

CHAPTER 9

Marine Department

Provision of port services

**Audit Commission
Hong Kong
23 October 2008**

This audit review was carried out under a set of guidelines tabled in the Provisional Legislative Council by the Chairman of the Public Accounts Committee on 11 February 1998. The guidelines were agreed between the Public Accounts Committee and the Director of Audit and accepted by the Government of the Hong Kong Special Administrative Region.

Report No. 51 of the Director of Audit contains 12 Chapters which are available on our website at <http://www.aud.gov.hk>.

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PROVISION OF PORT SERVICES

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PART 1: INTRODUCTION

1.1 This PART describes the background to the audit and outlines its objectives and scope.

Background

1.2 In 2007, some 4,800 ocean going vessels (OGVs) and 3,300 river trade vessels (RTVs — Note 1) made a total of about 228,000 visits to Hong Kong. Apart from these visiting vessels, there were some 14,000 locally licensed vessels (including passenger, fishing, cargo and pleasure vessels) operating in Hong Kong waters, making Hong Kong one of the busiest ports in the world.

1.3 The Marine Department (MD) is responsible for administering port and navigational matters in Hong Kong. The MD aims to achieve navigational safety and efficiency of shipping activities in the waters of Hong Kong by comprehensive vessel traffic management, harbour patrol and rigorous enforcement of local and international maritime regulations. In the financial year 2008-09, the estimated expenditure on port services was about \$325 million.

Port facilities and services

Vessel Traffic Centre

1.4 The MD's Vessel Traffic Centre (VTC) was established in 1989. Through its radar network, closed circuit television (CCTV) system and radio communication system, the VTC tracks and monitors the movement of vessels in Hong Kong waters. It also provides navigational information and advice to vessels to facilitate their arrivals, berthing, unberthing and departures.

Harbour patrol

1.5 The MD operates a fleet of 25 patrol launches. Each patrol launch is manned by two to three staff. The main duties of patrol launches include providing on-scene support to the VTC, enforcing marine laws and regulations, maintaining the safety of the port, and handling of maritime emergencies.

Note 1: *RTVs refer to those vessels (including high-speed passenger vessels and cargo vessels) travelling between Hong Kong and ports that are accessible from waters in its vicinity, which broadly include the Pearl River, Mirs Bay and Macau, and other inland waters in Guangdong and Guangxi.*

Aids to navigation

1.6 As at 31 December 2007, there were 533 aids to navigation scattered throughout Hong Kong waters to facilitate safe and efficient navigation. These aids to navigation include lighted buoys (Photograph 1), beacons (Photograph 2) and lighthouses (Photograph 3).

Photograph 1

A lighted buoy



Source: MD records

Photograph 2

A beacon



Source: MD records

Photograph 3

A lighthouse



Source: MD records

Mooring facilities

1.7 To meet the mooring needs of port users, the MD provides and maintains anchorage areas and mooring buoys. As at 31 December 2007, 31 mooring buoys (Photograph 4) and 24 anchorage areas (Photograph 5) were in operation.

Photograph 4

A mooring buoy



Source: MD records

Photograph 5

Vessels staying at an anchorage area



Source: MD records

Inspection of vessels visiting Hong Kong

1.8 Vessels with deficiencies may pose a hazard to marine safety and the environment. The MD regularly carries out inspections on vessels visiting Hong Kong to ensure that they meet international maritime standards in respect of marine safety, security and prevention of pollution.

Organisation and staff

1.9 As at 31 December 2007, 212 MD staff were deployed in the provision of the port services mentioned in paragraphs 1.4 to 1.8 above. An organisation chart (extract) showing the MD's units involved is at Appendix A.

Audit review

1.10 The Audit Commission (Audit) has recently conducted a review to examine the economy, efficiency and effectiveness of the provision of port services by the MD. The review focused on the following areas:

- (a) operation of the VTC (PART 2);
- (b) harbour patrol operation (PART 3);
- (c) maintenance of aids to navigation (PART 4);
- (d) provision of mooring facilities (PART 5);
- (e) inspection of vessels visiting Hong Kong (PART 6); and
- (f) performance measurement and reporting (PART 7).

1.11 Audit has found that there are areas where improvements can be made, and has made a number of recommendations to address the issues.

Acknowledgement

1.12 Audit would like to acknowledge with gratitude the full cooperation of the staff of the MD during the course of the audit review.

PART 2: OPERATION OF THE VESSEL TRAFFIC CENTRE

2.1 This PART examines the operation of the VTC and identifies areas where improvements could be made.

Vessel Traffic Centre

2.2 The VTC operates round-the-clock in shifts throughout the year. As at 31 December 2007, the VTC had a staff establishment of 64. To ensure the safety and efficiency of vessel traffic, the VTC carries out continuous traffic management and provides essential information to vessels. The VTC employs a computerised system to track and monitor vessel movements in Hong Kong waters. If a danger of collision is detected, the VTC uses its radio communication system to warn or advise the vessels concerned.

2.3 The VTC's computerised system is capable of receiving and displaying information transmitted by the Automatic Identification System (AIS — Note 2) of vessels. The computerised system consists of:

- (a) 12 radars to provide radar surveillance coverage of Hong Kong waters. These radars can track up to 4,000 moving and 1,000 stationary targets at any one time; and
- (b) 12 CCTV cameras installed at various locations to provide real-time visual images of vessel movements.

Quality management approach

2.4 The VTC adopts a quality management approach to maintaining the quality of its services, as follows:

- (a) ***Examination of marine incidents.*** Upon the occurrence of a marine incident, the Quality Assurance and Development Section (QADS) of the VTC will assign an officer to conduct an examination to determine whether there are areas that need improvement in the operation of the VTC. The examination report, after review by the supervisory officer of the QADS, will be forwarded to the VTC for taking follow-up actions, where appropriate; and

Note 2: *The AIS provides means for vessels to exchange data (such as identification, position, course and speed) with other vessels and the VTC. According to international convention, the AIS should be fitted in all OGVs of above 300 gross tonnage and passenger vessels regardless of size.*

- (b) ***Performance improvement exercises.*** These exercises include holding specific briefing sessions for staff about the lessons learned from marine incidents and the remedial measures taken.

Audit observations and recommendations

QADS examinations

2.5 In the past four years (2004 to 2007), QADS examinations were carried out on 107 marine incidents. The QADS found room for improvement in the operation of the VTC in 13 incidents. In the remaining 94 incidents, the QADS found that no further action was needed by the VTC.

2.6 ***Guidelines for conducting QADS examinations.*** An audit review of the QADS examination records of the 107 marine incidents revealed that no guidelines were laid down for conducting QADS examinations. In all the QADS examination reports reviewed by Audit, there was no documentation recording the examination procedures carried out and the underlying rationale for the observations and conclusions therein. Moreover, in 54 (57%) of the 94 QADS examination reports which concluded that no further action was needed by the VTC, there was no record showing that a supervisory review was carried out.

2.7 Audit considers that the MD needs to draw up guidelines for conducting QADS examinations to ensure that the examinations (including supervisory reviews) are properly carried out and documented.

2.8 ***Follow-up actions required to address deficiencies identified.*** In respect of the 13 cases over the past four years (4 in 2004, 4 in 2005, 5 in 2006 and 0 in 2007) where the QADS found that there was room for improvement in the operation of the VTC, Audit could not ascertain the follow-up actions taken to address the deficiencies identified in 9 of these cases. An example is given below for illustration.

Example

- (1) Two vessels collided in a marine incident in March 2006. The QADS found that at the time of collision, the visibility condition in Hong Kong waters was poor, for which a “safety message” concerning the poor visibility condition was being broadcast to all vessels. However, prior to the incident, no advice or warning about the danger of collision was given to the vessels involved.
- (2) Upon receiving the QADS examination report, the officer-in-charge of the VTC instructed his immediate subordinate to “consider feasible improvement measures”. His supervisor (an Assistant Director of the MD) also agreed with this instruction.

Audit findings

Audit could not find records showing that the VTC had come up with any feasible improvement measures. In response to Audit’s enquiry, in July 2008 the MD advised Audit that it put in place safety measures outside the context of the QADS report.

Source: MD records

2.9 ***Similar deficiencies were identified.*** Audit noted that the QADS made a total of 21 observations in the 13 cases mentioned in paragraph 2.8. Of these 21 observations, 19 (90%) were related to similar deficiencies which occurred a number of times from 2004 to 2007 (see Table 1). Examples of such deficiencies are given at Appendix B.

Table 1

**Deficiencies identified in QADS examination of marine incidents
(2004 to 2007)**

Deficiency	Number of times similar deficiencies were identified in QADS examinations
(a) Failure to give timely advice to vessels	8
(b) Failure to follow guidelines/ procedures after incidents	6
(c) Insufficient attention paid to collision warnings shown on radars	5
(d) Others	2
Total	21

Source: MD records

2.10 Audit is concerned that similar deficiencies occurred repeatedly. For example, in the past four years (2004 to 2007), there were eight incidents in which the VTC was found to have failed to give timely advice to vessels (see Table 1). There is a need for the VTC to take follow-up actions to address deficiencies identified.

Performance improvement exercises

2.11 The VTC advised Audit in December 2007 that performance improvement exercises (see para. 2.4(b)) were held from time to time. However, Audit could not find any records showing the dates on which such exercises were held, the number of participants and the issues discussed.

