, and is particularly relevant in times of high traffic density or when the movement of special transports may affect the flow of other traffic. The service may also include establishing and operating a system of traffic clearances and/or VTS sailing plans, in relation to priority of movements, allocation of space, mandatory reporting of movements in the VTS area, routes to be followed, speed limits to be observed or other appropriate measures which are considered necessary by the VTS authority.

- When the VTS is authorised to issue instructions to vessels, these instructions should be result orientated only, leaving the details of execution, such as course to be steered or engine manoeuvres to be executed, to the master or pilot on board the vessel. Care should be taken that VTS operations do not encroach upon the master's responsibility for safe navigation, or disturb the traditional relationship between master and pilot.

- A VTS area can be divided into sectors, but these should be as few as possible. Area and sector boundaries should not be located where vessels normally alter course or manoeuvre; or where they are approaching areas of convergence or route junctions; or where there is crossing traffic. VTS centres in an area or sector should use a name identifier. The boundaries should be indicated in the appropriate nautical publications and in the *World VTS Guide*.

RECRUITMENT AND SELECTION

7.3.16 It is for authorities to decide recruitment standards for new VTS operators in terms of prior skills, knowledge, and personal suitability characteristics relevant to the tasks or functions they will be required to perform. These standards or the skills and knowledge requirements may in part be assessable through existing qualifications (eg Masters certificate of competence or pilot's authorisation).

7.3.17 VTS authorities may wish to consider introducing additional screening mechanisms to ensure that recruits have the necessary aptitudes and personal suitability characteristics relevant to the tasks or functions they will be assigned. These mechanisms will assess, *inter alia*, the ability to meet medical standards commensurate with the working conditions of the VTS position in

question, spacial problem-solving capabilities and other job-related aptitudes; ability to work under pressure and language capability required for the particular VTS.

QUALIFICATIONS

7.3.18 Authorities must be able to determine what competencies a VTS operator must possess to carry out assigned functions, in order to establish the combination of prior qualifications and subsequent training required to ensure that their operators are competent. National occupational standards based on IALA V-103 standards will be developed to provide guidance.

7.3.19 The standards will enable authorities to determine whether:

- VTS operators possess them in terms of their prior qualifications and experience and
- whether additional training will be needed to provide them.

7.4 Communicating with port traffic

7.4.1 Port control depends upon effective two-way communication between port personnel ashore and vessels using the harbour.

7.4.2 A number of different methods are used to monitor the movement of traffic within port areas. They include:

- visual observation;
- VHF surveillance;
- basic radar surveillance;
- VTS assisted automatic tracking;
- Closed Circuit Television (CCTV); and
- Automatic Identification System (AIS).

7.4.3 A person managing traffic movements in a port may use any of the following to communicate with waterborne users:

- visual signalling equipment (signal lights, shapes, etc);
- loudhailer equipment;
- telephones (fixed and mobile);

- Telex;
- VHF radio;
- e-mail; and
- data links (UAIS etc).

IN-PORT COMMUNICATIONS

7.4.4 In-port communication links are needed in addition to links provided for communication with vessels. These can typically include:

- VHF communications with tugs, pilot cutters, and other harbour craft;
- low power UHF radio for use in berthing/docking operations;
- high power UHF for transmission of transmission of data, such as GPS digital corrections for precision surveying, etc;
- computer networks and mobile telephones;
- fixed data links (analogue and digital) for transmission of remote sensor information; and
- fibre optic land lines for transmission of broad band sensor and other data.

PROCEDURES

7.4.5 Navigational information or assistance is most commonly provided as advice. In managing navigation, in the interests of safety however, it will often be necessary to require vessels to alter their navigation in some way. Such requirements may be expressed in the form of a request, but it should be made clear that the harbour master, or an assigned deputy has the power to issue special directions, and should consider doing so, if a vessel ignores, or declines to comply with a direction, for reasons other than safety. A good example is a special direction requiring a vessel to take a minimum number of adequately powered tugs in adverse weather conditions. In such circumstances it is important that staff have clear instructions, guidance or procedures on how to act and what is required of them. In order to dispel doubt in circumstances where a vessel master may have a poor command of English, consideration should be given to using "Message Markers" as defined in the IMO approved publication on Standard Marine Navigation Vocabulary.

7.4.6 It cannot be assumed that all port users will operate VHF and to make it a requirement is likely to be enforceable only where spot checks are practicable. Where VHF is widely used, there is also significant potential for cluttering up port VHF channels with unnecessary chatter. Users may need to be educated to maintain a listening watch and only speak when absolutely necessary. This can be achieved through recreational management plans and leisure user guides.

7.4.7 Modern VTS radar systems incorporate sophisticated tracking, way-time calculations and perimeter alerts which are more versatile than basic marine radar equipment. Most incorporate electronic charts and are thus able to track vessels in relation to all charted features and not just those detected by radar. They thus make possible more effective and efficient vessel traffic monitoring from shore.

INFORMATION SERVICES

7.4.8 An information service is most commonly provided by broadcasting information at fixed times and intervals or when deemed necessary by a VTS centre, or at the request of a vessel. Such information may include vessel and movement reports and intentions of other traffic, waterway conditions, weather, hazards, or any other factors that may have an influence.

7.5 Passage planning

THE CODE

7.5.1 The code says (para 2.4.1) that **harbour authorities' powers of direction should be used to require the use of port passage plans in appropriate cases – whether vessels are piloted or not.** Harbour authorities' and harbour masters' powers to regulate the time and manner of ships entry to, departure from and movement within their waters serve to complement port passage planning. The code therefore requires port passage plans to be operated and enforced as an adjunct to the powers of direction (para 2.4.10).

PORT PASSAGE GUIDANCE

7.5.2 Paragraph 2.4.11 of the code discusses the adoption by harbour authorities of port passage guidance as an adjunct to powers of direction. It says that this guidance is to be given legal force by the harbour authority's statutory powers. It is to be used in conjunction with master/pilot exchange forms, which ensure that both have information needed for an agreed pilotage passage plan.

7.5.3 The object of port passage guidance as required by the code is to ensure that:

- all parties know relevant details of any particular port passage in advance;
- there is a clear, shared understanding of potential hazards, margins of safety, and the ship's characteristics;
- intentions and required actions are agreed for the conduct of the port passage – including the use of tugs and their availability – and any significant deviation should it become necessary.

7.5.4 The code also proposes (para 2.4.13) that harbour authorities should use directions not only to require the use of plans, but also the advance preparation of appropriate passage plans by visiting ships' masters, whether using a pilot or not. The code requires authorities to monitor compliance with such requirements. Paragraph 2.4.18 makes clear that passage plans are not immutable. It is the responsibility of a pilot, on embarkation, to brief the master on his proposals for the "pilotage passage plan" within the pilotage area. This plan should be agreed with the master as soon as practicable. The plan will make allowance for any variations of tide and other local circumstances such as vessel movements, berth availability etc. It is important not to constrain the pilot's need to react to unforeseen circumstances; but deviations from the agreed plan should be discussed with the master and, when relevant, with port control, and recorded with reasons.

SCOPE OF PASSAGE PLANNING REQUIREMENTS

7.5.5 The use of passage planning is not confined to vessels conducted by a pilot, but should also be required for vessels conducted by the user of a pilotage exemption certificate, and on vessels excepted from an authority's pilotage directions. Passage plans may be dispensed with for particular kinds of vessel if the formal risk assessment has established that they are not necessary for the management of risk in such cases. As a general rule it is acceptable under the code to exclude those vessels for which the harbour authority's byelaws give sufficient control – for example, recreational vessels. There is, however, no objection to including such vessels if that is necessary and practicable.

ROLE OF HARBOUR AUTHORITY ON PORT PASSAGE GUIDANCE

7.5.6 Harbour authorities should take the lead in promoting the use of passage planning. They should take an overall view of the scope and content of passage plans for use in their areas. Published safety policies should state and justify the conclusion they reach. They should seek to establish general guidance – in simple cases for any entry to the port; in others, elaborated for particular berths, ship sizes, cargoes, conditions, tidal constraints, tug allocation, holding areas, etc. Particular attention should be paid to critical port movements, for example the movement of deep draught vessels to particular berths.

PUBLICATION OF PORT PASSAGE GUIDANCE

7.5.7 Authorities should take appropriate steps to publish up to date guidance or general plans adopted by the port.

PASSAGE RECORD KEEPING

7.5.8 Access to proper records makes it much easier for the port to monitor the port's safety management system, and to investigate incidents. It is also in the interest of all concerned that, in the event of an incident, it is possible to demonstrate that the master was properly briefed by the pilot (if one is used), and that there was an agreed pilotage passage plan. Plans adopted for particular passages should be recorded – ideally on the chart or other plan record. This is a routine duty of the bridge team. However, it is not necessary – or practical

for a harbour authority also to retain records on charts. Indeed, particularly in the case of an outbound vessel where the voyage is continuing, charts are not to be removed where this would put the master in breach of his statutory obligations. In the event of an incident, recordings of the VHF and the VTS track may well be enough to provide the critical evidence. There are examples of simple documentation, completed by the pilot and agreed with the master, which – together with a radar archive and other port control records – is likely to be sufficient for most purposes.

TRAFFIC ORGANISATION

7.5.9 It may be necessary to establish a traffic organisation service in the interests of safety, the management of traffic and the forward planning of vessel movements to prevent congestion and dangerous situations. Traffic organisation is a common means by which an assessed risk is to be mitigated – for example, by ensuring that vessels do not meet on a bend in the channel, or in constrained water; or by ensuring that vessels maintain the required separation from other vessels carrying dangerous cargoes etc. It follows that, where reliance is being placed on such traffic organisation to function in a manner prescribed in the safety management system, that clearly defined procedures are required, and that operators are fully compliant with their use.

