CHAPTER 2

Marine Department

Procurement and maintenance of government vessels

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Audit Commission
26th floor, Immigration Tower
7 Gloucester Road
Wan Chai
Hong Kong

Tel : (852) 2829 4210
Fax : (852) 2824 2087
E-mail : enquiry@aud.gov.hk

PROCUREMENT AND MAINTENANCE OF GOVERNMENT VESSELS

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PROCUREMENT AND MAINTENANCE OF GOVERNMENT VESSELS

Executive Summary

1. According to the Stores and Procurement Regulations (SPRs), the Marine Department (MD) is the designated endorsement authority and agent for procurement of government vessels. It aims to provide cost-effective marine transport services to government departments. The Government Fleet Division (GFD) of the MD is responsible for the design, procurement and maintenance of government vessels, and managing the Government Dockyard which is the operational and maintenance base of government vessels. As at 31 March 2017, the government fleet comprised 848 vessels under the operational control of 14 government departments. Among the 848 vessels, 115 were mechanised vessels, 72 were high-speed craft and the remaining 661 were smaller size or non-mechanised vessels. New vessels are purchased to maintain or improve the safety and efficient operation of the departments. As at 31 August 2017, there were 28 ongoing projects with funding approval of $2,653 million for the procurement of 94 new vessels for seven government departments. In 2016-17, the MD spent $139.4 million on the procurement of maintenance services for the government fleet and $141.9 million on the procurement of maintenance materials. The Audit Commission (Audit) has recently conducted a review to examine the MD's work on the procurement and maintenance of government vessels with a view to identifying areas for improvement.

Procurement of government vessels

2. The Government New Construction Section (GNCS) under the GFD is responsible for the procurement of government vessels, such as liaising with user departments on their requirements, designing, procuring and supervising the construction of new vessels. According to a GFD Circular of 2008, in planning for the replacement of aged vessels, the GFD would usually conduct condition assessments not more than three years before the expiry of their expected lifespans. Depending on the hull types, the expected lifespans of vessels ranged from 8 to 20 years. The duration for acquiring new vessels generally takes three to five years (paras. 1.6 and 2.2).

3. ***Ageing of major government vessels.*** Audit analysis revealed that the average ages of the four major classes of government vessels had increased significantly in the past 10 years from 2007 to 2016, i.e. from 12.3 to 16.1 years for major mechanised vessels, from 7.8 to 13.2 years for minor mechanised vessels, from 5.4 to 14.2 years for high-speed craft (large type) and from 10.7 to 13 years for high-speed craft (medium type). As at 31 March 2017, 76 (41%) of 187 mechanised vessels and high-speed craft had served beyond their expected lifespans by 1 to 12 years, up from 33 (18%) of 183 such vessels in March 2012. Timely replacement of aged vessels is important for operational effectiveness and efficiency (paras. 2.3, 2.4 and 2.7).

4. ***Five-year rolling plan/10-year replacement plan not prepared until December 2016.*** According to the GFD Circular of 2008, the GFD would compile a five-year rolling plan on procuring new or replacement government vessels each year. However, the GFD had not done so until December 2016 when it started to work out with major user departments a tentative 10-year vessel replacement plan. According to the MD, the GFD Circular had been under review since its issue in 2008, and setting up a rigid mechanism for replacing government vessels simply according to their expected lifespans might not necessarily serve well the purpose of meeting the operational needs of the user departments. In examining the July 2017 vessel replacement plan provided by the MD, Audit found that only 54 (71%) of the 76 vessels (see para. 3 above) serving beyond their expected lifespans had been included in the replacement plan. For the remaining 22 (29%) vessels not included in the plan, the MD had not conducted condition assessments for 2 vessels (for one year and six years respectively after passing their expected lifespans) and there were inadequate follow-up actions on the condition assessment results for 18 of the other 20 vessels (paras. 2.2, 2.5 and 2.6).

5. ***Slow progress in implementing vessel procurement projects.*** As at 31 August 2017, the MD was managing 25 ongoing procurement projects for 90 vessels of the four major classes (see para. 3 above), eight of which were approved by the Finance Committee (FC) of the Legislative Council and the remaining 17 projects were approved by the Legislative Council in the context of the Appropriation Bill or by the Financial Secretary. Five of the eight FC approved projects could not meet their target dates of vessel delivery (from August 2013 to March 2017). The delays ranged from 5 months to 4 years up to August 2017, with three projects still in tender stage. As a result of the delays, additional commitments totalling $33.2 million (14% in excess of the approved funding) were required to cater for the increase in construction costs of the 8 vessels involved in four of these

five projects. For the other 17 projects, seven (involving 19 vessels) were approved before 2013-14. The progress of three projects was particularly slow, i.e. they were still in the tender stage some five years after funding approval. As a result of the delays, additional commitments totalling $58.77 million (37% in excess of the approved funding) were required to cater for the increase in construction costs of the 19 vessels involved in the seven projects (paras. 2.9 and 2.10). Factors contributing to the delays in implementing vessel procurement projects are summarised in paragraphs 6 to 9 below.