2.12 Audit considers that the VTC needs to improve the record keeping of its performance improvement exercises. There is also a need to assess the impact of the performance improvement exercises carried out for the purpose of planning future exercises.

Audit recommendations

2.13 **Audit has recommended that the Director of Marine should:**

- (a) **consider drawing up guidelines for conducting QADS examinations of marine incidents, setting out the need for supervisory review, the examination procedures and the documentation requirements;**
- (b) **improve the operation of the VTC by taking effective actions to address the deficiencies identified in QADS examinations; and**
- (c) **ensure that the performance improvement exercises on the operation of the VTC are properly documented, and their effectiveness is evaluated periodically.**

Response from the Administration

2.14 The **Director of Marine** agrees with the audit recommendations. He has said that the MD will review its quality management system and develop proper guidelines and procedures for the conduct of quality examinations of the VTC operations and the documentation of the improvements/follow-up actions.

PART 3: HARBOUR PATROL OPERATION

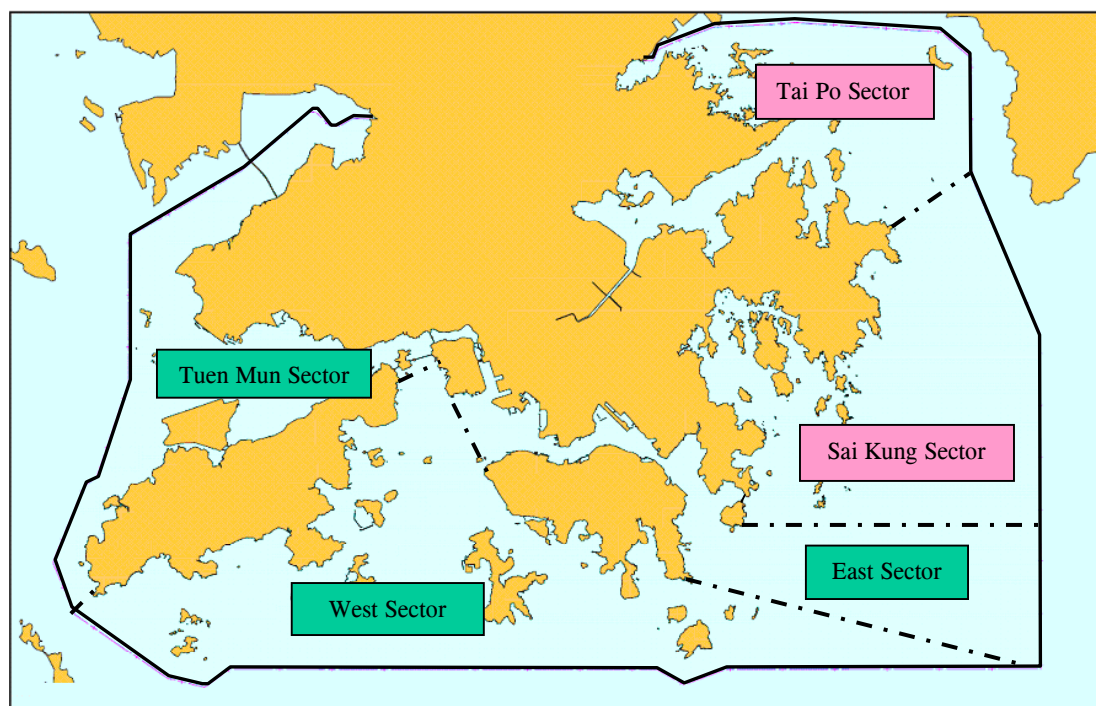
3.1 This PART examines the management of the MD's harbour patrol operation and identifies areas where improvements could be made.

Harbour patrol

3.2 For harbour patrol purposes, Hong Kong waters are divided into five sectors (see Figure 1). The Harbour Patrol Section (HPS) is responsible for the East Sector, the West Sector and the Tuen Mun Sector, while the Licensing and Port Formality Section (LPFS) is responsible for the Tai Po Sector and the Sai Kung Sector. They conduct regular patrols and special operations to regulate sea traffic, and ensure port users' compliance with local legislation and international maritime regulations/conventions.

Figure 1

Demarcation of patrol sectors



Legend: - - - - Sector boundary
— Hong Kong waters boundary
■ Sectors patrolled by the HPS
■ Sectors patrolled by the LPFS

Source: MD records

3.3 As at 31 December 2007, the HPS and the LPFS had a fleet of 21 and 4 patrol launches respectively (Photograph 6), each of which was manned by two to three staff. The patrol launches are responsible for:

- (a) conducting regular patrols within Hong Kong waters to ensure free access in all principal fairways, navigable channels and traffic separation schemes;
- (b) providing on-scene control of shipping movements and other port activities;
- (c) carrying out special operations against specific marine offences, such as speeding; and
- (d) attending to marine emergencies, such as ship fires and collisions.

Photograph 6

A patrol launch



Source: MD records

Supervision of regular patrols

3.4 According to HPS operating instructions, patrol officers on board patrol launches should maintain a continuous radio watch and report hourly to the HPS Operations Centre of their locations and activities. They are required to keep patrol log books to record the following particulars:

- (a) time and place of commencement of patrols;
- (b) time passing at certain reference points;
- (c) incidents or occurrences observed, details of vessels stopped for checking and the results of such checks; and
- (d) any other significant events.

3.5 HPS supervisory officers are required to review patrol log books twice a week and to conduct surprise checks. The supervisory officers also conduct “accompanying patrols” in which they accompany patrol officers in the regular patrols for monitoring and training purposes.

3.6 The supervisory practices adopted by the LPFS are slightly different. While LPFS patrol officers have to keep patrol log books, they are not required to report their locations and activities to the LPFS office. Moreover, LPFS supervisory officers are only required to review patrol log books once a month. They are not required to carry out any accompanying patrols or surprise checks.

Audit observations and recommendations

Compliance with operating instructions

3.7 While the HPS requires its supervisory officers to carry out accompanying patrols and surprise checks, the frequency of such patrols/checks is not specified.

3.8 Audit randomly selected and examined 34 patrol log books (30 from the HPS and 4 from the LPFS) covering the period May 2005 to September 2007. Audit found that there were **no** entries in the log books indicating that:

- (a) HPS supervisory officers had carried out accompanying patrols and surprise checks; and
- (b) HPS patrol officers had hourly reported their locations and activities, in accordance with the operating instructions.

Furthermore, of the 34 patrol log books examined, only one showed that it had been reviewed once by the responsible supervisory officer.

Use of automatic tracking devices

3.9 As at 31 December 2007, only five MD patrol launches were equipped with an AIS to enable supervisory officers to identify the whereabouts of the launches for monitoring purposes. Therefore, real-time monitoring of the whereabouts of other patrol launches has to rely on reporting by patrol officers. Audit notes that the MD is exploring ways (e.g. the Global Positioning System (GPS) technology) to track government vessels. However, as at 31 December 2007, no action plan had been laid down for the introduction of automatic tracking devices for the patrol launches.

Audit recommendations

3.10 **Audit has recommended that the Director of Marine should:**

- (a) **review the patrol launch operation with a view to improving the operating and supervisory arrangements of the HPS and the LPFS. Improvement measures may include, for example:**
 - (i) **standardising, as far as practicable, different requirements in the operating instructions of the HPS and the LPFS; and**
 - (ii) **considering the need to specify the frequency of accompanying patrols and surprise checks to be carried out;**
- (b) **ensure supervisory officers and patrol officers comply with laid-down operating instructions of the HPS and the LPFS; and**
- (c) **draw up an action plan with a view to introducing automatic tracking system for patrol launches as soon as possible.**

Response from the Administration

3.11 The **Director of Marine** agrees with the audit recommendations. He has said that:

- (a) a plan is in hand to unify all patrol functions under the HPS with standardised operating guidelines and procedures;
- (b) the frequency of accompanying patrols and surprise checks will also be specified in the unified HPS guidelines; and
- (c) the MD has developed a GPS tracking system for government launches on a trial basis with a terminal extended to the HPS for the monitoring of the patrol launches.

Special operations

3.12 Apart from carrying out regular harbour patrols, the HPS and the LPFS are also responsible for carrying out special operations to combat specific marine offences (e.g. speeding, and non-compliance with rules of vessel movements, such as travelling in an incorrect direction in a designated fairway). From 2004 to 2007, 84 special operations had been carried out.

Audit observations and recommendations

Planning

3.13 Audit noted that, as at 31 December 2007, no written guidelines or instructions were laid down regarding the planning process for special operations. In response to Audit's enquiry, the HPS and the LPFS advised in December 2007 that special operations were planned based on the experience and judgement of the officers-in-charge, taking into account:

- (a) the locations where there were a large number of marine incidents and complaints;
- (b) the irregularities/non-compliance which were identified to be main causes of marine incidents; and
- (c) the irregularities/non-compliance as reported in complaints.

3.14 Audit reviewed the special operations carried out during the period 2004 to 2007. The results indicated that the factors mentioned above might not have been duly taken into account in planning the special operations (see paras. 3.15 to 3.17). The MD may need to consider drawing up guidelines for special operations to ensure that relevant risk factors are taken into account during the planning process.