7.5.10 Imprudent communication can increase risk rather than reduce it. For example, a VTS operator should not wait until the last minute before intervening in a situation which risks a close quarters situation between two or more ships in the VTS area. It is at just such a moment the masters of the vessels concerned are likely to require the urgent use of the VHF. If assisted collisions are to be avoided, careful guidance and training needs to be given to staff.

7.5.11 Traffic management should be assumed to include requiring vessels to adjust their passage plan in some way. Such requirements from a duly authorised port control officer or VTS operator might initially be in the form of information or advice. However, it needs to be clear that the harbour master has power and the VTS operator (as assigned deputy) has authority, if necessary, to issue instructions to vessels by means of a special direction. They should consider doing so if a vessel ignores or declines to comply with advice. It is important that staff have clear guidance and procedures for what is required of them and understand instructions should be result orientated only, leaving the detail of execution to the master or pilot on board the vessel.

7.6 Master/pilot exchange

7.6.1 IMO Assembly Resolution A485(xii) is being amended to include, at Annex 2, a summary of the respective responsibilities of master and pilot. It recommends that they should exchange information regarding navigational procedures, local conditions and the ship's characteristics, and that this information exchange should be a continuous process that generally continues for the duration of the pilotage. The pilot's presence on board does not relieve the master or officer in charge of the navigational watch from their duties and

obligations for the safety of the ship. It is important that, upon the pilot boarding the ship and before the pilotage commences, the pilot, the master and the bridge personnel are aware of their respective roles in the safe passage of the ship. The master, bridge officers and pilot share a responsibility for good communications and understanding of each other's role for the safe conduct of the vessel in pilotage waters. Masters and bridge officers have a duty to support the pilot and to ensure that his actions are monitored at all times.

7.6.1.A Port passage guidance provides a general framework for the preparation and agreement of specific passage plans for particular transits in the port. This preparation depends upon an exchange of information between master and pilot. This includes but goes further than the statutory requirements. The Pilotage Act 1987 requires a certain minimum exchange of information between the master of a ship and the pilot. In addition, the Merchant Shipping (Port State Control) Regulations 1995 (SI 1995 No. 3128) requires a pilot to report to the Port State (MCA), through his harbour authority where appropriate, any ship deficiencies that may affect its safe navigation.

7.6.2 The master/pilot exchange of information needs to be both detailed and structured, if the respective roles of the pilot and the master are to be integrated to best effect. It should include as a minimum the following.

- The provision by the pilot of detailed local navigational information, including his recommended pilotage passage plan – such details will assist the master to update his own plan and charts.

- Details on how the bridge is managed, and who fulfils what functions will also assist the pilot to integrate into the bridge 'team'.

- Presentation by the master to the pilot of a completed standard Pilot Card – in addition information should be provided on rate of turns at different speeds, turning circles, stopping distances and, if available, other appropriate data.

- General agreement on plans and procedures, including contingency plans, for the anticipated passage.

- Discussion of any special conditions such as weather, depth of water, tidal currents and marine traffic which may be expected during the passage.

- Discussion of any unusual ship-handling characteristics, machinery difficulties, navigational equipment problems or crew limitations which could affect the operation, handling or safe manoeuvring of the ship.

- Information on berthing arrangements; use, characteristics and number of tugs; mooring boats and other external facilities.

- Information on mooring arrangements.

- Confirmation of the language to be used on the bridge and with external parties.

This should ensure that the vessel has an agreed pilotage passage plan, and that the vessel's position can be monitored independently on the bridge whilst the pilot has the conduct of

the ship. It is not good practice to excuse 'regular runners' and others from passage planning requirements – and in any case, they should find it easier than strangers to a port or infrequent visitors. However, the notification requirements may be modified appropriately (eg limited to modifications to "standard" pilotage passage plans already on file).

7.6.3 In order to help avoid misunderstandings, and to overcome any possible language problems, an oral exchange between master and pilot should be complemented by written details. Such details will also facilitate the provision of a record of the exchange, should it ever be necessary to establish who said what. The paper based records should include the following:

Master to pilot	*The Pilot Card* This should provide, in clear, written/diagrammatic format all relevant information and details regarding the vessel and its equipment.
Pilot to master	*Pilotage Passage Plan* This should provide a written/chart/schematic containing all information relevant to the passage from pilot station to berth, including any tidal constraints and abort plans.
Pilot to CHA/MCA	Pilots have a statutory duty to report ship deficiencies that may affect adversely its safe navigation. These should be reported to the harbour authority which should, in turn, inform the MCA. (If any such defects are of major concern, the pilot should not commit the vessel to a passage in confined waters but instead abort the proposed movement to a place of safety).
Master to pilot	*HAZMAT checklist* The master of any vessel carrying dangerous or polluting goods must supply to the pilot an appropriate checklist. If the checklist is not satisfactorily completed, or it is not supplied, the pilot must report this fact to the harbour authority immediately. The harbour authority in turn must pass this information to the MCA.

7.6.4 Paragraph 2.5.27 of the code says that authorities or their agents should arrange for pilots to be allocated in adequate time to prepare passage plans. To comply with the code, harbour authorities or their agents should ensure that systems exist for the provision of relevant information for their pilots, and ensure that they operate properly.

7.7 Harbour service

7.7.1 Harbour service patrols can play an important role in the management of navigation within port limits. These craft have a wide range of functions, which will, to some extent depend upon the size of the port and the internal management structure. The management of such craft, and the standards to be applied, are discussed in Section 10.

7.7.2 Typically, the objects of a harbour service function include:

- maintaining a visual presence in the port area, and in so doing representing the harbour master on the water;
- enforcing port byelaws and Directions;
- collecting evidence following an incident and conducting preliminary investigations;
- conducting spot checks on vessel navigational documentation;
- assisting craft in difficulty, and responding to other emergencies;
- acting as Forward Control/On-Scene Commander respectively during port emergencies and SAR incidents;
- escorting vessel as required (eg vessels restricted in their ability to manoeuvre);
- control and Directing vessel traffic (eg during partial port closures);
- monitoring craft licensed by the harbour authority;
- monitoring jetty and other navigation lights and aids; and
- conducting routine surveillance of licensed works and moorings.

7.8 Recreational navigation

7.8.1 There is recreational activity in almost every harbour. In some it is predominant. It does present particular management requirements whether or not other forms of shipping activity are also present. The code says nothing specific about recreational activity.

7.8.2 Recreational users are not all well-trained, safety conscious, experienced boat handlers affiliated to local clubs; or the RYA; neither do they all have detailed knowledge of their harbour of residence. Harbour masters have traditionally given passage planning advice to recreational users without making a distinction regarding their affiliation or experience. There is, however, a real need in most harbours for educating recreational users about the harbour authority's role and responsibilities as they relate to different harbour functions.

7.8.3 Recreational navigation includes a wide range of differing activities and craft types, ranging from off-shore power boats, cabin cruisers, yachts, sailing dinghies, rowing sculls, canoes, personal watercraft, and water-ski boats. The requirements and priorities of such sports are often at variance – both with each other and with other harbour users and interests (including conservation of the environment). Good management, use of appropriate powers, and consultation are all needed to strike a balance. Conflicts can be resolved and it is recommended that such issues are approached openly, without bias, and demonstrably with the overall objective of ensuring the safety of navigation.

7.8.4 A risk assessment is likely to identify potential conflicts between both commercial and recreational users; as well as between different classes of recreational user. Many of these conflicts are best managed by arranging some form of segregation, bearing in mind that an authority's powers are to regulate – and not prohibit – the right of navigation.

7.8.5 Byelaws provide the main formal statutory mechanism for managing recreational navigation. Large recreational craft can also be subject to General Directions. Subjects typically covered include:

- requirement to maintain VHF communications;
- speed limitations in specified areas;
- prohibitions on defined recreational activities close to beaches, navigational channel, or environmentally sensitive areas,
- restrictions on the use of deep water channels by shallow draught vessels;
- navigation restrictions in the vicinity of specified port infrastructure; and
- establishment of zones for designated recreational activities.

7.8.6 When preparing byelaws and general directions, consultation with the recreational boating communities is strongly recommended, even if the byelaw or Direction in question does not directly affect recreational navigation. Accusations of bias towards one form of navigation at the expense of another are best countered by wide and open consultation in all matters.

7.8.7 Where risk assessment identifies a need to confine certain recreational activities, such as water skiing, or the use of personal water craft, to designated "zones", consideration needs to be given as to how such zones are to be marked, and how craft are to be permitted to access them. The size and location of such zones should permit the users to operate their craft safely and appropriately. They should only be established after full consultation with users and others potentially concerned, or affected, by the activity. Where zones are created for certain recreational activities such as water-skiing and personal watercraft use, consideration should be given to promoting appropriate qualifications to use them. Thus water-ski boat driver's qualifications (already well established) and personal watercraft qualifications (not so well established) would become the norm. This would answer many of the criticism's concerning uneducated and irresponsible use. It would also feature prominently in any risk assessment.