6. ***Long time taken to review the marking scheme for tender assessment.*** It had been the practice of the MD to use a marking scheme for assessing tenders of a vessel procurement project with value exceeding $1.43 million. Upon the request of the Central Tender Board (CTB) in December 2009, the MD tasked the GNCS to conduct a review of the tender marking scheme in consultation with relevant parties (e.g. the Department of Justice (DoJ)). In the event, the review was completed in October 2012 when the CTB approved the revised marking scheme. During the almost three-year period from December 2009 to October 2012, 9 projects for the procurement of 29 vessels with total approved funding of $263.7 million were postponed for periods ranging from 4 months to 2.8 years pending the finalisation of the review. According to the SPRs, departments may consider the use of a marking scheme for tender evaluation where the quality of the service/product to be procured is of paramount importance. There was no record to show that the MD had responded to DoJ's suggestion of December 2010 to review the need for using a marking scheme. It turned out that the GNCS only used marking schemes for 3 projects after the CTB's approval in October 2012. There was also no record of the MD's senior management's monitoring of the GNCS's work on the marking scheme review from 2010 to 2012 (paras. 2.12 to 2.15).

7. ***Shortage of Surveyors of Ships (SoSs).*** The SoSs in the GNCS play the role of marine engineers and naval architects in the construction of new vessels. However, the MD has been experiencing difficulties in recruiting SoSs since 2007. While the MD had implemented some stop-gap measures in the recruitment exercises (such as relaxation of requirements on language proficiency and granting of incremental credit for working experience) since 2014, the average number of SoSs successfully recruited in each exercise was only 3.2 against the targets of 7 to 10 recruits. For the GNCS, the MD obtained approval to create time-limited SoS posts in 2013 and 2016 to speed up the clearance of vessel procurement project backlog. However, from March 2013 to March 2017, the GNCS continued to carry 1 to 3 SoS vacancies. As a result, the MD informed relevant user departments in

2013 and 2015 that there would be delays in the vessel procurement projects due to the shortage of SoS grade staff. In 2016, the Steering Committee on Systemic Reform of the MD (Steering Committee) set up by the Transport and Housing Bureau (THB) recommended a grade structure review to address the critical manpower shortage and succession problems of the SoS and Marine Officer grades staff (paras. 1.13 and 2.17 to 2.21).

8. ***Slow progress in outsourcing project management work to clear backlog.*** With the addition of 4 new procurement projects after the approval of the revised marking scheme in October 2012 (see para. 6 above), there were a total of 13 outstanding projects (costing over $1.43 million each) up to April 2013. As another measure to clear the backlog, the MD obtained funding of $35.44 million from the THB in October 2013 to engage consultants from 2014-15 to 2016-17 to manage 10 projects for the procurement of 26 vessels. However, up to August 2017, the MD only engaged consultants to assist in the management of 6 procurement projects of 16 vessels. Of the backlog of 13 procurement projects, only 3 had been completed. Of the 10 outstanding projects, 5 were still in the tender stage. Audit considers that the MD needs to expedite action to clear the backlog, including speeding up the outsourcing of project management work to consultants (paras. 2.23, 2.24 and 2.27).

9. ***Discrepancies in tender documents.*** In examining a delayed procurement project for replacing an aged MD vessel, Audit noted that the delay was partly attributable to the discrepancies found between the tender notice and the tender document in relation to the overall length and breadth of the vessel during the tender evaluation process in August 2016. When granting approval to the MD for cancellation of the tender, the Government Logistics Department Tender Board commented that the cancellation could have been avoided had the MD exercised due diligence in the preparation of the tender notice and the tender document. In April 2017, the procurement contract was re-tendered. As a result, the project was delayed by one year when comparing the closing dates of the first tender and the re-tender. There is a need for the MD to step up the checking of the accuracy and consistency of tender documents (paras. 2.28 and 2.29).

10. ***Frequent machine failure of two new vessels.*** In February 2015, two new patrol launches were delivered and formally accepted by the MD after completion of the necessary acceptance tests. During the warranty period from February 2015 to February 2016, defects including abnormal shutdown of the generator set and frequent

shutdowns of the outboard engines were found in one of the launches. As a result of repair works for the defects, the total downtime of the launch from February 2015 to March 2017 was 196 days (27% of a 2-year period). As for the second launch which also experienced problems with its generator set and one of its outboard engines mainly after the warranty period, its downtime was 22.5 days during the warranty period and 103 days in the year immediately after the warranty period. While the total downtime appeared excessive for new vessels, up to August 2017, the MD had not conducted a review in this regard (paras. 2.33 and 2.35).