3.15 ***Locations of special operations.*** An audit analysis of the locations of 68 anti-speeding special operations carried out from 2004 to 2007 (see Appendix C) showed that:

- (a) no anti-speeding special operations were carried out in the two areas (i.e. Tai Tam Bay and Deep Water Bay) where the largest number of complaints against speeding was received; and
- (b) 14 (21%) operations were carried out in areas where no incidents or complaints involving speeding were recorded during the period.

3.16 ***Causes of marine incidents.*** Audit analysed the main causes of marine incidents based on the investigation reports compiled by the MD from 2004 to 2007. As shown in Table 2, “non-compliance with rules of vessel movements” was the most common cause of marine incidents. However, the number of special operations against such marine offences was considerably less than that against “speeding”.

Table 2
Special operations carried out to tackle cause of marine incidents
(2004 to 2007)

Cause of marine incidents	Number of incidents involved	Number of special operations carried out
Non-compliance with rules of vessel movements	20	22
Speeding	7	55
Non-compliance with licensing terms	8	0

Source: MD records

3.17 ***Complaints received.*** According to MD records, the top five causes of complaint from 2004 to 2007 were:

- (a) emitting excessive smoke;
- (b) illegal berthing;
- (c) oil pollution;
- (d) overloading; and
- (e) non-compliance with rules of vessel movements.

However, no special operations were carried out to tackle the top four causes of complaint (see Table 3).

Table 3
Special operations carried out to tackle complaints received
(2004 to 2007)

Cause of complaint	Number of complaints	Number of special operations
(a) Emitting excessive smoke	139	0
(b) Illegal berthing	18	0
(c) Oil pollution	17	0
(d) Overloading	14	0
(e) Non-compliance with rules of vessel movements	8	22

Source: MD records

Documentation of special operations

3.18 According to the operating instructions of the HPS and the LPFS, upon the completion of a special operation, an operation report should be prepared to record details such as the itinerary, patrol launches involved, actions taken and the results thereof.

3.19 An audit examination of the operation reports of 84 special operations carried out from 2004 to 2007 revealed that:

- (a) records of 3 (4%) operations were lost; and
- (b) operation results (e.g. number and details of vessels targeted or examined, and number of prosecutions made) were not documented for 18 (21%) operations.

Audit recommendations

3.20 **Audit has recommended that the Director of Marine should:**

- (a) **consider drawing up planning guidelines for special operations, ensuring that risk factors (e.g. past occurrence of marine incidents and complaints received) are taken into account; and**
- (b) **keep complete and accurate records for all special operations.**

Response from the Administration

3.21 The **Director of Marine** agrees with the audit recommendations. He has said that:

- (a) in considering mounting special operations, the priority of the MD is to safeguard the safety of the harbour and other port users. Hence, the risk factor of speeding will have a higher weighting than others. That said, the MD will draw up guidelines which take account of the prevailing circumstances, priority of work and available resources;
- (b) future special operations will be initiated based on risk factors and the guidelines mentioned in (a) above; and
- (c) the HPS will ensure proper recording of the operations.

Handling of prosecution cases

3.22 If a suspected offence is detected during regular patrols or special operations, patrol officers are required to collect evidence with a view to initiating prosecution actions (e.g. issuing fixed penalty notices or summonses). Section 26 of the Magistrates Ordinance (Cap. 227) stipulates that a summons must be issued within six months of the time when an offence is committed. In 2007, the MD issued 78 fixed penalty notices and 1,724 summonses. The total fines amounted to \$1.84 million.

Audit observations and recommendations

3.23 Audit noted that from 2004 to 2007, a total of 169 prosecution cases were revoked, as shown in Table 4.

Table 4**Number of revoked prosecution cases
(2004 to 2007)**

Year	Number of cases
2004	39
2005	55
2006	55
2007	20
Total	169

Source: MD records

3.24 From the 169 revoked cases, Audit selected a sample of 50 cases for examination. Based on an analysis of the reasons for revoking the cases as recorded in the case files concerned, Audit found that there was room for improvement in the handling of 27 (54%) of the 50 prosecution cases. Table 5 summarises the reasons for revocation of the 27 cases. Examples of such revoked cases are given at Appendix D.

Table 5**Reasons for revocation of the 27 cases**

Reasons for revocation	Number of cases
(a) Failure to obtain necessary evidence	23
(b) Failure to issue summonses within the statutory time limit (see para. 3.22)	3
(c) Loss of case file and enclosed evidence	1
Total	27

Source: MD records

3.25 Audit considers that the revocation of some of these cases might have been avoided if better training had been provided to the patrol officers concerned, and the handling of the cases had been more closely supervised. In particular, Audit is concerned that administrative oversight might have been involved in a number of these revoked cases.

Audit recommendations

3.26 **Audit has recommended that the Director of Marine should:**

- (a) **analyse the reasons for revoking prosecution cases, and take necessary follow-up action on those cases which involve administrative oversight; and**
- (b) **take measures to improve the handling of prosecution cases, such as by enhancing training and supervision of patrol officers.**

Response from the Administration

3.27 The **Director of Marine** agrees with the audit recommendations. He has said that:

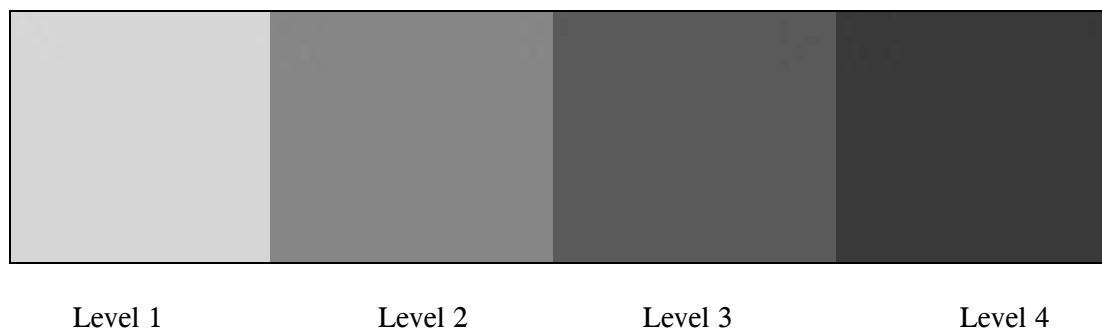
- (a) the HPS guidelines and procedures for processing prosecutions will be reviewed;
- (b) the approval authorities for withdrawal of prosecution cases will be clearly specified; and
- (c) necessary training and supervision will be provided.

Actions against excessive smoke emission

3.28 According to MD guidelines, a vessel is considered to be emitting excessive smoke if its smoke emission exceeds Level 2 in the Ringelmann Chart (see Figure 2) continuously for three minutes or more.

Figure 2

Ringelmann Chart



Source: MD records

Remarks: A Ringelmann Chart is a series of shaded illustrations used to measure the opacity of air pollution emissions.

Audit observations and recommendation

3.29 Audit examination of the MD's enforcement records in 2006 and 2007 revealed that in five cases, the smoke emitted by the vessels was excessive. However, prosecution actions were only taken in three cases. In the other two cases, warning letters were sent and no further action was taken (see Table 6). However, no justification was documented on file for not taking prosecution action.

Table 6
Cases of emission of excessive smoke
(2006 and 2007)

Case	Level and duration of smoke emission		Action taken
	Ringelmann Level	Duration	
A	4	Over 10 minutes	Prosecution
B	3	Over 10 minutes	Prosecution
C	3	20 minutes	Prosecution
D	3	7 minutes	Warning letter
E	3	3 minutes	Warning letter

Source: MD records

Audit recommendation

3.30 **Audit has recommended** that the Director of Marine should ensure that, in cases where the vessels are found to be emitting excessive smoke, the justifications for not taking prosecution action are documented for approval by the appropriate authority.

Response from the Administration

3.31 The **Director of Marine** agrees with the audit recommendation and has said that appropriate improvement measures will be taken (see also para. 3.27).

PART 4: MAINTENANCE OF AIDS TO NAVIGATION

4.1 This PART examines the maintenance of aids to navigation by the MD and identifies areas where improvements could be made.

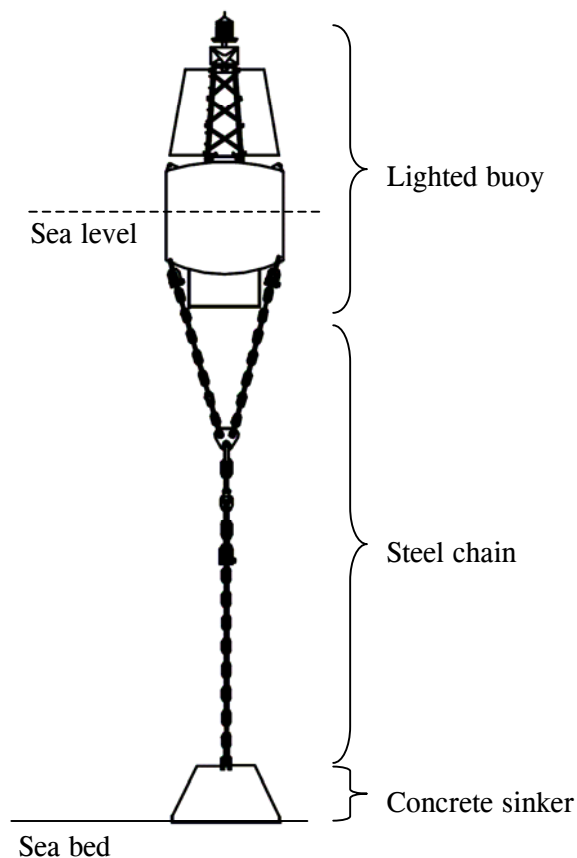
Aids to navigation

4.2 Aids to navigation act as a guide for vessels and assist their safe movement. They are placed to mark:

- (a) structures such as piers and breakwaters;
- (b) boundaries and turns; and
- (c) hidden dangers such as rock outcrops.