EVENT PLANNING

7.8.8 Harbour authorities may need to consult with organisers of recreational events in their waters about the need for risk assessments. The need will be proportional to the activity; harbour authorities may be able to agree that formal assessments are not needed for some low-key leisure activities. Those intending to hold a recreational event for which any form of risk assessment will be required should be encouraged to consult the harbour master at the earliest opportunity. Formal approval to such events can then be made subject to a proper risk assessment conducted by the event organiser. Where an event occurs regularly, the scope of subsequent risk assessments may be adjusted accordingly. In approving any event, the harbour master needs to be satisfied that risk to the safety of navigation, or other port users has been effectively mitigated. The harbour master also needs to ensure that the event organiser has consulted with, and has met the requirements of, the MCA (Coastguard), the RNLI, local emergency services, and local authority where appropriate. Also, if applicable the event should be conducted in accordance with the guidance provided by, and with the approval of, the national bodies representing the types or classes of craft or vessel participating. The RYA has prepared a series of standard templates for various categories of event and harbour authorities may wish to refer to these.

7.8.9 Any requirement for additional harbour authority resources, be they additional navigational marks, craft to patrol, control, or escort the event, or any emergency or SAR response resources, would normally be at the expense of the event organiser. The same would normally apply to any public safety or emergency provision considered necessary by the police or other emergency services.

7.8.10 Having conducted a risk assessment, and following any advice or requirement of the harbour master, the event organiser should be required to promulgate clear details of the event, including where appropriate:

- names of event organisers and officials;
- list of participants;
- list of authorities consulted;
- timetable and programme of events;
- arrangements for controlling the event, including any special communications, i.e. contact telephone numbers, VHF channels and call signs;
- any navigational constraints being imposed, eg restricted areas, or partial port closures;
- emergency arrangements; and
- media arrangements.

Depending on the scope of the event, it may be appropriate to publish also the full risk assessment and associated mitigating measures.

7.8.11 Where recreational events are a common feature of a harbour, consideration should be given to drawing up a code of practice for the planning and implementation of such events, thereby providing early guidance to any organisation so minded.

DIALOGUE WITH THE RECREATIONAL PORT USER

7.8.12 The co-operation of recreational users is best assured by comprehensive consultation and dialogue. To this end, harbour authorities should consider making available to all users of the port, including recreational users, published material of relevance to the safety of navigation, including the following:

- byelaws and general directions;
- notices to mariners;
- port guides;
- details of the facilities available to visiting recreational users;
- advice on passage planning, including the identification of any areas of high density recreational activity;
- port emergency arrangements; and
- the International Collision Regulations.

The promulgation of this information may be achieved by direct provision to local sailing and boating clubs, through articles and features in local press and radio, and by the use of notice boards in key locations.

7.8.13 The use of a web site will also greatly assist general awareness of the port and the details of its regulatory regime. In addition, such a medium is well suited to promulgating current operational issues such as details of relevant shipping movements, tidal data, etc.

7.8.14 Current operational information is usually broadcast to all port users, including recreational users so equipped, on VHF radio from the Port Control or VTS Centre where one exists.

7.8.15 Regular dialogue with the recreational users should also be achieved by means of liaison meetings, and participation on working groups and committees. With the advent of safety management systems, there is a need for all port users, including the recreational user, to contribute to the hazard identification and risk assessment process, and subsequently to assist in reviewing the safety of navigation. This can be achieved through the medium of appropriate local committees.

EDUCATION AND TRAINING

7.8.16 In discharging their responsibilities for the safety of navigation, harbour authorities should take a keen interest in helping to educate recreational users and others about safety on the water. To this end, they should encourage recreational users to attend training courses run by the RYA and other associations. They should also consider giving talks to selected groups of the local community on port operations and navigational safety issues. Additionally, the inclusion of educational information, and projects in support of local schools and colleges on a harbour authority's web site can be a most effective way of influencing prospective recreational users of the port.

FACILITIES FOR THE RECREATIONAL USER

7.8.17 Facilities provided for the recreational user often require specialised management. These include:

- moorings – design and specification of moorings and mooring areas, maintenance schedules etc;
- alongside berths – maintenance, access, security, collection of charges, provision of services, waste disposal, emergency arrangements etc;
- drying grids, safety inspections – maintenance of safe drying area including FEPA requirements for works below MHW;
- slipways – for launching/recovery of trailed craft. Requirement for maintenance and manning, supervision of launching and recovery where necessary, enforcement and collection, parking of trailers;
- slipways – for careening and repairs. Health & safety requirements, waste reception for contaminants;
- boat lifts, cranes, hoists – health & safety requirements, training for crane operators etc, storage, shoring arrangements ashore;
- provision of fuel – health & safety, pollution prevention, emergency procedures, formal safety inspections for installations;
- supply of electricity – health & safety, prevention of misuse, failsafe devices;
- shoreside services including showers, toilets etc – repair and maintenance, compliance with regulations, access for people with disabilities, security; and
- conservancy facilities in addition to those necessary for large vessels – marking of secondary channels, maintaining depth in secondary channels and other areas, removing obstructions in areas of recreational activity.

LEISURE MOORINGS

7.8.18 Harbour authorities are often required to provide, license, or regulate leisure moorings in order to meet demand, but also to facilitate the safety of navigation. A clear policy on areas to be used for leisure moorings should be established. This should take into consideration the need to:

- maintain safe navigational channels;
- ensure that a selected position takes into account size and type of craft, swinging areas, depths of water, type of seabed, and the need for safe access to and from the mooring areas; and
- ensure that environmental/hydrographic regimes are not adversely affected.

In providing or licensing moorings, consideration needs to be given to the design and construction of mooring gear. Moorings owned by the harbour authority must be fit for the purpose, regularly maintained and checked. Those licensed by the authority should be to minimum specifications laid down as guidelines or requirements.

7.8.19 A published mooring plan of each area of the harbour should be maintained, which clearly identifies the positions of all moorings.

7.8.20 In providing moorings and other facilities, a harbour authority should consider the use of contracts or agreements in order to ensure that any requirements for insurance, and other criteria are defined and met.

MARINAS

7.8.21 Establishing a marina within a harbour area requires careful planning and consultation. Local authority planning permission will almost certainly be required. The resulting density of boat traffic will need to be reflected in port pollution and other emergency plans. All marinas are required to put into operation waste reception management plans.

7.8.22 Traffic management procedures may be needed to facilitate entry into, and departure from, a marina. Lighting levels in and around a marina, whilst serving their purpose, must not impede the safety of navigation at night in the port area adjacent to a marina. Noise levels within marinas may need to be controlled.

7.8.23 Access to shore from a marina must be safe, and fit for purpose. The maintenance of life saving appliances throughout the marina is a fundamental responsibility of the marina operator.

7.8.24 An effective liaison needs to be maintained between a marina operator and the respective harbour authority. In particular, the movement of craft to and from a marina may need to be confirmed from marina records, which should be available for scrutiny by a harbour authority.

HOUSEBOATS

7.8.25 Some harbour authorities permit houseboats to be moored within the limits. Such permission is often controlled by licence, issued by the harbour authority. Before such a licence is granted, local planning permission may be required, as well as the approval of the riparian landowner. Adjacent landowners should also be consulted. Waste disposal facilities, including those for sewage, need to be provided.

SHORESIDE LIFE SAVING EQUIPMENT

7.8.26 The provision of shoreside life saving equipment is normally the responsibility of the relevant riparian land-owner, including, where appropriate, the harbour authority. The availability of such equipment should be taken into account when conducting risk assessments. Riparian authorities have a duty of care to ensure that adequate life saving equipment is made available, despite its vulnerability to abuse by vandals.

7.8.27 In principle, life saving equipment should be established as indicated by risk assessment. Such equipment should include recovery methods, means of raising the alarm and guidance on how to call the emergency services. The availability of RNLI assets should be taken into account when conducting risk assessment.

SECTION 8
Pilotage

8.1 Summary

8.1.1 Chapter 2.5 of the code is about the powers and duties which harbour authorities have to provide a pilotage service. It says that the use of these powers should follow these general principles:

A Harbour authorities are accountable for the duty to provide a pilotage service; and for keeping the need for pilotage and the service provided under constant and formal review.

B Harbour authorities should therefore exercise control over the provision of the service, including the use of pilotage directions, and the recruitment, authorisation, examination, employment status, and training of pilots.

C Pilotage should be fully integrated with other port safety services under harbour authority control.

D Authorised pilots are accountable to their authorising authority for the use they make of their authorisations: harbour authorities should have contracts with authorised pilots, regulating the conditions under which they work – including procedures for resolving disputes.

There is a separate chapter in the code (2.6) on pilotage exemption, considered below.

8.1.2 These chapters in the code include a fairly detailed account of the statutory duties under the 1987 Act and explain how harbour authorities were – or can be – designated as competent harbour authorities for the purposes of the Act. These Authorities have a duty to consider what pilotage services need to be provided.

8.2 The competent harbour authority

8.2.1 Competent harbour authorities should, through their Boards, play a formal role in the recruitment, training, authorisation and discipline of pilots. They should also approve the granting of Pilotage Exemption Certificates and the discipline of PEC holders. As statutory duties cannot normally be delegated to the executive, a mechanism will be needed which permits the Board to discharge these responsibilities.

8.2.2 It is likely that the harbour authority will delegate responsibility for the management of pilotage to the harbour master or another qualified executive officer, or in combination. These arrangements need to provide that the delegated powers are defined with clarity for each person; and the statutory role of the authority observed.

8.2.3 There may be cases where several ports in a location are best served by a single pilotage service. In this case, all the CHAs involved must agree the details concerning the provision of service. In the event of disagreement the Secretary of State can make a ruling, using powers in Section 12 of the Pilotage Act 1987.