Maintenance of government vessels

11. According to its Controlling Officer's Report (COR), the MD aims to provide cost-effective maintenance services to the user departments. Maintenance work includes preventive service and running repair (which is corrective in nature). The MD has outsourced most of the vessel maintenance work (over 90% in terms of contract value). The Maintenance Section of the GFD is responsible for administering the maintenance contracts and providing in-house maintenance service such as urgent minor repairs. An on-line computerised information system, known as the Government Fleet Information System (GFIS), is employed to coordinate the maintenance activities and support services (paras. 1.9 to 1.11 and 3.2).

12. ***Vessel availability rate on a decreasing trend.*** The MD's work on the maintenance of government vessels is important to support the work of various user departments, especially the disciplined services departments in carrying out law enforcement and emergency duties. The MD has set a performance target at 87% in its COR to monitor the availability of government vessels to all users. Audit's examination revealed that the vessel availability rates as reported by the MD decreased from 88.8% in 2007 to 86.1% in 2016. For three years in 2009, 2015 and 2016, the availability rates were below the target of 87%, ranging from 86.1% to 86.4% (para. 3.3).

13. ***Inadequacies in reporting vessel availability rates.*** While the MD stated in its COR that the target vessel availability rate was set for all users, Audit found that the reported availability rates in fact only covered two of four major classes of government vessels (i.e. major mechanised vessel and high-speed craft (large type)). Audit also found that the downtime for repair carried out outside the Government Dockyard was not taken into account in the calculation of the availability rates as the MD considered that the vessels in such cases were still under the control and operation

of the user departments. The current practice of calculating and reporting the vessel availability rate without any explanatory note may cause misunderstanding to users of the COR. In Audit's view, the MD needs to consult relevant stakeholders (including user departments and the THB) in this regard (paras. 3.5 and 3.6).

14. ***Increase in downtime of major government vessels.*** From 2012 to 2016, the total downtime of four major classes of government vessels due to preventive service and running repair increased from 6,583 days by 24.6% to 8,201 days, while the total number of such vessels only increased from 183 by 2.2% to 187. The average downtime per vessel had increased from 36 days in 2012 by 22% to 44 days in 2016. While the main reason for the increase in downtime was the ageing problem of the government fleet, Audit has found room for improvement in managing the preventive service and running repair (paras. 3.7 to 3.9):

(a) ***Preventive maintenance scheduling.*** At the beginning of each year, the MD provides a preventive maintenance schedule to each user department showing the budgeted downtime of each of the specified vessels in the schedule. The scope of maintenance work is drawn up based on the defect list provided by the user department and the MD's pre-docking inspections of the vessels concerned. Based on the MD's records, the total extra downtime (i.e. actual maintenance downtime exceeding budget) increased by sevenfold from 55 days in 2012 to 457 days in 2016. Extra downtime is disruptive to the normal operation of the user departments and should be minimised as far as possible. The MD needs to look into the contributing factors (such as extra work not covered in service contracts and waiting time for spare parts) to see whether there is room for improvement (paras. 3.10 to 3.12); and

(b) ***Running repair.*** While the MD has put in place procedures for monitoring the downtime for running repair, there is also a need to review running repair cases occurring shortly after preventive service to see if there are lessons to be learnt. Based on the MD's records as at 25 July 2017, there were five such repair cases, including a case whereby a high-speed craft sustained serious flooding of the engine within two months after receiving preventive service (para. 3.13).

15. ***Need to enhance competition in the procurement of maintenance services.*** The MD lets out its maintenance contracts by either term contracts (for providing

specific types of maintenance service such as engine maintenance) or one-off contracts (for providing preventive service of a particular vessel or small-scale urgent repair service). In 2016-17, the MD had 33 term contracts at a total estimated contract value of $29.1 million all awarded by quotations. Among the 33 term contracts, Audit noted that 23 (70%) were each awarded to the only bidder, indicating that there had been limited competition in the procurement exercises. There is a need to explore measures to make the contracts more attractive to potential bidders (paras. 3.15 and 3.18):

(a) ***Measures taken to lengthen the duration of one-year term contract.*** Of the 33 term contracts in 2016-17, 16 (48%) were one-year contracts (for 3 consecutive terms in 15 cases and for 2 consecutive terms in one case). Audit noted that the MD had commenced a review of the term contracts' duration since January 2017. Up to August 2017, 21 out of 25 term contracts had been awarded with a two-year term. Among these 21 two-year term contracts, 8 were one-year contracts, 5 were 1.5-year contracts and 8 were 2-year contracts in their respective preceding terms (para. 3.19); and

(b) ***Need to consider bundling of similar services in a single contract.*** Audit examination of the 16 one-year term contracts in 2016-17 (see (a) above) revealed that 9 (56%) contracts were for providing related services, e.g. 6 contracts were for the repair and maintenance of engines of police vessels/speed craft. Audit noted that these 9 contracts were of small values, ranging from $0.49 million to $1.4 million. The MD needs to consider bundling related maintenance services into reasonably sizeable contracts to reduce the cost of contract administration and make them more attractive to potential bidders (para. 3.20).