4.3 There are two main groups of aids to navigation, i.e. lighted buoys and beacons. Lighted buoys float on water and are chained to a concrete sinker (Photograph 1 in PART 1 and Figure 3 below). Beacons, such as lighthouses and pier lights, are tall structures each topped by a light (Photograph 2 in PART 1). As at 31 December 2007, 533 aids to navigation were placed in different parts of Hong Kong waters.

Figure 3

The components of a lighted buoy

Source: MD records

4.4 The Aids to Navigation and Mooring Unit (ANMU) of the MD is responsible for the provision and maintenance of aids to navigation. As at 31 December 2007, the ANMU had a staff establishment of 27.

Maintenance of aids to navigation

4.5 To ensure the proper functioning of aids to navigation, the ANMU regularly carries out on-site visits to inspect and maintain aids to navigation. In addition, annual overhauling work is carried out for lighted buoys.

4.6 In December each year, the ANMU prepares for the coming year's on-site inspection and maintenance schedules. These schedules set out the frequency of on-site inspections and the tentative dates for the visits. A service report, listing out the inspection and maintenance work carried out, is required to be completed after each on-site inspection visit.

Audit observations and recommendations

Compliance with inspection schedules

4.7 Audit noted that the frequency of scheduled on-site inspections of aids to navigation in 2007 ranged from once a month to at least once half-yearly. **However, Audit found that the frequency of on-site inspections of 179 (34% of 533) aids to navigation in 2007 was less than that scheduled.** For example, no on-site inspection was carried out for 58 lighted buoys in 2007, despite the fact that they were scheduled to be inspected at least twice a year.

Availability of aids to navigation

4.8 According to the manual issued by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA — Note 3), the availability of an aid to navigation is defined as the percentage of the amount of time it is functioning. Availability should be calculated over a three-year period. Member authorities should set 95% as the absolute minimum level of availability for each and every aid to navigation they provide. Aids to navigation with an availability below 97% should be considered substandard, and no aid should have an availability below 95%. If the authority concerned cannot maintain the availability of the aids it provides above 95%, it should consider discontinuing the aids concerned and concentrating its resources on the remaining aids to ensure that they are operating satisfactorily.

4.9 An audit examination of the 2007 maintenance records of the MD's aids to navigation revealed that the availability of seven aids was below 97%. Four of these seven aids had an availability below 95%. The audit findings are summarised in Table 7.

Note 3: *IALA is a non-governmental organisation established in 1957. It brings together more than 80 member authorities (including Hong Kong) for technical co-ordination, information sharing, and co-ordination of improvements to aids to navigation throughout the world.*

Table 7
Availability of aids to navigation provided by the MD
(2007)

Availability	Number of aids
100%	514
$\geq 97\%$ and $< 100\%$	12
$\geq 95\%$ and $< 97\%$	3
$< 95\%$	4
Total	533

Source: Audit analysis of MD records

4.10 Upon Audit's enquiry, the MD explained that the seven aids to navigation, which had an availability below 97%, were for marking major waterways, and it would be difficult to justify discontinuing these aids. Audit considers that the MD should closely monitor these aids, and take actions (e.g. by carrying out inspection and maintenance work more frequently) to improve their availability.

Recording of breakdowns of aids to navigation

4.11 Audit notes that the ANMU uses a fault report to record the following information about breakdowns of aids to navigation:

- (a) the reporting time of the breakdowns;
- (b) the faults identified;
- (c) the repair work carried out; and
- (d) the time of resumption of operation.

The information recorded enables the MD to ascertain, among other things, the availability of the aids to navigation being provided.

4.12 An audit examination of ANMU records of the 100 cases of aid to navigation breakdowns in 2006 and 2007 revealed that, in 48 (48%) cases, a fault report was not prepared. As such, the breakdown records were not readily available as they were scattered in various reports and files. Some of the essential information mentioned in paragraph 4.11 in respect of these 48 breakdown cases could not be found (see Table 8).

Table 8
Information missing in the
48 breakdown cases without a fault report

Information missing	Number of cases
Reporting time of breakdown	7 (15%)
Fault identified	10 (21%)
Repair work carried out	6 (13%)
Time of resuming operation	48 (100%)

Source: MD records

4.13 Regarding the 52 cases where a fault report was prepared, Audit noted that in 10 cases, the relevant fault reports did not record the time of resumption of operation which was needed for assessing the availability of the aids to navigation.

Audit recommendations

4.14 **Audit has recommended that the Director of Marine should:**

- (a) **ensure that on-site inspections of aids to navigation for maintenance are carried out in accordance with laid-down schedules. Where there is a need to make changes to the schedules, the justifications and approval given should be properly documented;**
- (b) **closely monitor the availability of all the aids to navigation and take actions (e.g. by carrying out inspection and maintenance work more frequently) to ensure that their availability is maintained at 97% or above; and**
- (c) **take measures to improve the completeness and accuracy of the recording and reporting of breakdowns of aids to navigation (e.g. establishing a**

computerised recording system to capture all relevant breakdown information).

Response from the Administration

4.15 The **Director of Marine** agrees with the audit recommendations. He has said that:

- (a) changes of on-site inspection schedules will be recorded in inspection reports together with the reasons and re-inspecting schedules. The reports will be submitted to the ANMU's management for approval;
- (b) the down time of the seven aids mentioned in paragraph 4.9 was caused by ship strikes and vandalism. The availability of these aids will be closely monitored;
- (c) the ANMU will also liaise with the HPS and the Marine Police to step up the patrol for reducing the chance of ship strikes and vandalism;
- (d) to reduce down time, temporary lights will be installed on the damaged aids whenever possible before replacement work can be carried out;
- (e) the MD will establish procedures for the supervision and keeping of fault reports; and
- (f) the ANMU will develop a computer database to capture the down time information of aids to navigation.

Spare parts for aids to navigation

4.16 The ANMU maintains a store for spare parts for aids to navigation. In 2006-07, the value of spare parts purchased and issued amounted to \$4 million and \$2.6 million respectively. As at 31 December 2007, 149 spare parts with a total value of about \$7 million were in store.

Audit observations and recommendations

Low stock turnover rate

4.17 One measure to assess the appropriateness of the stock level is the stock turnover rate (Note 4). Audit notes that the Government Logistics Department (GLD) sets a stock turnover rate target of 0.5 for the essential and emergency store items it maintains.

4.18 As shown in Table 9, the stock turnover rate of the spare parts maintained by the ANMU for the period 2005-06 to 2007-08 (up to December 2007) was 0.36, which was significantly lower than the 0.5 target set by the GLD. In Audit's view, the MD needs to consider, in the light of the utilisation of the aids to navigation spare parts and its operational requirements, reducing the level of stock holding by reference to the target stock turnover rate set by the GLD.

Table 9
Stock turnover rate of
spare parts for aids to navigation

Year	Value of stock issued (A) (\$ million)	Average value of stockholding (Note) (B) (\$ million)	Stock turnover rate (C) = (A) ÷ (B) (Times)
2005-06	2.5	7.0	0.36
2006-07	2.6	7.2	0.36
2007-08 (Up to December)	2.3	6.3	0.37

Source: Audit analysis of MD records

Note: The average value of stockholding is calculated by taking the mean of the sums of the value of stockholding at the end of each month of the year.

Note 4: The stock turnover rate is calculated by dividing the total value of stock issued in a year by the average value of stockholding for the year.

Dormant spare parts

4.19 Audit noted that as at 31 December 2007, 68 spare parts, which cost about \$1.7 million, had been kept in store for three or more years. Audit found that additional items were purchased in 2006-07 and 2007-08 (up to December 2007) for five of these spare parts (see Table 10). However, the justifications for these purchases were not documented on file.

Table 10

**Details of new stock purchased for
dormant spare parts during 2006-07 and 2007-08**

Spare parts	Date of last issue from stock	Stock in hand (31/3/2006)	New purchases		Stock in hand (31/12/2007)	
		Quantity	Date	Quantity	Quantity	Value (\$)
Mother board for flasher and controller unit	31/5/2000	1	20/9/2006	4	5	29,585
Timer circuit for flasher	6/11/2000	1	20/9/2006	4	5	22,126
Lens for lantern	6/11/2000	12	5/9/2007	2	14	27,263
Flash circuit for lantern	25/6/2002	2	20/9/2006	4	6	32,483
Control circuit for lantern	25/6/2002	1	20/9/2006	4	5	15,461

Source: MD records

Audit recommendations

4.20 **Audit has recommended that the Director of Marine should:**

- (a) **closely monitor the level of spare parts for aids to navigation, especially those spare parts which are slow-moving, to ensure that they are kept at the appropriate level; and**

- (b) ensure that the justifications for purchasing spare parts, which have been identified as dormant, are documented for approval by the appropriate authority.