8.3 Providing a service

8.3.1 The 1987 Act requires that the pilotage service provided by any harbour authority should be based upon a continuing process of risk assessment. The Act and the code requires that this process will be composed of the following elements:

- safety assessment**;**
- agents and joint arrangements;
- pilotage directions;
- boarding and landing;
- consultation;
- pilotage regulations;
- authorisation of pilots;
- contracts with authorised pilots;
- training;
- rostering pilots; and
- incident and disciplinary procedures.

SAFETY ASSESSMENT

8.3.2 Section 2(1) and 2(2) of the Act requires competent harbour authorities to keep under consideration :

a) whether any and, if so, what pilotage services need to be provided to secure the safety of ships navigating in or in the approaches to its harbour; and

b) whether in the interests of safety, pilotage should be compulsory for ships navigating in any part of that harbour or its approaches and, if so, for which ships and in which circumstances and what pilotage services need to be provided for those ships.

8.3.3 The hazards involved in the carriage of dangerous goods, pollutants or harmful substances by ship have to be particularly considered. These requirements are clearly best addressed as part of an authority's overall risk assessment and safety management system (see Section 4 of this guide). Competent harbour authorities were identified under the Act by means of criteria which included responsibilities for the regulation of shipping, and the safety of navigation. It is likely, therefore, that pilotage will need to be managed in the context of such wider responsibilities.

8.3.4 For the purposes of the safety management system, pilotage is to be treated as a risk reduction measure, to be considered with other possible measures to mitigate the risks in question. The decision under Section 2 of the Act is therefore to be taken in the context of available safety measures as a whole. There may be no need for a pilotage service where other measures are considered sufficient.

8.3.5 The authority has to be satisfied that a measure will be effective before relying on it. An authority with the powers to provide a competent pilotage service must be satisfied that it can do so competently. This means firstly that the authority has the competence to assess and oversee authorised pilots (and those who may apply for pilotage exemption certificates); and secondly, that they will have sufficient pilotage work to maintain their skills adequately.

8.3.6 It is important to note that an authority has two separate decisions to make:

- to identify the pilotage service required in the interests of safety (Section 2 of the Act); and

- the scope of pilotage directions (Section 7).

8.3.7 The service provided must obviously cover all vessels required to have a pilot by the directions. However, the authority must also consider two other points:

- that some vessels subject to directions may not require a pilot because the master or first mate is entitled to use a pilotage exemption certificate; and

- a vessel not subject to directions may nevertheless need a pilot in the interests of safety (for example in unusual conditions such as poor weather, reduced visibility, unfamiliarity with, or lack of knowledge of, the port or due to fatigue).

8.3.8 A master entitled to conduct their vessel under an exemption certificate may nevertheless ask for a pilot for assistance. The principal point to be remembered is that the authority has a duty to provide the service required in the interests of safety (not in terms of the service required by the pilotage directions). The requirement is of course determined through the safety management system, which may identify alternative risk reduction measures where pilotage, and pilotage directions, would otherwise be needed.

8.3.9 Section 2 of the 1987 Act does not admit financial considerations, or contemplate that an authority required to provide a service will not be able to maintain a competent one. (Pilotage competence requires exercise.) If these issues are likely to arise, the authority must include alternatives to pilotage in its assessment of risk reduction measures. If a risk is identified for which there is no satisfactory alternative to pilotage, the service provided must fully meet the requirements of the code. Thus it may be necessary to ensure that pilots retain the required currency and competence by tripping in vessels which are excepted from compulsory pilotage covered by a PEC holder.

8.3.10 An authority which identifies the need to provide a pilotage service, incurs an obligation to find and maintain the resources and expertise. The Act allows for a pilotage service in part of a harbour, if the risk assessment so indicates.

AGENTS AND JOINT ARRANGEMENTS

8.3.11 Paragraph 2.5.2 describes how an authority may arrange for certain pilotage functions to be exercised on its behalf by such other persons as its sees fit, including a company established for the purpose, or another harbour authority. The Secretary of State also has power to appoint one authority as competent harbour authority for another's area – a power not used to date. Two or more authorities may arrange to discharge such functions jointly. Under S11(2) of the Pilotage Act a competent harbour authority may assign all its pilotage functions other than the duty under 2(1) to another competent harbour authority. Otherwise, the following arrangements may not be assigned or shared:

- the duty to keep the need for pilotage under review;
- the authorisation of pilots;
- the arrangement under which its authorised pilots are engaged;
- the approval of pilot launches;
- the issue of pilotage directions; and
- the issue of exemption certificates.

These are all key elements of the safety management system required by this code. Paragraph 2.5.4 of the code suggests that more than one authority operating a joint arrangement for pilotage might consider having a joint safety management system. Authorities should also consider seeking a joint system for jetties and berths outside their jurisdiction, where their pilots may be providing a service.

PILOTAGE DIRECTIONS

8.3.12 If a competent harbour authority decides in the interests of safety that pilotage should be compulsory in the harbour or any part thereof, it must issue pilotage directions. This is a separate matter from the decision to provide a service. As noted above, an authority might decide to provide a service without making pilotage compulsory in some or all circumstances. Vessels are subjected to pilotage directions where the authority has decided that the management of safety so requires. Such vessels may nevertheless be conducted by PEC holders who have been assessed for skills, experience, local knowledge and knowledge of English. Authorities will need to satisfy themselves that the risks relating to vessels that are not subject to compulsory pilotage are appropriately managed. This applies both to vessels which the authority decides to exclude under its pilotage directions, as well as those excepted by statute.

8.3.13 The authority's pilotage directions have to define the geographic area within which pilotage is compulsory. A risk assessment should indicate where the limits of the area should be drawn. If risk is identified in an area outside the statutory limits of a port, then the code (para 1.4.5) points to provision for port limits to be formally extended by harbour revision order, so that the risk may be managed. There is special provision in the 1987 Act for such extensions for pilotage purposes only. The Harbours Act procedures allow for other purposes to be included (see para 1.4.4 in the code).

8.3.14 Pilotage directions describe how pilotage applies to vessels using the port. The content of the directions should be driven principally by the results of the risk assessment. Directions have to specify the ships or type of ship, and the geographical area, to which they apply; and in any circumstances in which an assistant pilot must accompany an authorised pilot.

8.3.15 Directions should specify vessel types. Ships have been specified in directions according to size (traditionally by length, but sometimes by draught, draft tonnage, beam etc). Risk assessments provide an opportunity to consider the relevance of such criteria – and others, and whether they are the right way of deciding which vessels present a risk which is appropriately managed by compulsory pilotage.

BOARDING AND LANDING

8.3.16 Attention is drawn to the British Ports Association's Code of Practice entitled *The Boarding and Landing of Pilots by Pilot Boat*. Pilotage directions may include "such supplementary provisions as the authority considers appropriate." This provision is used to designate pilot boarding and landing positions. The following considerations apply to the fixing of these positions, especially the seaward position:

- it must be in a safe place to transfer a pilot to and from a vessel;
- it must allow for a pilot to be on board where the pilotage directions so require; and
- it must be where there is sufficient time and sea room to allow a proper master – pilot information exchange.

Requirements might also vary according to different kinds of vessel – and for other temporary reasons, such as adverse weather. The Code makes clear (para 2.5.12) that there

is no power for the harbour authority – or for any pilot or port control officer to waive the pilotage directions. Pursuant to (2) above – but subject to the following two paragraphs, the boarding and landing position would normally be at the limit to which the relevant pilotage direction applies.

8.3.16A Section 7 of the 1987 Act allows for a range of circumstances to be accommodated by the pilotage directions. In particular, they may specify the area and circumstances in which a direction applies. Circumstances in which special arrangements might apply need to be identified in the risk assessment and reflected in the directions. These might include procedures in the event of a pilot not being available, for example because conditions make boarding and landing impracticable. Provisions might include the use of different boarding and landing positions for different circumstances.

8.3.16.B It should also be noted that Section 17(5)(b) of the Act contemplates that a person (other than the master or one of the crew of the ship) who is on the bridge of the ship *or in any other position* from which the ship is navigated (whether on the bridge *or elsewhere*) may be deemed to be piloting the ship. This contemplates a form of what is referred to as "remote pilotage" – **provided** that the person in question is an authorised pilot and can be considered to be "navigating" the ship. It may be appropriate to rely on this provision, for example, where the navigation can be conducted "elsewhere" than on the ship; and/or where the pilot transfer, boarding and landing, are assessed as too high a risk.

CONSULTATION

8.3.17 Before issuing a new direction, an authority must consult with ship owners whose vessels use the port, or those who represent them, and with those who conduct operations within the harbour (eg towage companies, pilots, etc). An authority should publish its directions so that they are readily available to all who require them, or are likely to be interested in them.

PILOTAGE REGULATIONS

8.3.18 Pilotage **directions** exist to define formally the broad structure of a pilotage service, and in particular to define where, and for whom, compulsory pilotage applies. Pilotage **regulations** provide a method of publishing administrative requirements and details which support these directions. These may include:

- arrangements for the application, assessment, approval, renewal and use of Pilotage Exemption Certificates;
- pilot authorisation procedures;
- any conditions governing the provision of the pilotage service;
- how vessels should obtain the services of a pilot;
- details of the local radio communications allocated for pilotage; and
- criteria for excepted ship status.

AUTHORISATION OF PILOTS

8.3.19 Each competent harbour authority may authorise suitably qualified pilots in its area. The 1987 Act says that authorisations may relate to ships of a particular description and to particular parts of the port. The authority determines the qualifications for authorisation in respect of age, medical fitness standards, time of service, local knowledge, skill, character and otherwise.