Management of maintenance materials

16. ***Need to take timely follow-up action on obsolete/dormant stocks.*** The MD spent, on average, $132.2 million a year on procuring maintenance materials. As at 31 March 2017, the value of some 17,000 stock items of maintenance materials was $274 million. After a stock review in July 2013, the Supplies Services Unit (SSU) of the Finance Section identified 8,023 items of slow-moving stock (i.e. those without movement for over five years). In April 2015, the SSU indicated that it intended to review the 8,023 slow-moving items by phases. In July 2016, 68 of 547 items covered in the first phase review were disposed of. According to the MD, follow-up action

on the remaining 7,476 (8,023 less 547) items could only be taken starting from January 2017 because there was a need to prioritise reform work of the GFD and the need to identify expertise to undertake the task. However, the delay of some 4 years before taking follow-up action on such items is unsatisfactory as any obsolete/dormant stock could not be disposed of in a timely manner to save storage space and realise any resalable value where commercial disposal is applicable. Moreover, with the lapse of time, the slow-moving stock had increased to 8,412 items (5% up from 8,023 in 2013) with a total value of $73 million as of June 2017 (34% up from $54.6 million in 2013) (paras. 4.2, 4.3 and 4.5 to 4.8).

17. ***Deficiencies of the GFIS for stock management purposes.*** Notwithstanding the system enhancements in 1999 and 2015, some intended benefits of the GFIS could not be realised. For example, the re-order levels generated by the GFIS could not fully reflect the current stock replenishment practice of the Government Dockyard. Moreover, while the GFIS could generate barcodes for inventory items in the Government Dockyard stores, Audit found that they could not be used to automate the stock management operations (para. 4.10).

18. ***Management of dangerous goods in the Government Dockyard.*** In the course of repairing or maintaining government vessels in the Government Dockyard, the MD's in-house staff and contractors are required to handle dangerous goods (such as diesel and petrol, oxygen and acetylene gas cylinders, and paints and thinner) controlled under the Dangerous Goods Ordinance (Cap. 295). While the provisions of the Ordinance do not apply to the Government, the MD is committed to minimising potential hazards and risks, and ensuring that all its staff and workers work in a safe and healthy environment (paras. 4.1 and 4.14). Audit examination revealed the following issues in the management of dangerous goods in the Government Dockyard:

(a) ***Handling of diesel and petrol.*** According to the MD, while user departments had been advised to keep the quantity of fuel in a vessel to the minimum before it entered the Government Dockyard for service, there might be practical difficulties to do so for vessels returning for unscheduled running repairs or vessels of the law enforcement agencies which needed to carry certain quantities of fuels for operational reasons. In 2016, the fuel tanks of 39 petrol-fuelled vessels arriving at the Government Dockyard for maintenance/repair were 68% full on average. As a result, the Government Dockyard had to handle large quantity of petrol unloaded from these vessels. According to the MD's consultancy study of 2016-17, there

was a long travelling distance for the transfer of fuels from the defueling area to the designated dangerous goods stores. Manual handling of fuels further increased the possibility of accidents (paras. 4.17(a) and 4.18(a));

(b) ***Storage of oxygen and acetylene cylinders.*** According to GFD (Government Dockyard) Safety Management Manual, maintenance contractors (which bring along their own oxygen and acetylene cylinders to the Government Dockyard for welding and cutting of metal) should keep their number of gas cylinders at a minimum and keep excessive gas cylinders in the specified dangerous goods stores. However, Audit found that the MD had not tracked the quantities of oxygen and acetylene cylinders stored/used by the maintenance contractors in the Government Dockyard. According to the MD's 2016-17 consultancy study, gas cylinders were not returned to the designated stores after daily operation due to the long distance from the boat repair sheds. Audit inspections in August 2017 revealed that such practice had continued (paras. 4.14(b), 4.17(b) and 4.18(b)); and

(c) ***Storage of paints and thinner.*** According to the MD's 2016-17 consultancy study, the long distance from the boat repair sheds also discouraged the return of unused paints and thinner to the designated dangerous goods stores after daily operation. Audit examination revealed that on 5 occasions in 2017, paints of 399 to 579 litres and thinner of 65 to 124 litres were issued to the maintenance contractors for painting work of 5 vessels. According to the MD, the entire painting operation might take about 10 days depending on various factors such as vessel size, weather and humidity. There was no record to show that the unused paints/thinner had been returned to the dangerous goods stores after daily operation (paras. 4.17(c) and 4.18(c)).