Response from the Administration

4.21 The **Director of Marine** agrees with the audit recommendations. He has said that:

- (a) spare parts will be closely monitored to ensure that they are kept at an appropriate level;
- (b) purchasing of dormant spare parts will be documented with justifications for the approving officer's consideration;
- (c) some spare parts for major aids to navigation (e.g. lanterns of Waglan lighthouse, Ma Wan lights and Tathong lighthouse) are not readily available in the market. They normally take one year to order and deliver, and therefore are required to be purchased well in advance to allow for procurement lead time; and
- (d) the ANMU needs to keep sufficient stock in hand to ensure the availability of those major aids mentioned in (c) above. As a result, the stock turnover rate is lower than the target set by the GLD.

PART 5: PROVISION OF MOORING FACILITIES

5.1 This PART examines, and suggests improvement on, the provision of mooring facilities by the MD.

Buoys and anchorage areas

5.2 As at 31 December 2007, the MD operated and maintained 31 buoys (Photograph 4 in PART 1) and 24 anchorage areas (Photograph 5 in PART 1) to meet the mooring needs of port users. The majority of mooring buoys are at Kellet Bank (Note 5) of Victoria Harbour. A summary of buoys in operation is shown in Table 11.

Table 11

**MD mooring buoys in operation
(31 December 2007)**

Class (Note 1)	Typhoon buoys (Note 2)	Non-typhoon buoys	Total
Class A	15	6	21
Class B	6	4	10
Total	21	10	31

Source: MD records

Note 1: Class A buoys are for use by vessels up to 183 metres in length and Class B buoys are for use by vessels up to 137 metres.

Note 2: Typhoon buoys are special buoys to which vessels could remain secured during tropical cyclones.

Note 5: *Kellet Bank is the waters between Kennedy Town and Ngong Shuen Chau.*

5.3 Buoy dues are allocated to vessels twice a day (at 10 a.m. and 5 p.m.). Buoy dues are charged once a buoy is reserved by a vessel. A full day's rate will be charged even if a buoy is only occupied or reserved for part of a day. Buoys can be reserved for use by a vessel up to 48 hours before its arrival in Hong Kong. As at 31 December 2007, the rates of Class A and Class B buoy dues were \$3,685 per day and \$2,455 per day respectively.

5.4 Of the 24 anchorage areas, 3 were Immigration and Quarantine Anchorages designated for visiting vessels to complete port formalities, 8 were designated for handling dangerous goods, and the remaining 13 were general-purpose anchorages providing temporary berthing space for vessels.

5.5 Anchorages are allocated on a first-come-first-served basis, and no advance booking is allowed. Vessels at anchorage are charged on a "per 100 tons per hour" basis. The current rates are \$2 per 100 tons per hour if the vessel is anchoring within the limits of Victoria Harbour, and \$1.5 per 100 tons per hour if it is anchoring elsewhere in Hong Kong waters. The first 12 hours at anchorage are free of charge.

5.6 In general, it would be less costly for small and medium sized vessels to stay at anchorages instead of mooring at buoys. For example, if a medium sized vessel of 7,000 tons is staying in Hong Kong for 30 hours, it would incur at least \$7,370 if it moors at a buoy, but only \$2,520 (Note 6) if it stays at anchorage. Table 12 summarises the financial results of the provision of mooring buoys and anchorages for the period 2002-03 to 2006-07.

Note 6: *The costs are calculated as follows:*

(a) *for mooring at a buoy:* \$3,685 per day \times 2 days = \$7,370

(b) *for staying at anchorage (within the limits of Victoria Harbour):*
\$2 per hour \times 70 \times (30 - 12) hours = \$2,520

Table 12

**Financial results of the provision of mooring facilities
(2002-03 to 2006-07)**

Year	Dues		Operating cost (Note)		Operation surplus/(deficit)	
	Buoy	Anchorage	Buoy	Anchorage	Buoy	Anchorage
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
2002-03	17,015	31,353	30,031	38,317	(13,016)	(6,964)
2003-04	14,530	37,519	29,773	37,321	(15,243)	198
2004-05	12,159	29,313	25,695	30,746	(13,536)	(1,433)
2005-06	13,066	29,394	21,837	26,553	(8,771)	2,841
2006-07	12,825	15,381	21,088	26,076	(8,263)	(10,695)

Source: MD records

Note: This was calculated by the MD using global costing method which involved enumerating the overall costs incurred by the MD in the provision of all services and allocating the costs to each of the services on a pro rata basis.

Reviews carried out by the Marine Department

5.7 In April and June 2001, the MD completed two reviews on the demand for and utilisation of buoys and anchorages. The reviews found that:

- (a) the overall utilisation of buoys decreased drastically from 43% in 1997 to 28% in 2000;
- (b) there was a notable shift of cargo operation from buoys to anchorages;

- (c) compared to mooring at buoys, the cost incurred by vessels using anchorages was generally lower; and
- (d) deep-water anchorages and anchorages in less exposed areas were more popular than shallow-water anchorages and those in more exposed areas.

5.8 The reviews recommended a number of measures to improve the provision and utilisation of mooring facilities, including:

- (a) withdrawing surplus buoys and converting the area concerned into an anchorage area;
- (b) revising the charge of buoy dues from a daily basis to an hourly basis; and
- (c) taking into consideration water depth and location (e.g. whether the area was exposed) in planning the provision of anchorages.

Audit observations and recommendations

Utilisation of buoys

5.9 Between October 2003 and March 2004, the MD removed 24 buoys from operation as a result of the recommendation of the internal reviews conducted in 2001. As at 31 March 2004, the number of buoys was 29.

5.10 In July 2005, the MD laid two new Class A buoys in the waters off North Lantau, thereby increasing the total number of buoys to 31. However, Audit found that the utilisation (Note 7) of Class A and Class B buoys in 2007 remained low at 29% and 24% respectively. In particular, 7 Class A buoys and 3 Class B buoys had an utilisation rate of 10% or less (see Table 13).

Note 7: *A mooring buoy is deemed to be utilised once it is reserved for use by a vessel, because buoy dues are charged once the buoy is reserved (see para. 5.3).*

Table 13
Utilisation of mooring buoys
(2007)

Utilisation rate	Number of buoys	
	Class A	Class B
0 — 5%	4 } 3 } 7	2 } 1 } 3
6 — 10%		
11 — 20%	5	2
21 — 40%	4	4
41% or more	5 (Note)	1 (Note)
Total	21	10

Source: Audit analysis of MD records

Note: These buoys were occupied by passenger ferries offering overnight leisure trips.

5.11 Audit noted that, during the period 2002-03 to 2006-07, the low utilisation of buoys resulted in a deficit in operation (declining from \$15.2 million in 2003-04 to \$8.2 million in 2006-07 — see Table 12 in para. 5.6). **Audit considers that the MD needs to re-examine whether the operation of those buoys with low utilisation should continue.**

Actions taken to revise buoy dues

5.12 In March 2001, the MD consulted shipping companies and related trade associations on its proposals to optimise the utilisation of buoys and anchorages by:

- (a) converting surplus buoys into anchorages; and
- (b) bringing in new fee structures for buoy dues.

5.13 In May 2001, after consulting shipping companies and related trade associations, the MD sought policy support from the then Economic Services Bureau for revising the charging basis for buoy dues from a daily basis to an hourly basis.

5.14 In May 2003, the then Economic Development and Labour Bureau (EDLB) advised the MD that in view of the economic climate, the timing for introducing changes to government fees was not appropriate. Moreover, as the last consultation was carried out in 2001, the EDLB considered that fresh consultation was needed. However, as at December 2007, no fresh consultation was carried out and the charging basis for buoy dues remained unchanged.

Monthly buoy utilisation reports

5.15 The MD's computerised management information system (MIS) generates monthly buoy utilisation reports. However, in computing the utilisation rates of the mooring buoys, the MIS excluded those buoys with no bookings. As such, the utilisation rates so calculated by the MIS were overstated.

Audit recommendations

5.16 **Audit has recommended that the Director of Marine should:**

- (a) **closely monitor the buoy utilisation rate and re-examine whether the operation of those buoys with low utilisation should continue;**
- (b) **consider taking measures to encourage buoy utilisation. These may include reviewing the charging basis for buoy dues in consultation with key stakeholders (e.g. shipping companies and related trade associations); and**
- (c) **consider revising the basis for computing the utilisation rates of mooring buoys.**

Response from the Administration

5.17 The **Director of Marine** agrees with the audit recommendations. He has said that the MD will:

- (a) review whether the operation of those buoys with low utilisation should continue;
- (b) consult the industry on the charging basis for buoy dues; and
- (c) review the basis for computing the utilisation rates for mooring buoys. Buoys which are not used will be included in calculating the buoy utilisation.

PART 6: INSPECTION OF VESSELS VISITING HONG KONG

6.1 This PART examines, and suggests improvement on, the Port State Control (PSC) inspection of OGVs and RTVs visiting Hong Kong.

Inspection of ocean going vessels

Tokyo Memorandum of Understanding

6.2 Vessel owners and flag states (Note 8) have the primary responsibility to ensure their vessels are kept at the required maritime standards through periodic surveys and certification (by relevant authorities or recognised bodies). As many vessels do not regularly call at their flag states, the port states (Note 9) have the responsibility for carrying out PSC inspections (Note 10) on visiting vessels.