8.3.20 Paragraph 2.5.16 of the code says that authorities should establish proper arrangements for assessing competence, in accordance with the national occupational standards developed in parallel to this code and for keeping fitness under review. These should be published and available to applicants. Chapter 11 of this guide discusses how to apply the national occupational standards in order to comply with the requirements of the code.

8.3.21 Subject to the principle that it is for the harbour authority alone to decide (using appropriate procedures for delegation to its officers) that an authorisation should be given, it is for an authority, or its agent, to determine that a particular authorised pilot is appropriately qualified and fit to pilot any ship on any occasion. Authorities are accountable for these decisions. They and any agent should have discretion to decide not to allocate an authorised pilot for a period, or for particular ships, and this should be an accepted condition of every authorisation.

8.3.22 An authority may also suspend or revoke an authorisation after giving notice and allowing a reasonable opportunity for representations to be made, if it appears to the authority that the authorised person is guilty of any incompetence or misconduct affecting their capability as a pilot. The same applies if an authorised pilot has ceased to have the required qualifications; or level of medical fitness; or failed to provide evidence of continuing to meet any of the criteria. An authorisation may also be suspended or revoked, on reasonable notice, if any contract or other arrangement under which the services of pilots are provided is terminated. Authorities should have formal procedures for these circumstances, incorporated in the contracts they have with authorised pilots. It is obviously good practice and in the interests of all concerned, for authorities to act on legal advice in such matters.

8.3.23 Authorities should have procedures for re-validating authorisations not less than every five years. The code says that harbour authorities should not allow pilot authorisations to be held by persons who have not been rostered as working pilots for more than two years. Re-validation should include an assessment of competence sufficient to satisfy the authority that the pilot remains qualified to be authorised. The authority should consider re-assessing any authorised pilot who has not been active for any reason if it considers that competence may be in question. It should do that assessment, and arrange appropriate training, before allowing the pilot to be rostered.

CONTRACTS WITH AUTHORISED PILOTS

8.3.24 For the purposes of being able to regulate the provision of its pilotage service, each authority should have a contractual arrangement with its authorised pilots (whether under a contract of employment or a contract for services). This may be individual with each pilot or with an agent such as a pilot company. The contract should reflect the general conditions under which people are employed by the authority, including regulation of

hours, leave, medical standards, training, incident reporting, discipline, employment protection, grievance and complaints procedures. The purpose of the contract is to regulate the relationship between the authority and its pilots in the proper interests of both. In the authority's case, it should retain sufficient control over the provision of the service which it has a statutory duty to provide.

8.3.25 The Pilotage Act 1987 obliges harbour authorities assuming pilotage functions to offer authorised pilots employment. It is relieved of this obligation only if the majority of relevant licence holders agree it need not do so, but that agreement does not oblige the authority to offer an alternative or preclude it offering direct employment. The authority has to decide whether any alternative arrangements are acceptable. The authority is not allowed to delegate the decision on whether its pilots should be employed. Alternative arrangements have to be satisfactory to the authority, enabling it fully and freely to discharge all its statutory responsibilities for pilotage. An authority may refuse to authorise any person who does not accept the arrangements it has made for providing the pilotage service.

8.3.26 The contract between an authority and its authorised pilots should also take account of any contract the authority has made with another body or authority to have pilotage functions discharged on its behalf.

8.3.27 An authorised pilot's contract should enable the authority or its agent to decide that a particular pilot may, or should not be allocated to a particular ship on a particular occasion. Authorities should ensure that any arrangements by which the operation of the pilotage service is delegated, reserve their control over rostering.

TRAINING

8.3.28 Harbour authorities should ensure that all their authorised pilots are trained and qualified to conduct the vessels to which they are likely to be allocated. They should not allow any pilot to be allocated if not appropriately trained and qualified. The training standards should be appropriate to the National Occupational Standards developed in parallel with this code. Every authorised pilot's training needs to be kept under review, with additional training provided as necessary before allocation to different types of vessels or to the use of new types of tugs. It is good practice for shipping companies, particularly regularly trading ferries under PECs, to also participate in pilot training programmes. These programmes promote shared good practice and teamworking.

ROSTERING PILOTS

8.3.29 The shift patterns for any given pilotage service will vary depending on local circumstances, including the length of act, density of shipping, proximity of boarding and landing areas, etc. In designing shift patterns, care should be taken to ensure that pilots are suitably rested before commencing an act of pilotage, and that time has been allocated for the proper development of the pilotage passage plan.

8.3.30 The formal risk assessment should be used to identify any circumstances in which more than one pilot would be needed to conduct the navigation of a vessel safely.

INCIDENT AND DISCIPLINARY PROCEDURES

8.3.31 It is good practice for each authority to have a formal incident and discipline procedure in the event of a marine incident. This would be in addition to normal industrial incident and discipline procedures. It is good practice for harbour authorities to make provision for ship Masters to make reports, including confidential ones, of unsatisfactory performance by an authorised pilot, whether or not there has been an incident. Such provision must, however, be coupled with an equitable investigation procedure.

8.4 The Pilotage Exemption Certificates

As of 1 February 2002, there will be only three terms applicable to deck officers. These will be **master**, **chief mate** and **officer of the navigational watch**. However, there is no need for the Pilotage Act to be amended.

8.4.1 Chapter 2.6 of the code is about the powers and duties which harbour authorities have to exempt certain ships' officers from their requirements to take an authorised pilot. It says that the use of these powers should follow these general principles:

A The standards for exemption certificates must not be more onerous than those required for an authorised pilot; but they should be equivalent.

B Exemption certificate holders and their employers are accountable to the issuing harbour authority for the proper use of any certificate.

C Harbour authorities should have formal written agreements with certificate holders and their employers to regulate the use of certificates.

The requirements of a Pilotage Exemption Certificate (PEC) system are outlined in Part I, Sections 8 and 15, of the Pilotage Act 1987.

ELIGIBILITY FOR A PEC

8.4.2 The Act requires Competent Harbour Authorities (CHAs) to grant a PEC to applicants who are bona fide the master or first mate of a vessel. In practice, a large proportion of commercial shipping movements, especially ferries, are conducted by such officers with PECs. Many are highly trained and experienced – not only to be familiar with their ship but also harbours which they visit regularly. The arrangements whereby applicants may qualify, obtain, and use a PEC should be laid down in the pilotage regulations, which normally accompany the pilotage directions. The pilotage directions will specify the type and size of vessels which are subject to pilotage and therefore, by definition, the vessels to which PECs apply.

BONA FIDE MASTER AND FIRST MATE

8.4.3 The Pilotage Act requires that PECs are granted only to persons who are bona fide the master or first mate of a ship. This language recognises that practice on board varies. The chief officer is the person on board who will take command in the event of the master being indisposed. Some ships carry two mates and two masters, and often ships do not have articles which establish unambiguously that a particular officer is the first mate: whoever is the de-facto master/first mate at the time must be a PEC holder.

AWARD OF CERTIFICATES

8.4.4 Once the requirements have been determined, an applicant who satisfies them has a right to exemption whilst serving as bona fide master or first mate on the vessel for which they hold a certificate – whether they choose to use it or not. An authority can only withhold a certificate if an order under Section 8(3) of the 1987 Act has been made (see para 1.3.26 of the code). Paragraph 2.6.2 of the code says that authorities have a duty to issue pilotage exemption certificates to appropriately qualified mariners, and are not allowed to withhold one for reasons unconnected with an applicant's skill and experience, local knowledge and knowledge of English. A risk assessment may show for example that special requirements apply if the vessel were to take tugs. In that case, the authority has to choose whether it is reasonable to make the related skills a requirement for exemption; or whether to adopt an alternative risk management device. If the ship for which the master holds a PEC requires the services of tugs on a regular basis then this particular experience and ability should be covered with other relevant matters in the assessment prior to granting a PEC.

RESPONSIBILITY OF THE AUTHORITY

8.4.5 PECs are valid for one year from date of issue. Renewal should depend upon the CHA being satisfied with the conduct of the PEC holder. The PEC should only be renewed on confirmation that the holder's certificate of competency remains valid and that a predetermined number and frequency of trips, with conduct of the vessel, have been undertaken by the applicant within the harbour during the previous year. A system for recording all trips made by individual PEC holders will facilitate confirmation that the prescribed number of trips have been taken.

8.4.6 There must be procedures to ensure that a PEC holder's local knowledge is kept permanently up to date. It is recommended that in cases where a PEC is not renewed continuously, any subsequent application by the previous PEC holder should require a further assessment and/or examination. Where a PEC is continuously renewed, it is recommended that the holder should be fully reassessed, and/or re-examined every five years.

TRAINING

8.4.7 A CHA should offer the training and examination required without undue delay. The CHA should also provide to the PEC holder, and the PEC holder's employer relevant up-to-date navigation information.

8.4.8 Where applicable, it is also recommended that applicants be required to visit, and to be briefed on, the VTS system. A full appreciation of how such a system can monitor and record the detailed track and manoeuvres of every ship, will often encourage higher standards of navigation than otherwise might have been the case.

ASSESSMENT OF COMPETENCE

8.4.9 The qualifications required for exemption are determined by each CHA under its safety management system. Paragraph 2.6.3 of the code refers to national guidelines to be developed in parallel with the code. These have yet to be drafted or discussed with interested parties.