In March 2017 the MD engaged another consultant to provide advice on how the Government Dockyard could better manage the dangerous goods to meet both its operational needs and the requirements of the Dangerous Goods Ordinance. While waiting for the completion of the study in 2018, the MD needs to implement additional interim measures to minimise the safety hazards (paras. 4.19 and 4.20).

Audit recommendations

19. **Audit recommendations are made in the respective sections of this Audit Report. Only the key ones are highlighted in this Executive Summary. Audit has *recommended* that the Director of Marine should:**

(a) **improve the overall planning for the procurement of new and replacement government vessels (para. 2.36(a));**

(b) **sustain the improvement measures taken in monitoring the GFD's work to ensure the timely delivery of vessel procurement projects (para. 2.36(b));**

(c) **expedite action to clear the backlog of vessel procurement projects, including implementing the Steering Committee's recommendations in addressing the manpower shortage and succession problems of SoS grade staff (para. 2.36(c));**

(d) **step up the checking of the accuracy and consistency of tender documents (para. 2.36(d));**

(e) **closely monitor the decreasing trend in vessel availability rates and take effective measures to achieve the target rate of 87% (para. 3.26(a));**

(f) **explore if there are better ways to report vessel availability rates in the COR (para. 3.26(b));**

(g) **closely monitor the increasing trend in downtime and take effective measures to minimise the extra downtime for preventive service (para. 3.26(c));**

(h) **continue to enhance competition in the procurement exercises of vessel maintenance services (para. 3.26(e));**

(i) **step up stock review to identify slow-moving stock items and take timely follow-up actions to dispose of any obsolete/dormant stock (para. 4.12(a)); and**

(j) **implement additional interim measures to minimise the safety hazards in the Government Dockyard (para. 4.21(b)).**

Response from the Government

20. The Government agrees with the audit recommendations.

PART 1: INTRODUCTION

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

Background

1.2 Hong Kong has a sheltered natural harbour which provides good access and a safe haven for vessels calling at the port. The Marine Department (MD), under the policy directives of the Transport and Housing Bureau (THB) and headed by the Director of Marine, is responsible for all navigational matters in Hong Kong and the safety standards of all classes and types of vessels.

1.3 According to the Stores and Procurement Regulations (SPRs), the MD is the designated endorsement authority and agent for procurement of government vessels. The MD aims to provide cost-effective marine transport services to government departments. In 2016-17, the MD incurred expenditure of $562.3 million (Note 1) on the management of the government fleet which involved:

(a) coordinating the procurement of new government vessels and monitoring their construction and commissioning;

(b) performing planned and unplanned maintenance of government vessels; and

(c) operating its crewed fleet and providing marine transport services to other government departments.

1.4 The MD is organised into five divisions and an Administration Branch with an establishment of 1,411 staff as at 31 March 2017 (see Appendix A for an extract of the MD's organisation chart). The Government Fleet Division (GFD) is responsible for the design, procurement and maintenance of government vessels. The GFD manages the Government Dockyard which occupies a site of 9.8 hectares on

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Note 1: *This included, among other things, the capital costs of vessels acquired by the MD but not those acquired by other user departments at their own costs.*

Stonecutters Island (including an 8.3-hectare protected water basin) and serves as the operational and maintenance base of government vessels (Note 2).

Government fleet

1.5 As at 31 March 2017, the government fleet comprised 848 vessels of different types, power ratings, speeds and sizes under the operational control of 14 government departments (see Appendix B), which were all maintained by the MD. Of these vessels, the MD managed 58 vessels for its port operations and for serving other government departments which did not have their own fleets (Note 3). The 848 government vessels comprised 94 major mechanised vessels, 21 minor mechanised vessels, 72 high-speed craft and 661 smaller size or non-mechanised vessels (e.g. lighters, beach craft/rafts, dinghies and inflatable boats). The 94 major mechanised vessels were operated in the following manner:

(a) 25 vessels were manned and operated by MD crew staff. These vessels were used for supporting the MD's operations and meeting the marine transport needs of other departments which did not have their own fleets;

(b) 16 vessels were under the operational control of 6 government departments (e.g. the Immigration Department (ImmD) and Department of Health) but their crews were provided and managed by the MD; and

(c) 53 vessels were manned and operated by the staff of the departments concerned (e.g. the purpose-built vessels of the Hong Kong Police Force (HKPF) and Fire Services Department (FSD)).