6.3 A vessel going to a port in one country will normally visit other countries in the region before embarking on its return voyage. To ensure that as many vessels as possible are inspected and to prevent vessels from being delayed by unnecessary inspections, it is important that PSC inspections are closely coordinated. In this regard, the International Maritime Organisation of the United Nations has encouraged the establishment of regional organisations and agreements on PSC.

6.4 The conducting of PSC inspections in the Asia-Pacific region is regulated by the Memorandum of Understanding on Port State Control in the Asia-Pacific Region (also known as the Tokyo MOU) concluded at Tokyo in 1993 by maritime authorities in the region. Currently, the Tokyo MOU has 18 full members (Note 11).

Note 8: *A flag state is the country where a vessel is registered.*

Note 9: *A port state is the country where the port of call is located.*

Note 10: *A PSC inspection consists of checks on the certificates and documents of a vessel to ensure that the staff and the overall condition of the vessel, its equipment, machinery spaces and accommodation, and hygienic conditions on board, meet the local and international maritime standards.*

Note 11: *These 18 full members are Australia, Canada, Chile, China, Fiji, Hong Kong, Indonesia, Japan, Republic of Korea, Malaysia, New Zealand, Papua New Guinea, Philippines, Russian Federation, Singapore, Thailand, Vanuatu and Vietnam.*

6.5 The PSC Section of the MD is responsible for conducting PSC inspections on OGVs visiting Hong Kong (Note 12). Any vessels found with major deficiencies during the PSC inspections will be detained until rectification works have been carried out to the satisfaction of the MD during re-inspections.

Analysis of the risk of OGVs

6.6 The Tokyo MOU Secretariat maintains a computer system, namely the Asia-Pacific Computerised Information System (APCIS), to collect PSC inspection data from member authorities. The APCIS records the PSC inspections conducted by member authorities, and facilitates member authorities in the selection of OGVs for PSC inspections by:

- (a) analysing the risk of each OGV based on the following factors:
 - (i) age, type and flag of the OGV concerned;
 - (ii) the classification society (Note 13) to which the OGV belongs;
 - (iii) the inspection history of the OGV (e.g. deficiencies found and detention in the last four PSC inspections);
 - (iv) number of outstanding deficiencies; and
 - (v) time since last initial inspection; and
- (b) assigning a targeting factor value to each OGV after the analysis (see Appendix E). OGVs with high targeting factor values are considered less safe and should be accorded a higher priority to be selected for PSC inspection.

Note 12: *The MD's authority to carry out inspections on vessels visiting Hong Kong is provided by the Merchant Shipping (Safety) Ordinance (Cap. 369), the Merchant Shipping (Prevention and Control of Pollution) Ordinance (Cap. 413) and the Merchant Shipping (Security of Ships and Port Facilities) Ordinance (Cap. 582). As at December 2007, the PSC Section was headed by a senior surveyor and had six surveyors for carrying out PSC inspections.*

Note 13: *In the shipping industry, classification societies are non-governmental organisations that promote the safety of vessels. Classification societies set technical rules, confirm that designs and calculations meet these rules, survey vessels during the process of construction and commissioning, and periodically survey vessels to ensure that they continue to meet the rules. All nations require that vessels flying their flags meet certain standards. In most cases, these standards are deemed to be met if the vessels have obtained the relevant certificates from a recognised classification society.*

PSC inspection target

6.7 Since 2000, the MD has stated in its Controlling Officer's Report (COR) that its annual target is to carry out PSC inspections on 15% of the OGVs visiting Hong Kong.

Audit observations and recommendations*PSC inspection target not always met*

6.8 Audit noted that the PSC Section was not always able to meet the target of inspecting 15% of the OGVs visiting Hong Kong (see Table 14).

Table 14
Target and actual percentage of OGVs inspected
(2000 to 2007)

Year	Percentage of OGVs inspected	
	Target (%)	Actual (%)
2000	15	15
2001	15	15.8
2002	15	16.9
2003	15	20.4
2004	15	16.9
2005	15	11.2
2006	15	13.1
2007	15	15

Source: MD records

Selection of OGVs for PSC inspection

6.9 The Tokyo MOU requires member authorities to adopt a risk-based approach to select OGVs for PSC inspections. The member authorities should determine the order of priority based on a risk analysis (see para. 6.6). Such a requirement has been adopted by the MD. According to the MD's "Procedures and Selection Criteria in Selecting Ships for

PSC Inspection”, in selecting ships for inspection, a higher priority should be given to the vessels with higher targeting factor values and also those with no APCIS record.

6.10 An audit examination of the records of the PSC inspections carried out in July and August 2007 showed that of the 64 OGVs with targeting factor values more than 100 or with no APCIS record, 37 (58%) were not inspected (see Table 15).

Table 15
OGVs inspected by the PSC Section in July and August 2007

APCIS targeting factor value	Number of OGVs (Note)		
	Visiting Hong Kong	Inspected	Not inspected
0 – 10	133	18	115
11 – 20	187	25	162
21 – 30	74	12	62
31 – 40	32	11	21
41 – 50	13	6	7
51 – 60	27	11	16
61 – 70	8	6	2
71 – 80	6	2	4
81 – 90	5	2	3
91 – 100	1	1	0
Over 100	3	1	2
No APCIS record	61	26	35
Total	550	121	429

Source: Audit analysis of MD records

Note: Figures in the Table do not include OGVs which have been inspected by other members of the Tokyo MOU within six months. As stated in the inspection manual issued by the Tokyo MOU, OGVs which have been inspected within six months should not be subject to another PSC inspection.

6.11 In response to Audit's enquiry, the PSC Section advised that not all OGVs with high targeting factor values could be selected for inspection for the following reasons:

- (a) ***Departure of vessels in the early morning.*** On a typical day, the PSC Section would select vessels, based on their berthing/anchorage records, for PSC inspections at around 8:30 a.m. Surveyors would leave their base to commence PSC inspections at around 9:00 a.m. and return to their base at around 2:30 p.m. If a vessel was expected to leave in the early morning, the surveyors might not be able to complete their inspection in time;
- (b) ***Vessels not in the vicinity of those selected for inspection.*** To reduce travelling time, the OGVs selected for inspection were in close vicinity of one another;
- (c) ***New ships just launched often without APCIS record.*** The risk level of such new ships was considered low as they were generally in good condition. Therefore, they were not normally selected for inspection; and
- (d) ***Other factors.*** Apart from the target factor values and APCIS record, there were other factors that might be adopted for the selection of ships. For example, under the Tokyo MOU's directive of carrying out concentrate inspection campaign on specific area or type of ships for a certain period, ships with lower target factor values would also need to be selected for inspection.

6.12 Audit notes that OGVs have to inform the MD their estimated arrival time and expected berthing or anchorage locations 24 hours before entering Hong Kong waters. They would stay, on average, in Hong Kong for about 25 hours. With proper forward planning, the MD should have sufficient time for carrying out a PSC inspection for an OGV, which normally takes about three hours to complete. Audit appreciates that, for operational reasons, not all OGVs with high targeting factor values or with no APCIS record could be selected for PSC inspections. However, the MD should take measures to ensure that more of these vessels are inspected.

Inspections not carried out for OGVs selected

6.13 According to the operation guidelines of the PSC Section, the officer-in-charge of the PSC Section is required to record the justifications for any case where a selected OGV is not inspected, or the OGV inspected is unplanned. An audit test check of the PSC inspection records in August 2007 revealed the following:

- (a) in six cases, other OGVs were inspected instead of the originally selected ones. However, in two of these six cases, Audit noted that there were no records indicating:

- (i) the criteria used by the surveyors in selecting the substitute OGVs for inspection; and
 - (ii) approval from the supervisory officer for selecting the substitute OGVs; and
- (b) in one case, the justifications for not carrying out an inspection on the selected vessel were not recorded.

Audit recommendations

6.14 **Audit has recommended that the Director of Marine should:**

- (a) **closely monitor PSC inspections carried out on OGVs visiting Hong Kong, and take measures to ensure that the annual inspection target is met;**
- (b) **improve the scheduling of PSC inspections to ensure that OGVs with high targeting factor values or those old OGVs with no APCIS record are selected for PSC inspection as far as practicable; and**
- (c) **ensure that the justifications for not carrying out planned PSC inspections on OGVs, including the selection of substitute OGVs, are documented and approved by the appropriate authority.**

Response from the Administration

6.15 The **Director of Marine** agrees with the audit recommendations. He has said that:

- (a) the inspection target was not met in 2005 and 2006 because two surveyors in the PSC Section were temporarily deployed to meet the workload arising from the increasing number of ships in the Hong Kong Shipping Register and those applying for registration;
- (b) the staff situation was improved and the PSC Section resumed full strength in mid-2007. Therefore, it was able to achieve the target of 15% in 2007;
- (c) the MD has established monthly inspection targets such that any discrepancy could be identified at an early stage, and remedial measures would be taken to alleviate the situation;

- (d) the inspection rate and ship selection system for the region would be discussed at the Tokyo MOU Port State Control Committee meeting in August 2008. As a member of the Tokyo MOU, Hong Kong will follow the decision of the Tokyo MOU and may need to adjust its ship selection criteria in future; and
- (e) the PSC Section will establish procedures to the effect that:
 - (i) the PSC Section Head will, as a daily routine, select additional OGVs to serve as substitutes to those planned ones; and
 - (ii) in case a planned PSC inspection cannot be conducted, the concerned PSC officer is required to report to the Section Head immediately, and proceed to inspect the next selected substitute OGV. The Section Head is required to document the change in plan and its justification.