8.4.10 The user of a PEC conducts a vessel in a harbour in conditions where a pilot is normally required. The guidelines will identify – necessarily in general terms – the competencies and knowledge (general and local) agreed to be required to do this safely. These will cover what a PEC holder must know and be able to do. They will also set out an agreed assessment methodology for assessing how a CHA may be satisfied that the PEC holder has that competence and knowledge.

ASSESSMENT OF LOCAL KNOWLEDGE

8.4.11 The local knowledge can be assessed practically and by written and/or by oral examination. The level should be sufficient for the applicant to pilot his vessel with safety throughout the area covered by the PEC. It should also confirm that the applicant:

- has a good knowledge of local byelaws, directions and notices to mariners;
- has a comprehensive knowledge of all channels, and charted features, including navigation marks;
- is able to prepare and implement a pilotage passage plan;
- is aware of any navigational constraint or hazard that can arise, particularly in poor visibility, or unexpected tidal variation;
- has a working knowledge of port emergency plans, and how they potentially affect vessels in port; and
- is able to communicate effectively in English.

CERTIFICATES OF COMPETENCY

8.4.12 A mariner's level of skill is, in principle, confirmed by his or her certificate of competency. It is fundamental that PEC applicants hold valid certificate's of competency, which entitles them to hold the position as master or first mate in the ship(s) named in the application. Any guidelines which are agreed will need to include a statement of how far the possession of a certificate of competency may be taken to demonstrate the competencies and

knowledge required for pilotage exemption; together with a summary of the training and additional experience applicants may require.

8.4.13 Authorities are not bound to rely upon certificates of competency – from whatever country – as sufficient evidence of an applicant's suitability for exemption. It is good practice to confirm the overall competency of an applicant, together with his or her ability to communicate effectively in English, during a practical assessment of his or her local pilotage knowledge (see para 8.4.15). CHAs should also ensure that the applicant's certificate of competency – is applicable to the type and size of ship being navigated.

8.4.14 A master's, or first mate's certificate of competency should reflect achievement of a reliable and stringently examined standard in respect of the safe operation of a ship, and a minimum time spent at sea. It is not a record of service on ships of particular types and sizes. Experience of the relevant area, or part thereof, should be ensured by requiring PEC applicants to complete a number of training acts in the company of an authorised pilot, or the holder of a valid PEC for the area concerned.

PRACTICAL ASSESSMENT

8.4.15 It is good practice for shipping companies to ensure that officers seeking exemption have 'tripped' with a master holding a PEC or an authorised pilot before applying. It is good practice for a harbour authority to promulgate a requirement for such prior experience as part of the qualifications necessary for exemption. This will involve specifying a reasonable period over which the trips are undertaken and the number required in daylight and at night. It may also specify whether any trips should be undertaken with an authorised pilot, rather than a PEC holder. The proportion of inward trips to outward trips might also be defined. In order to minimise the risk of qualifying trips being falsely claimed or denied, the use of a tripping log is recommended, so that the accompanying pilot or PEC holder can countersign to the effect that the PEC applicant had responsibility for the navigation of the vessel throughout the qualifying trip. Tripping logs can also be validated by comparison with port records.

8.4.16 A CHA may not make qualifying for a PEC more onerous than qualifying for an authorisation as a pilot: the code says requirements should be 'equivalent'. It should be borne in mind that a PEC relates to one particular vessel whereas a pilot's authorisation can cover a wide range of different vessel types and sizes.

KNOWLEDGE OF ENGLISH

8.4.17 CHA's are required by the Pilotage Act, to consider whether a sufficient knowledge of English is required in the interest of safety. This may be ascertained during an oral examination or a practical assessment. Signed affirmations by third parties that the applicant's English is adequate should be avoided. Sufficient knowledge of English can be ascertained by the production of an education certificate, during tripping, and at the examination panel.

ADDITIONAL VESSELS

8.4.18 It is often the case that a PEC applicant will require his/her certificates to be valid for more than one vessel. However, where the other vessels involved differ significantly in size or manoeuvring characteristics, from that named in the original application, consideration should be given to requiring the applicant to demonstrate proficiency in those different vessels, before approving the addition of such vessels to his certificate. Should the holder require exemption for a vessel of different size/tonnage reassessment may be required. There is no reason to prohibit differing vessels being on the same PEC provided the holder has been adequately assessed for each one.

ADDITIONAL AREAS

8.4.19 A PEC holder may require that his certificate be extended to embrace additional areas of the port. In these circumstances, the requirements for additional tripping and/or further assessment should be specified in the pilotage directions, and should be fully satisfied before any such extension is approved.

AUTHORITY NOT TO GRANT A PEC

8.4.20 A CHA may apply to the Secretary of State to be allowed not to grant certificates, if the CHA believes that exceptional navigational hazards exist within its pilotage district, such that safety considerations dictates that all vessels navigating within the district must take an authorised pilot.

SUSPENSION OR REVOCATION OF A PEC

8.4.21 A CHA may suspend or revoke a PEC if it appears that the holder has been guilty of negligence, incompetence or misconduct. Before doing so, prior written warning of the suspension or revocation must be given, as must the right to make representations. It is recommended that the procedure for suspending, or revoking a PEC is documented in pilotage regulations.

8.4.22 This procedure can often be lengthy, even when the evidence supporting a charge of misconduct or incompetence is overwhelming. Meanwhile, the PEC holder remains legally authorised to continue conducting pilotage in accordance with his certificate. To overcome the obvious risk to safety inherent in these circumstances, consideration should be given to employing a letter of agreement between the CHA and the PEC holder and his employer, which defines the criteria to be met by the holder for his certificate to remain valid. Such a mechanism, following a serious incident and pending formal investigation and disciplinary processes, would allow a CHA, to invalidate a PEC immediately, and thus minimise the risk of safety being further compromised.

VESSELS OPERATED BY THE CHA

8.4.23 It should be noted that any vessels operated, or owned by the CHA, are also bound by pilotage directions and regulations.

SECTION 9
Marine Services

9.1 Summary

9.1.1 For the purposes of this guide, the term "marine services" is taken to mean the full range of support activities, which assist the harbour authority to maintain the safety of navigation, and to conserve the hydrographic regime. Some of these matters are dealt with elsewhere in this guide and this section gives guidance on:

- regulation of port craft;
- towage;
- work boats and berthing operations;
- salvage;
- diving operations;
- dredgers;
- bunker barges.

9.1.2 Paragraph 2.7.1 of the code puts forward these general principles in relation to marine services:

A An authority's safety management system should cover the use of harbour craft and the provision of moorings.

B The formal safety assessment should be used to identify the need for, and potential benefits for safety management, of harbour craft.

C The authority should ensure that harbour vessels or craft which are used in the harbour are fit for purpose and that crew are appropriately trained and qualified for the tasks they are likely to perform.

D Byelaws and the power to give directions are available for these purposes.

9.1.3 The range of marine services available, and the arrangements whereby they are provided, varies considerably from port to port. Some harbour authorities own and operate a full range of marine services. In others, services are provided by commercial organisations operating within, or close to the port. Some specialised services, such as salvage and diving,

will often have to be mobilised from other locations, and will not therefore be at immediate notice, unless previously contracted to meet a defined call-out time.

9.2 Regulation of port craft

9.2.1 National legislation requires craft which operate commercially "at sea", i.e. outside category C and D waters to be certificated and to comply with defined codes of practice, as follows.

- Merchant Shipping (Small Workboats and Pilot Boats) Regulations,1998, which enables the Code of Practice for the Safety of Small Workboats and Pilot Boats.
- Merchant Shipping (Vessels in Commercial Use for Sport or Pleasure) Regulations,1998 as amended, which enables the following codes of practice :
  - The Safety of Small Commercial Motor Boats,
  - The Safety of Small Commercial Sailing Vessels and
  - The Safety of Small Vessels in Commercial Use for Sport or Pleasure Operating from a Nominated Departure Point (NDP)

9.2.2 Where port craft are not subject to the above regulations, harbour authorities should have procedures, for ensuring that craft are properly maintained, properly equipped and manned by competent personnel. This procedure should apply equally to craft owned and operated by the harbour authority. Some harbour authorities are empowered by local legislation to register, inspect and license commercially operated port craft, which do not proceed to sea. If such powers do not exist, a risk assessment may show a need for some form of agreement with operators. A harbour authority may need to consider seeking the necessary powers to ensure that port craft are "fit for purpose".

9.2.3 In conducting inspections of port craft, it is important to achieve consistency in standards. It is therefore recommended that criteria be established, based where appropriate on the standards set nationally, against which inspections are made. These criteria should include minimum manning and competency standards, where applicable. They can also impose any geographical constraint, or restrict a vessels use according to its size and capabilities. In the case of all inspections, it will be necessary to record formally the outcome, and to notify craft owners of any failings. Where the level of inspection is beyond the resources, or professional competence, of the harbour authority, alternative arrangements for inspection and certification need to be identified which ensure that the same standards are applied. When certificating a craft, harbour authorities should be aware of the possible liability issues inherent in stating a craft to be "sea worthy", rather than "fit for purpose".

9.3 Towage

9.3.1 Paragraphs 2.7.2 to 2.7.6 of the code discuss the use of tugs. The need should be included in risk assessments; and towage guidelines should be developed and kept up-to-date. The guidelines should cover the competence and training of tug crew. Training of tug crew with other port personnel is advocated.