The government vessels are essential for the safe and efficient operation of the 14 departments. Photographs 1(a) to (f) show some examples of the government vessels.

Note 2: *The dockyard has 10 docking covered sheds, four movable canopies and 30 open-yard docking spaces for repair and maintenance of vessels. The dockyard also has a ship-lift system and three ship travel hoists capable of dry-docking vessels of up to 750 tonnes.*

Note 3: *These vessels included patrol launches, purposely built conveyance launches, pontoons and some specialised vessels such as hydrographic survey launches and explosive carriers.*

Photographs 1(a) to (f)

Examples of government vessels

(a) Major mechanised fireboat of the FSD	**(b) Minor mechanised vessel of the Agriculture, Fisheries and Conservation Department**
	
(c) High-speed craft (large type) of the HKPF	**(d) High-speed craft (medium type) of the HKPF**
	
(e) Lighter of the MD	**(f) Beach craft of the Leisure and Cultural Services Department**
	

Source: MD records

Procurement of government vessels

1.6 The Government New Construction Section (GNCS) under the GFD (see Appendix A) is responsible for the procurement of vessels for government departments, such as liaising with user departments on their requirements on new vessels, designing, procuring, and supervising the construction of new vessels. As of March 2017, the Section had an establishment of 11 staff, mainly of the Surveyor of Ships (SoS) grade and the Ship Inspector grade (Note 4).

1.7 The procurement process of a government vessel mainly comprises three stages:

(a) ***Planning.*** The GNCS discusses and finalises with a user department its proposed requirements, carries out a feasibility study, preliminary design and market research, and prepares a paper with budgetary estimates and recurrent cost consequences for consideration by the Standing Committee on Government Craft (SCOGC — Note 5). After endorsement by the SCOGC, the user department seeks approval of funds from the appropriate authority (e.g. the Finance Committee (FC) of the Legislative Council);

(b) ***Tendering and contract award.*** After securing funding, the GNCS finalises the technical specifications, compiles tender documents and invites tenders (Note 6). A tender assessment panel will examine tender submissions and

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Note 4: *There were 4 SoS grade staff (also see Table 5 of para. 2.20), 6 Ship Inspector grade staff and 1 Senior Clerical Officer.*

Note 5: *The SCOGC advises government departments on vessel procurement matters to ensure cost-effectiveness. Chaired by the Assistant Director of Marine (Government Fleet), its members include officers from different sections of the GFD.*

Note 6: *According to the SPRs, tender procedures shall be used for the procurement of stores and services exceeding the financial limit of $1.43 million while quotation procedures may be used for procurement within $1.43 million (with the exception of consultancy services and services for construction and engineering works which are subject to different financial limits), e.g. obtaining at least five written quotations for purchases with a value over $50,000.*

make recommendations to the relevant authorities (Note 7) for the award of contracts; and

(c) ***Delivery and deployment.*** Upon the award of a contract, the GNCS will monitor the shipbuilding contractor for the construction and delivery of the new vessel, arrange acceptance tests and sea trial, and distribute the vessel to the user department.

1.8 In 2013, the MD obtained funding of $35.44 million from the THB to engage consultants to manage 10 new vessel procurement projects. The need for outsourcing some of the project management work arose from a major review of the tender marking scheme conducted from December 2009 to October 2012 during which time all vessel procurement projects by way of tender (i.e. those costing more than $1.43 million — see Note 6 to para. 1.7(b)) and using marking scheme were held up (see paras. 2.12 and 2.13).

Maintenance of government vessels

1.9 The Maintenance Section (MS) of the GFD (see Appendix A) is responsible for maintaining the 848 government vessels (see para. 1.5). As of March 2017, the Section had an establishment of 106 staff (Note 8).

1.10 According to the MD, inspection and maintenance work required to be carried out on government vessels can be generally classified as follows:

Note 7: *According to the SPRs, the approving authorities of tenders are: (a) the Departmental Tender Committee for procurement (except works) not exceeding $5 million; (b) the Government Logistics Department Tender Board for procurement of stores/services (non-works)/revenue contracts not exceeding $30 million ($15 million prior to July 2017); (c) Public Works Tender Board for procurement of works and related services not exceeding $100 million; and (d) the Central Tender Board for procurement of all tenders exceeding the financial limits of the above tender committee/boards.*

Note 8: *There were 3 SoS grade staff, 14 Ship Inspector grade staff, 10 Mechanical Inspector grade staff, 6 Electrical Inspector grade staff, 14 Works Supervisors, 13 Senior Artisans, 43 Artisans, 1 Air-conditioning Inspector and 2 Clerical Assistants.*

(a) ***Pre-docking inspection.*** It is conducted on mechanised vessels and speed craft to identify whether there are major maintenance items that need to be followed up in the coming preventive service (see item (b) below);

(b) ***Preventive service.*** It is a scheduled maintenance service for a government vessel conducted in suitable intervals in accordance with the operating mode and conditions of the vessel. For a more comprehensive maintenance/repair, a vessel is usually lifted on a dry-dock for an overall inspection, repair and other necessary maintenance services; and

(c) ***Running repair.*** It is corrective in nature and is carried out for a vessel under emergency condition or after an accident to bring it back to a safe and operative condition for the user department.