Inspection of river trade vessels

6.16 The inspection work for RTVs was similar to that for OGVs (see Note 10 in para. 6.2). There are two main types of RTVs, i.e. high-speed passenger vessels and river trade cargo vessels. Following a marine incident in February 2005 in which a high-speed passenger vessel and a river trade cargo vessel collided, injuring more than 100 passengers, the MD informed the Legislative Council that Mainland registered high-speed passenger vessels would be inspected once every two years. In 2006, the MD further revised the inspection target to once a year.

Audit observations and recommendation

6.17 Audit noted that in 2006 and 2007, the MD inspected all the 40 Mainland registered high-speed passenger vessels once as required. The number of river trade cargo vessels inspected were 38 in 2006 and 20 in 2007. The inspection results are shown in Table 16.

Table 16
Statistics of inspections carried out on RTVs
(2006 and 2007)

	High-speed passenger vessel		River trade cargo vessel	
	2006	2007	2006	2007
Number of vessels visiting Hong Kong (Note)	40	40	2,610	2,580
Number of inspections carried out	40	40	38	20
Inspection rate	100%	100%	1.46%	0.78%
Number of vessels with deficiencies found	40 (100%)	38 (95%)	38 (100%)	20 (100%)
Number of vessels detained because of major deficiencies found	0	0	23 (61%)	11 (55%)

Source: Audit analysis of MD records

Note: Locally licensed RTVs are not subject to PSC inspection. Hence, they are not included in the analysis.

6.18 The HPS is responsible for selecting river trade cargo vessels for inspection, and the PSC Section is responsible for carrying out the inspection. Audit noted that of the 58 (38 in 2006 and 20 in 2007) river trade cargo vessels inspected in 2006 and 2007, eight (14%) were selected in response to complaints received. The remaining 50 (86%) selected were all berthed in the vicinity of the HPS Operations Centre near the Yau Ma Tei Typhoon Shelter.

6.19 The MD had not laid down any written guidelines on the selection of river trade cargo vessels for inspection. According to the officer-in-charge of the HPS, patrol officers select river trade cargo vessels for inspection mainly based on the appearance and external conditions of the vessels, and the ease of access to the vessels. Audit considers that the MD needs to establish guidelines setting out the criteria for selecting vessels for inspection.

Audit recommendation

6.20 **Audit has recommended that the Director of Marine should consider establishing guidelines on the selection of river trade cargo vessels for inspection.**

Response from the Administration

6.21 The **Director of Marine** agrees with the audit recommendation. He has said that:

- (a) the PSC Section will coordinate with the HPS to draw up a set of comprehensive guidelines on the selection of river trade cargo vessels for inspection; and
- (b) among all public cargo working areas in Hong Kong, the one within the Yau Ma Tei Typhoon Shelter handled the highest number of containers and breakbulk cargo. In line with the reasons set out in paragraph 6.11, the HPS concentrated its inspection of RTVs at that most popular vessel berthing area in Yau Ma Tei (see para. 6.18).

PART 7: PERFORMANCE MEASUREMENT AND REPORTING

7.1 This PART examines, and suggests improvement on, the performance measurement and reporting of the MD on port services to provide better accountability.

Performance measures

7.2 Performance management ensures that the Government's aims, objectives and priorities are put into effect. Performance measures (i.e. targets and indicators) exist at various levels in the Government's management process. At departmental level, departments have to analyse their activities in terms of one or more programmes in their CORs. Against each programme in the CORs, departments have to set out the programme aims and the performance measures.

7.3 The MD has established and reported the following performance measures for port services in its COR:

- (a) performance targets:
 - (i) maintaining the availability of aids to navigation at 99%; and
 - (ii) carrying out PSC inspections on 15% of the OGVs visiting Hong Kong; and
- (b) performance indicators:
 - (i) the number of OGV arrivals;
 - (ii) the number of container throughput by OGVs; and
 - (iii) the number of aids to navigation maintained.

Audit observations and recommendation

7.4 Audit reviewed the performance measures adopted by the MD, overseas port authorities, other government departments and also those recommended by international bodies. Audit found that there was room for improvement in the MD's performance measurement and reporting.

Regulation of vessel movement

7.5 According to the vessel traffic services manual issued by IALA in 2002, port authorities should consider establishing performance measurement to determine the extent to which the aims and objectives of their vessel traffic services have been met. Audit noted that as at 31 December 2007, the MD used the level of accidents as a clear measure of performance to determine the extent to which the aims and objectives of the vessel traffic services have been met. In this connection, Audit found that some overseas port authorities had set and published performance targets to monitor and report their performance in regulating vessel movements (see Appendix F). In Audit's view, the MD needs to consider setting and publishing performance measures to monitor and report its performance in the regulation of vessel movements.

Management of harbour patrol operation

7.6 The MD regularly conducts patrols within Hong Kong waters and carries out special operations against specific marine offences (see PART 3). However, as at March 2008, the MD had not established any performance measures for monitoring and reporting its performance in its harbour patrol operation. Audit notes that government departments that regularly carry out special enforcement operations usually set the number of special operations carried out as their performance targets. For example, the Immigration Taskforce of the Immigration Department regularly carries out special operations against illegal workers, and has set the number of operations carried out as a performance indicator in its COR. Audit considers it useful for the MD to set and publish performance measures for its harbour patrol operation.

Provision and maintenance of aids to navigation

7.7 According to the manual issued by the IALA (see para. 4.8), port authorities should establish performance measures to monitor and report the availability, reliability (i.e. the average time between failures) and continuity (i.e. the probability that an aid is functioning without interruption during a specific time) of the aids to navigation they provide. Audit notes that the MD has established a performance target to monitor the availability of aids to navigation. There is, however, no performance target for monitoring and reporting the reliability and continuity of aids to navigation.

Audit recommendation

7.8 **Audit has recommended that the Director of Marine should consider establishing additional performance measures for the provision of port services by the MD, including performance measures for:**

- (a) **the regulation of vessel movement;**
- (b) **the management of harbour patrol operation; and**
- (c) **monitoring the reliability and continuity of aids to navigation.**