9.3.2 The capabilities of tugs found in commercial ports vary widely. In assessing whether a tug is "fit for purpose", it is prudent to specify with some accuracy what that purpose actually is. For example, not all tugs are equipped to conduct escorting. Similarly, many small craft tugs, whilst ideal for operating with barges and engineering plant in confined water, are not necessarily safe for ship towage or berthing operations. Care is needed not to authorise or sanction a tug for uses for which it is not designed. To this end, bollard pull certificates and specified towing equipment have a useful role to play.

9.3.3 Towage guidelines should be developed in consultation with pilots, tug operators and crew, and port users. The code also requires consultation with bodies who represent those who work in the port. Harbour authorities will need to keep their guidelines under review and periodically re-visit the associated aspects of their risk assessment, and safety management system. Close liaison between pilots, appropriate PEC holders and masters of exempted vessels, and tug crews based on joint participation in the safety management system and joint training is essential.

9.3.4 Guidelines need to be based on an objective assessment of safety, and take account of the conditions normally prevailing in the harbour and the manoeuvring characteristics of the various vessels using it. Towage guidelines, as currently used by harbour authorities, are generally advisory. However, where risk assessment indicates that an identified risk is reliant on a minimum level of towage being deployed in order to mitigate adequately that risk, consideration should be given to making that minimum level mandatory for those specific circumstances. Risk assessment is also likely to indicate whether active or passive escorting should be provided for certain operations. Tugs and towage are not always organised by the port – but by a terminal operator or by the ships using the service directly. Whoever has prime responsibility for such operations must ensure that all parties involved participate in the determination of such operations within the port. Towage Guidelines should be developed with only safety in mind.

9.3.5 Towage Guidelines should be made readily available to all vessel operators. They should be clear and explicit and kept under review. In particular, harbour masters should consider an appropriate special direction to mitigate risk likely to arise in instances where the guidelines are ignored, or where vessel masters have declined to take the recommended number of tugs.

FACTORS TO BE CONSIDERED IN DEVELOPING TOWAGE GUIDELINES

9.3.6 It is good practice to consider the following factors in developing towage guidelines:

- the geography of the port and its approaches, i.e. its navigational complexity;
- difficulties associated with particular berths, locks, bridges, etc;
- environmentally sensitive areas;
- the applicability of escorting;
- prevailing tidal stream and weather factors;
- size, type and manoeuvrability of ships using the port;
- whether movement of ships in and out of port needs to be facilitated by use of tugs (eg by using tugs for turning before or after berthing rather than own ship manoeuvring).

Towage Guidelines should specify:

- escorting requirements, active or passive;
- optimum/minimum numbers and size of tugs for a given size of ship and/or for particular berths;
- conditions under which it is acceptable not to use tugs;
- preferred method for securing tugs (if required for particular berths, locks etc);
- procedures for towage in fog;
- required levels of cross training between pilots and tugMasters and, where appropriate, PEC holders.

9.4 Workboats

9.4.1 Paragraph 2.7.9 of the code says that authorities should ensure that workboats used in their harbours comply with the Merchant Shipping (Small Work Boats and Pilot Boats) Regulations 1998 and the associated *Safety of Small Work Boats and Pilot Boats – a Code of Practice*, and that they are fit for purpose for any use to which they are put. Attention is also drawn to the British Ports Association's Code of Practice entitled *The Boarding and Landing of Pilots by Pilot Boat*.

9.4.2 The "fitness for purpose" of small workboats, which do not meet the criteria requiring national certification (see above), should be assessed and certificated by the relevant

harbour authority. This assessment would not normally include the working practices employed by such workboats, which can vary widely. Any vessel which goes to sea should comply with the relevant MCA code of safe practice.

9.4.3 Some harbour authorities have the powers to licence boatmen for, say, the purposes of running lines and assisting in the mooring of vessels. As a consequence, they are in a position, in the absence of national guidelines, to require such craft to operate in accordance with a locally developed code of practice. Such codes of practice have particular utility in circumstances where the operation being conducted by a workboat requires the participation of a greater number of personnel than that laid down for the navigation of the craft, and/or where the use of specialist safety equipment is necessary. Where a harbour authority does not have the power to license activities, and hence to insist on compliance with a local code of practice, or where the adoption of a code of practice cannot be achieved by agreement, consideration should be given to seeking the appropriate powers. A risk assessment should be used to identify where hazards exist, and where they are not being mitigated adequately. All activities undertaken by workboats should be the subject of a risk assessment.

9.5 Diving operations – regulation and management

9.5.1 The code makes no specific reference to diving operations.

COMMERCIAL DIVING

9.5.2 The Health and Safety Executive regulate commercial diving in the UK under the Diving at Work Regulations 1997. The Health and Safety Commission has produced a set of five ACOPs (Approved Codes of Practice), one for each section of the commercial diving industry. Typically work carried out in docks and harbours falls within the scope of the *Inland/Inshore ACOP*. This ACOP also covers operations connected with fish farming. Divers engaged in commercial operations must be qualified to HSE recognised standards (usually surface supplied) and operate within the approved code of practice.

9.5.3 There are a number of parties involved in any diving project all of whom have specific responsibilities. The HSE considers these to be:

- the diving contractor;
- the diving supervisor;
- the client; and
- others (eg vessel operators and owners of the site).

9.5.4 Briefly, harbour authorities which commission work with diving companies should:

- ensure that they appoint a diving contractor who is competent to undertake the duties;
- ensure that the site is safe to use;
- identify known hazards to the diving contractor, such as tides, currents, location of sluices and other underwater obstructions and contaminated water; and
- support the diving supervisor and diving contractor in the event of an emergency.

9.5.5 Where the harbour authority is not the client, it is recommended that the harbour master establishes a permit to work system for diving operations that are to be carried out within harbour limits and:

- ensures that the diving contractor is aware of known hazards within the diving area (sluices, intakes, ship movements, underwater obstructions, currents and tides etc);
- maintains records of meetings with the diving contractor; and
- follows the guidance on the Diving at Work Regulations contained in the PSO document Port Industry Guidance on the Diving at Work Regulations 1997.

Where the harbour authority is the diving contractor then the authority must comply with the provisions of the Diving at Work Regulations 1997 and the appropriate ACOP. Divers employed by the harbour authority are typically engaged in survey operations, construction work, clearing foul propellers and other underwater maintenance operations.

RECREATIONAL DIVING

9.5.6 The *Recreational Diving Projects* ACOP will apply when at least one of the divers involved in the diving project is at work. An example of this is when an instructor is employed to teach students.

9.5.7 The Diving at Work Regulations apply when at least one diver taking part is "at work". "At work" in this context means as an employee or as a self-employed person.

9.5.8 Clearing foul propellers would normally be considered to be a "work activity". However, if the work is undertaken by a sports diver who says that they receive no payment, then this usually places them outside the scope of the Diving at Work Regulations. That said, it is strongly recommended that the same rules are applied to those technically **not** "at work" as well as to those who are required to comply with the Regulations.

SECTION 10

National Occupational Standards for Port Marine Personnel

10.1.1 National occupational standards for port marine personnel are being developed in parallel with the code and this guide, These will cover:

- harbour masters;
- pilots; and
- port control/VTS.

10.1.2 British Ports Industry Training Board (BPIT) has produced National Occupational Standards which provide a basis for NVQ/SVQ Level 2 qualifications for the following:

- marine operations;
- passenger operations; and
- stevedoring.

PURPOSE OF OCCUPATIONAL STANDARDS

10.1.3 The *Port Marine Safety Code* represents an agreed national standard for the discharge by harbour authorities of legal marine safety functions. It fully recognises that local conditions vary from port to port in many different ways, and does not attempt to impose uniformity inappropriately. Harbour authorities all rely on professional people to carry out their responsibilities, and depend to a very large extent on the training and skills which those people apply. These may well not be shared with members of the harbour authority board. The code will not therefore succeed in achieving a national standard in practice unless authorities implementing it arrange that those to whom the relevant functions devolve are measured against similar standards.

10.1.4 The intention is to develop this part of the project in two parts:

- the national occupational standards; and
- an agreed assessment methodology to enable the standards to be applied.

The first part identifies **what** one needs to be able to do, and to know; the second **how** it can be established that those skills and that knowledge are held. These may have a range of applications – including the development of internal and external training courses; and for formal qualifications (as for tug crew) in due course. Their immediate use, however, will be for the selection of these assigned port marine safety functions.

10.1.5 Many of these people already have qualifications. It is widespread practice to require mariner qualifications for port professional positions. The code does not prescribe or proscribe such practice. It is, of course, true that a ship master and a harbour master or pilot are distinct jobs, albeit with much in common. The assessment methodologies to be developed in relation to the national occupational standards will identify the competencies and knowledge requirements which qualified mariners might be expected to have in order to assist the application of such qualifications in the authorities' procedures.

10.1.6 This guide does not duplicate the documents to be agreed in relation to the planned national occupational standards.

10.2 Harbour master

10.2.1 Paragraphs in 1.5.14 – 1.5.18 of the code give more detail on the appointment of harbour masters.

10.2.2 Harbour masters are a statutory appointment and harbour authorities' powers to appoint them are modelled on Clause 51 of the Harbours, Docks and Piers Clauses Act 1847. Clause 2 allows the term harbour master to include both the harbour master himself, and his assistants. The local legislation for most harbour authorities defines the term harbour master as including any person authorised by the harbour authority to act in the capacity of harbour master.

10.2.3 The harbour master in almost every case has a mix of statutory and management functions. For example, they have no statutory functions under the Pilotage Act but will commonly be manager of the service – if not also a pilot themselves. But many of the management duties are likely to relate to matters for which the harbour authority has a legal function. The role may be divided in different ways in some ports – both in relation to the statutory and managerial functions. It is therefore good practice to pay particular care to the definition of the harbour master's role in any harbour.