1.11 The MD has outsourced most of the vessel maintenance work (over 90% in terms of contract value — Note 9). Staff of the MS administer the maintenance contracts, monitor the progress and standard of the contractors' work, and carry out necessary inspection and testing prior to the delivery of repaired vessels to relevant user departments. The MD stocks maintenance materials at the stores of the Government Dockyard and supplies such materials to its contractors and in-house staff for carrying out maintenance and repair work. To maximise maintenance efficiency and vessel availability, an on-line computerised information system, known as the Government Fleet Information System (GFIS), is employed to coordinate the maintenance activities and support services.

Expenditure on procurement and maintenance of government vessels

1.12 As at 31 August 2017, there were 28 ongoing projects with funding approval of $2,653 million for the procurement of 94 new vessels (Note 10) for seven government departments. In 2016-17, the MD spent $139.4 million on the

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Note 9: *The remaining in-house vessel maintenance work is mainly related to workshop jobs and minor urgent repairs. The MD has estimated the notional contract value of the in-house maintenance work by reference to the costs of labour and materials involved.*

Note 10: *The 94 vessels comprised 49 mechanised vessels, 41 speed craft, 3 mechanised inflatable boats and 1 lighter.*

procurement of maintenance services for the government fleet and $141.9 million on the procurement of maintenance materials.

Reform of the MD

1.13 In response to the call for a systemic change in the MD by the Commission of Inquiry into the collision of two passenger vessels near Lamma Island in October 2012, the THB in May 2013 set up the Steering Committee on Systemic Reform of the MD (hereinafter referred to as the Steering Committee — Note 11) to advise and steer the Director of Marine to undertake a comprehensive systemic review (Note 12) and reform of the MD. A Task Force on Reform (Note 13) had been set up in the MD to support the work of the Steering Committee and to assist the Director of Marine to take forward the Committee's recommendations.

1.14 The Task Force on Reform, with the assistance of the Efficiency Unit, had conducted a two-phased organisational review between August 2013 and January 2015 to improve the MD's regulatory functions and business procedures on ship safety and navigational safety. After completion of the review, the MD started to review the operations of the GFD, which took up over 40% of both the manpower and resources of the department, with focus on financial controls and arrangements on procurement of government vessels. Accordingly, the Director of Marine had changed the reporting line of the GNCS to the Deputy Director of Marine (Special Duties) with effect from December 2015 to achieve better synergy in reviewing the actual workload and implementing various improvement proposals more efficiently and effectively. In early 2016, the reviews on the GNCS and MS commenced and additional resources were obtained for the GNCS to expedite the procurement process (see para. 2.19).

Note 11: *The Steering Committee was led by the Secretary for Transport and Housing and two lay members who had extensive administrative and management experience.*

Note 12: *The systemic review focused on three areas, namely: (a) operational issues such as safety standards and work practices; (b) manpower strategy and training; and (c) organisational structure and operational work process of the MD.*

Note 13: *The Task Force is headed by an Administrative Officer Staff Grade B (designated as Deputy Director of Marine (Special Duties)) and underpinned by a Senior Principal Executive Officer, an Assistant Director of Marine and a team of 19 non-directorate staff to provide professional and administrative support.*

In July 2016, the whole GFD was put under the Deputy Director of Marine (Special Duties)'s purview to strengthen management oversight.

1.15 On manpower strategy and training matters, the Steering Committee noted that there were persistent manpower shortage and succession problems in the Marine Officer and SoS grades (Note 14). Despite the fact that the MD had implemented a series of stop-gap measures (see para. 2.19) to address the acute recruitment difficulties and manpower shortage of the two professional grades over the past few years, these measures were inadequate to resolve the manpower and succession problems of the two grades (see paras. 2.20 and 2.21). On the advice of the Steering Committee, the MD had been exploring ways to resolve the manpower problem of the two professional grades. In 2014, the MD commissioned a consultant to study how maritime authorities overseas tackled their recruitment and succession problems. In the light of the findings of the consultant, the Steering Committee strongly supported the creation of a new training or assistant rank through the conduct of a grade structure review for the two professional grades to offer long-term solutions to its manpower and succession problems. In May 2016, the MD sought the support of the Civil Service Bureau for the conduct of a grade structure review. On the invitation of the Civil Service Bureau in December 2016, the Standing Commission on Civil Service Salaries and Conditions of Service agreed to undertake the grade structure review and advised the MD to make a submission in this regard. In February 2017, the MD submitted its proposal for the grade structure review to the Standing Commission for its consideration.