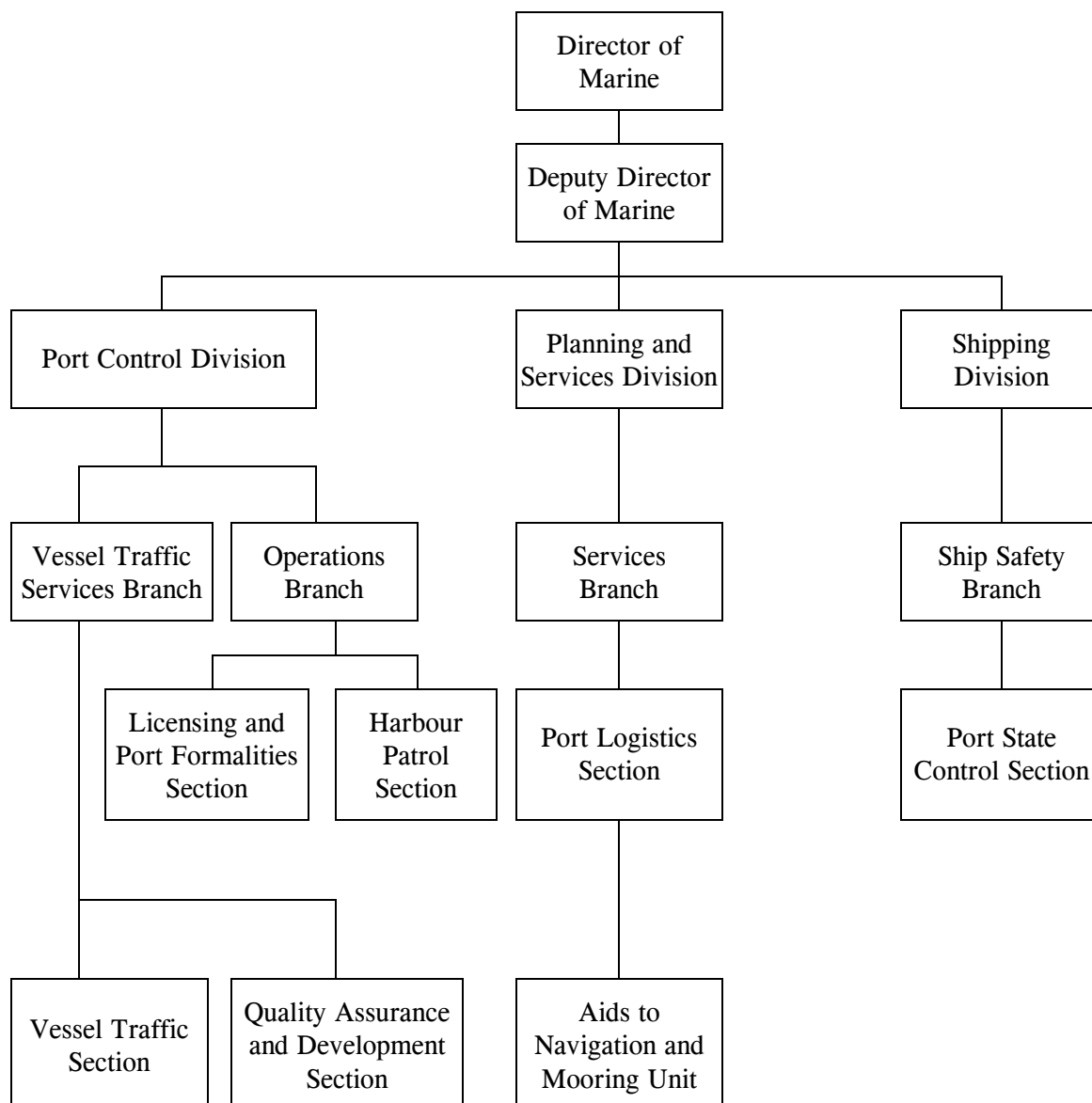
Response from the Administration

7.9 The **Director of Marine** agrees with the audit recommendation. He has said that:

- (a) the MD will initiate appropriate and practicable performance measures for the regulation of vessel movement, the management of harbour patrol operation, and the reliability and continuity of navigation aids;
- (b) two indicators (i.e. “Collisions, strandings and strikings affecting OGVs in Hong Kong Waters” and “Collisions, strandings and strikings affecting locally licensed, river trade and coastal vessels in Hong Kong Waters”) are shown in the COR. They also serve as performance measures to determine the extent to which the aims and objectives of the Vessel Traffic Services have been met;
- (c) the MD will address those indicators set out by other port authorities that are relevant to its operation; and
- (d) the performance targets for the reliability and continuity of aids to navigation have been provided by the manufacturers and relevant information is available in the ANMU’s monitoring system. The MD will consider how the information can be presented as performance targets.

7.10 The **Secretary for Financial Services and the Treasury** welcomes the audit recommendation that the MD should consider establishing additional performance measures for the provision of port services.

Marine Department organisation chart (extract)
(31 December 2007)



Source: MD records

**Examples to illustrate deficiencies which occurred a number of times
(2004 to 2007)**

(a) Failure to give timely advice to vessels

- (1) On 28 October 2005, an OGV with a pilot on board collided with a local tug towing a barge.
- (2) The QADS examination found that about four minutes prior to the collision, the labels and trackers of the vessels concerned changed into a red colour, showing that the two vessels would collide. However, the VTC officer responsible did not recognise in time the red alert of the vessels and ascertain that a risk of collision was being developed between the two vessels. He only gave advice to the vessels concerned just one minute before the collision.
- (3) Similar observations (i.e. late advice/warning given to vessels by the VTC) were made by the QADS in examining seven other marine incidents during the period.

(b) Failure to follow guidelines/procedures after incidents

- (1) According to the VTC operation guidelines, immediately after the occurrence of a marine incident, a designated radio channel should be used for the communication between the VTC and the vessel involved.
- (2) On 3 September 2004, two vessels collided. The QADS found that the communication between the VTC and the vessels involved was not directed to a designated radio channel immediately after the incident.
- (3) On 7 September 2004, the VTC staff were reminded of the requirement that a designated radio channel should be used for the communication between the VTC and the vessels involved in a marine incident.
- (4) On 8 September 2004, another marine incident occurred. No action was taken to designate a radio channel for the communication between the VTC and the vessels involved, despite the fact that the VTC staff had been reminded of the requirement a day earlier.
- (5) Similar observations were made by the QADS in examining four other marine incidents which occurred during the period.

(c) Insufficient attention paid to collision warning shown on radars

- (1) If the radar system of the VTC detects that two vessels are too close, a red collision alert will appear on the radar screen to warn the VTC staff responsible, who should provide timely precautionary advice or warnings to the vessels involved.
- (2) On 19 August 2004, two vessels collided. The QADS found that the responsible VTC staff did not notice the collision alert on the radar screen. Therefore no advice or warning was issued to the vessels involved.
- (3) In another marine incident on 24 February 2005, two vessels collided. The QADS again found that the VTC had not issued any precautionary advice or warnings to the vessels involved prior to the incident.
- (4) Similar observations were made by the QADS in examining three other marine incidents which occurred during the period.

Source: MD records

**Locations of anti-speeding operations
(2004 to 2007)**

Location	Number of special operations conducted	Number of incidents	Number of complaints
Tai Po	0	0	1
Tai Tam Bay	0 } 0	0 } 0	7 } 14
Deep Water Bay			
Tathong Channel	0	0	0
East Lamma Channel	0	0	0
Kap Shui Mun Fairway	0	0	0
Hung Hom Fairway	2	0	1
Western District Public Cargo Working Area	2	0	2
Southern Fairway	1 } 2 } 2 } 2 } 14 2 } 5 }	0 } 0 } 0 } 0 } 0 0 } 0 }	0 } 0 } 0 } 0 } 0 0 } 0 }
Central Fairway			
Northern Fairway			
Sha Kei Wan Typhoon Shelter			
Cheung Chau Typhoon Shelter			
New Yaumatei Typhoon Shelter			
Yaumatei Fairway	5	0	1
Tuen Mun Typhoon Shelter	8	0	2
Harbour	8	0	1
Sai Kung	12	1	4
Aberdeen Typhoon Shelter	17	0	2
Total	68	1	28

Source: Audit analysis of MD records

Examples of revoked prosecution cases examined by Audit

(a) Failure to obtain necessary evidence

In November 2006, an oil leakage incident occurred at the China Ferry Terminal. After an investigation, the responsible patrol officer charged two parties for causing the oil leakage. However, it was later found out that the patrol officer concerned did not obtain, as required in such cases, a cautioned statement from the accused and a statement from the expert witness. The supervisory officer also failed to note the omission. The case was eventually revoked due to insufficient evidence.

(b) Failure to issue summonses within the statutory time limit

Fishing vessels licensed in Hong Kong are required to berth at designated areas and apply to the MD for port clearance before their departure. In June 2004, a fishing vessel owner was found to have breached this requirement. However, no action was taken to initiate prosecution action until September 2005. By then, the total time lapsed was about 15 months which exceeded the statutory time limit. The case was therefore revoked.

(c) Loss of case file and enclosed evidence

In December 2004, a vessel owner was found to have committed three offences, namely (a) speeding; (b) vessel underway without certified engineer; and (c) vessel not being licensed. The prosecution action was later terminated because the case file containing all the information and evidence was found lost.

Source: MD records

Determination of targeting factor values

Factor	Target factor value to be assigned
Age of vessel	0 — 5 years: 0 point 6 — 10 years: 5 points 11 — 15 years: 10 points 16 — 20 years: 10 points and an additional point for each year exceeding 15 years > 20 years: 15 + 2 points for each year exceeding 20 years
Type of vessel	4 points for the vessel types including oil tanker, chemical tanker, bulk carrier, general cargo/multi-purpose ship, refrigerated cargo carrier, roll-on/roll-off vessel (Note), and passenger ship, which are 15 years of age and over 0 point for all others
Flag of vessel	1 point for each percentage point in excess of overall regional average detention rate, based upon 3 year rolling average figures
Deficiency	0.6 points for each deficiency found in last 4 initial inspections and follow up with new deficiency
Detention	Number of detentions in the last 4 inspections: 0 detention: 0 point 1 detention: 15 points 2 detentions: 30 points 3 detentions: 60 points 4 detentions: 100 points
Classification society	International Association of Classification Societies (IACS) member: 0 point Non-IACS member: 10 points
Outstanding deficiencies	2 points for each outstanding deficiency recorded in the last inspection
Time since last inspection	6 to 12 months: 3 points 12 to 24 months: 6 points Over 24 months or never inspected in the region (including new ships): 50 points

Source: Tokyo MOU

Note: Roll-on/roll-off vessels are designed to carry wheeled cargo such as automobiles, trailers or railroad cars. They have built-in ramps which allow the cargo to be efficiently “rolled on” and “rolled off” the vessels when in port.

Examples of performance targets for regulating vessel movements

Port authority	Performance target
Canadian Coast Guard	<ul style="list-style-type: none"> • Coverage of radio communication network • Operational availability of the vessel traffic service system (e.g. radar and radio network) • Time taken to respond to calls from vessels • Time taken to relay safety information in broadcasts
Australian Maritime Safety Authority	<ul style="list-style-type: none"> • Time taken to broadcast safety information • Successful rate of transmitting safety messages
Port of London Authority	<ul style="list-style-type: none"> • Operational availability of the vessel traffic service system (e.g. radar and radio network)

Source: Audit research

Acronyms and abbreviations

AIS	Automatic Identification System
ANMU	Aids to Navigation and Mooring Unit
APCIS	Asia-Pacific Computerised Information System
Audit	Audit Commission
CCTV	Closed circuit television
COR	Controlling Officer's Report
EDLB	Economic Development and Labour Bureau
GLD	Government Logistics Department
GPS	Global Positioning System
HPS	Harbour Patrol Section
IACS	International Association of Classification Societies
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
LPFS	Licensing and Port Formality Section
MD	Marine Department
MIS	Management information system
OGVs	Ocean going vessels
PSC	Port State Control
QADS	Quality Assurance and Development Section
RTV	River trade vessels
Tokyo MOU	Memorandum of Understanding on Port State Control in the Asia-Pacific Region
VTC	Vessel Traffic Centre