10.2.4 Once the work on defining the occupational standards required of harbour masters is complete, it is anticipated that marine training establishments will offer courses, approved at a national level, to those wishing to qualify formally as a harbour master. Meanwhile, the Nautical Institute currently runs a harbour master's Certificate Scheme, for those who want a foundation in the duties of a harbour master, which is based upon its publication *The Work of the Harbour Master – A Practical Guide*.

10.3 Pilot

10.3.1 Paragraphs 2.5.15 to 2.5.17 in the code and Section 8 of this guide, deal with the authorisation of pilots. Authorities have a power to determine the qualifications for authorisation in respect of age, physical fitness, time of service, local knowledge, skill, character and otherwise. The code says that authorities should establish proper arrangements for assessing competence, in accordance with the national occupational standards developed in parallel to this code; and for keeping fitness under review. These should be published and available to applicants. Authorities also need procedures for re-validating authorisations not less than every five years.

10.3.2 Harbour authorities should use clear assessment criteria, which set out the minimum standards to be achieved before initial authorisation and subsequent advancement to higher grades. When conducting interviews for pilotage selection and training, it is common practice for a pilot to be on the interview board, as they bring their expertise to the task evaluating the qualities required. These criteria should specify in detail the examinations, assessments, qualifying trips, and other experience required at each stage of a pilot's advancement. Competency, in vessels of the next higher grade, should be assessed before a pilot is advanced to that grade. Harbour authorities need to ensure that no pilot is assigned to conduct pilotage in a vessel, or in an area, for which they are not fully qualified and trained.

10.3.3 Where pilots are themselves used to examine or assess other pilots, consideration should be given to them being accompanied by a person other than a pilot, such as a harbour master, in order to avoid a possible misconception that the process is other than objective and in accordance with defined procedures.

10.3.4 Arrangements should be put in place to monitor the activity patterns of individual pilots to ensure that they are able to maintain the necessary local knowledge and expertise in each part of the pilotage district, and in each type and size of vessel for which they are authorised to undertake an act of pilotage. Arrangements may be needed to ensure that pilots can make good any gaps in their current experience before they are assigned to a vessel, or an act in a part of the district, with which they have become unfamiliar. The practical performance of pilots should also be monitored so that any weaknesses are identified early, and remedial training initiated.

10.3.5 In helping pilots to maintain their skill levels at the highest standard, it is essential that they are given the opportunity to train with others who contribute to safety such as VTS operators and tug crews. Training simulators, where available, can also play a useful and cost-effective role in helping to maintain currency in berthing and ship handling techniques, as well as providing a mechanism for exercising emergency situations. Training in the use of newly developed systems such as transponders; carry aboard and other electronic chart systems; should also be considered, where practicable.

10.3.6 Where an assessment gives reason to doubt a pilot's continuing competence, prompt arrangements should be made for refresher training. CHAs are advised not to allow pilots to be rostered for work if they have not been actively employed as a pilot within the last six months, unless suitable refresher training has been undertaken. Such training should be followed by a formal assessment of pilotage skills.

10.4 Vessel Traffic Service Operator

10.4.1 Section 8 of this guide discusses the management of navigation.

10.4.2 Paragraph 2.4.9 of the code notes that harbour authorities use various methods to monitor and communicate with vessels using their harbour. It says that these should allow appropriate information, advice and directions to be passed between the harbour master or port and ships in the harbour. Where the formal risk assessment indicates a requirement, a functional radar or radio based VTS should be established and operated in accordance with internationally agreed guidelines. These services may vary quite properly from port to port. The term VTS can be applied even to simple port control systems, although its common use is mainly for sophisticated vessel tracking systems.

10.4.3 Hitherto, vessel traffic management, in so far as it was practised in ports, was largely left to individual vessels, and their embarked pilots. Today, sophisticated vessel tracking systems and computer assisted vessel and tidal management programmes are being used in some ports to enhance safety in many ways, as well as optimising the use of port resources. Formal safety assessment may indicate that an identified risk can be mitigated most cost effectively by the introduction of a more elaborate traffic management system.

10.4.4 Until recently, the overall approach to related training has been largely ad hoc and ports have usually arranged their own training. This has taken the form of external courses, or in-house training, or a combination of both. Whatever method has been selected, considerable emphasis has usually been placed on subsequent on-the-job training.

10.4.5 The IMO STCW 1978 Convention was amended in 1995, including significant changes to include recommendations on VTS training. More recently, IMO Resolution A.857(20) provided guidelines on the recruitment, qualifications and training of VTS operators. The subsequent IALA recommendation V-103 provided detailed standards for the training and certification of VTS personnel. This recommendation also included details of a number of model courses; these are:

- Model course V-103/1 – VTS Operators
- Model course V-103/2 – VTS Supervisors
- Model course V-103/3 – On-the-Job Training

10.4.6 A UK VTS certification log is available to VTS operators following a structured MCA approved training programme based on the IALA V103 standard. This is not an entitlement to practice in a particular port as an authorised VTS operator. In all cases, this will be subject to successful completion of the harbour authority's on-the-job training assessment and examination. In all instances it is recommended that operators should undertake on-the-job training and assessment. The proposed national occupational standards, and related assessment criteria will support this. On successful assessment some harbour authorities now authorise their VTS operators in much the same way as pilots. This is not, of course, a statutory arrangement.

10.5 Marine Operatives

10.5.1 Paragraph 2.7.1 of the code says that an authority should ensure that harbour vessels or craft which are used in the harbour are fit for purpose and that crew are appropriately trained and qualified for the tasks they are likely to perform.

10.5.2 Marine operatives are employed in a wide variety of jobs throughout the ports industry. In deciding what qualifications are required, either as a prerequisite for recruitment, or following subsequent training, it is first necessary to analyse the jobs involved. The national vocational qualifications developed by BPIT cater for several of these. They also indicate the scope of training likely to be needed.

10.5.3 Other possible components of marine operative training include:

- basic sea survival;
- boat handling;
- emergency response;
- equipment handling, for example cranes, vehicles, alarms etc;
- first aid;
- information technology;
- personal safety;
- VHF operations and procedures; and
- basic marine engineering skills.

Additionally, the following certificates are available for marine operatives:

- MCA Boat Masters Licence; and
- RYA Coastal/YachtMaster Licence (with commercial endorsement).

10.5.4 It should be noted that STCW 95, which is brought into effect by the Merchant Shipping (Training and Certification) Regulations 1997 (S.I. 1997/348) on 1 February 2002, will introduce a Certificate for Inshore Craft, namely – Inshore Craft – Master Reg 11/3 (Restricted).

10.6 Tug Crews

10.6.1 As already noted, paragraph 2.7.1 of the Code says that an authority should ensure that harbour vessels or craft which are used in the harbour are fit for purpose and that crew are trained and qualified for the tasks they are likely to perform. Training programmes in respect of tug crew have been developed by the British Tugowners Association. Harbour authorities can ensure that tug crew working in their waters meet these standards through the towing guidelines discussed in the previous section.

10.6.2 Following the end of the transitional period for the implementation of STCW 95 on 1st February 2002, the certificates listed below will be required as a minimum for tug masters and deck watchkeepers aboard tugs over 24m in length and to engineers aboard tugs of more than 750kW registered power. Tug personnel with previous certification, and who have opted not to undertake futher training, will be allowed to continue to operate tugs in their port towage area and in their existing rank until 31st January 2005, provided their existing certificates are suitably endorsed by the MCA:

- Inshore Tug – Master Reg ll/3 (Restricted)
- Inshore Tug – Watchkeeper Reg ll/3 (Restricted)
- Inshore Tug – Chief Engineer Reg lll/2 (Restricted)
- Inshore Tug – Chief Engineer Reg lll/3 (Restricted)

10.7 Hydrographic Surveyor

10.7.1 Section 6 of this guide deals with hydrographic surveying. The need for in house hydrographic surveying skills will vary widely from port to port, depending upon the nature and the stability of the seabed and hydrographic regime.

10.7.2 Recognised hydrographic qualifications are probably unnecessary in cases where a port surveys solely to monitor the hydrographic data or charts published by others (eg UKHO). Where, however, it publishes survey data itself for use by the general public or sends the results of its surveys to the UKHO for inclusion into the official Admiralty chart, the training and qualifications of those who conduct the surveys and process the resultant data, should be demonstrably appropriate. Surveys should be conducted to the requirements of the International Hydrographic Office (IHO) SP44.

10.7.3 Professional qualification as a hydrographic surveyor, is normally either achieved by acquiring chartered status from the Royal Institution of Chartered Surveyors or by completion of an IHO Category A Hydrographic Surveying course. Harbour authorities looking to recruit personnel with a view to their achieving associate membership of the RICS, should bear in mind that a suitable foundation degree eg oceanography, marine or

land survey, information technology, etc or alternatively a Hydrographic Diploma, will normally be required. Membership of The Hydrographic Society is also recommended, as it offers many opportunities for continuing professional development through meetings workshops, conferences and publications. The Hydrographic Office offers guidance on the qualifications of hydrographic surveyors.

10.7.4 Where the above options are not appropriate, useful guidance is available from the International Hydrographic Bureau (IHB) in their publication *Standards of Competence for Hydrographic Surveyors*, which it publishes on behalf of the IHO and the Fédération Internationale des Géomètres (FIG). The IHO also publishes information on the training programmes of its member states.