Audit review

1.16 In 2006, the Audit Commission (Audit) completed a review of "Management of the government fleet", the results of which were reported in Chapter 4 of the Director of Audit's Report No. 46 of March 2006. In April 2017, Audit commenced a review on the procurement and maintenance of government vessels by the MD, focusing on:

Note 14: *The two core professional grades in the MD are responsible for discharging the statutory functions relating to all navigational matters in the waters of Hong Kong and the safety standards of all classes and types of vessels. In the GNCS, the SoSs are responsible for the procurement of new vessels (see para. 2.17).*

(a) procurement of government vessels (PART 2);

(b) maintenance of government vessels (PART 3); and

(c) management of maintenance materials (PART 4).

Audit has found room for improvement in the above areas and has made a number of recommendations to address the issues.

General response from the Government

1.17 The Secretary for Transport and Housing welcomes Audit's study into the procurement and maintenance of government vessels and agrees with the audit observations and recommendations. The Director of Marine also agrees with the audit recommendations.

1.18 The Director of Government Logistics has said that the Government Logistics Department (GLD) would stand ready to offer advice to the MD on its procurement and supply operations.

Acknowledgement

1.19 Audit would like to acknowledge with gratitude the assistance and full cooperation of the staff of the MD, GLD, HKPF and FSD during the course of the audit review.

PART 2: PROCUREMENT OF GOVERNMENT VESSELS

2.1 This PART examines the MD's work on the procurement of government vessels, focusing on the following issues:

(a) planning for the procurement of new and replacement government vessels (paras. 2.2 to 2.8);

(b) slow progress in implementing vessel procurement projects (paras. 2.9 to 2.32); and

(c) frequent machine failure of two new vessels (paras. 2.33 to 2.35).

Planning for the procurement of new and replacement government vessels

2.2 The GFD is responsible for maintaining efficient marine transport services for all government departments. According to GFD Circular No. 10/2008 of 2008, the GFD would routinely examine the cost-effectiveness of existing government fleet, plan ahead for their replacement with new vessels and also liaise with user departments on any of their new requirements as follows:

(a) ***Replacement of aged vessels.*** To plan for replacement, the GFD would carry out regular reviews to identify any existing vessel within three to five years from the end of its expected lifespan due for replacement (see Table 1). Usually not more than three years before the expiry of the expected lifespan, the MS (see para. 1.9) would arrange to compile a condition assessment report which included information on: (i) an assessment of the physical condition of the concerned vessel (covering its hull, machinery and electrical equipment) and the rectification required for the safe operation in its remaining lifespan; (ii) an evaluation of the average annual maintenance cost of the vessel for its remaining operating life; and (iii) an estimation of the average annual maintenance cost of a replacement vessel. The MS was tasked to advise user departments regarding the proposals on vessel replacement plan based on the information from the condition assessment reports;

Table 1

Expected lifespan of vessels of different hull types

Hull type	Expected lifespan (Year)
Steel	20
Aluminum	15
Glass-reinforced plastic	15
Rubber	8

Source: MD records

(b) ***Procurement of new vessels.*** User departments would be required to submit full justifications for acquiring new vessel(s) for their operational needs to the GNCS with the support endorsement of their respective policy bureaux. The GNCS would follow up on the necessary action in liaison with the user department concerned on the intended procurement of new vessel(s). The MS was required to give an estimate for the average annual maintenance cost of the new vessel(s); and

(c) ***Five-year rolling plan.*** The GFD would compile a five-year rolling plan on procuring new or replacement government vessels for submission to the SCOGC in April or May each year for its consideration.

The duration for acquiring new vessels generally takes three to five years.

Ageing of major government vessels

2.3 Audit analysis revealed that the average ages of four major classes of government vessels (Note 15) in service had increased significantly in the past 10 years from 2007 to 2016 (see Figure 1) as follows:

(a) ***Major mechanised vessel (MECV).*** The average age of MECVs increased by 30.9% from 12.3 years in 2007 to 16.1 years in 2016. As at 31 March 2017, there were 94 MECVs, of which 42 were steel hulled with expected lifespan of 20 years and 52 were aluminum or glass-reinforced plastic hulled with expected lifespan of 15 years;

(b) ***Minor mechanised vessel (MIMC).*** The average age of MIMCs increased by 69.2% from 7.8 years in 2007 to 13.2 years in 2016. As at 31 March 2017, there were 21 MIMCs and all of which were aluminum or glass-reinforced plastic hulled with expected lifespan of 15 years;

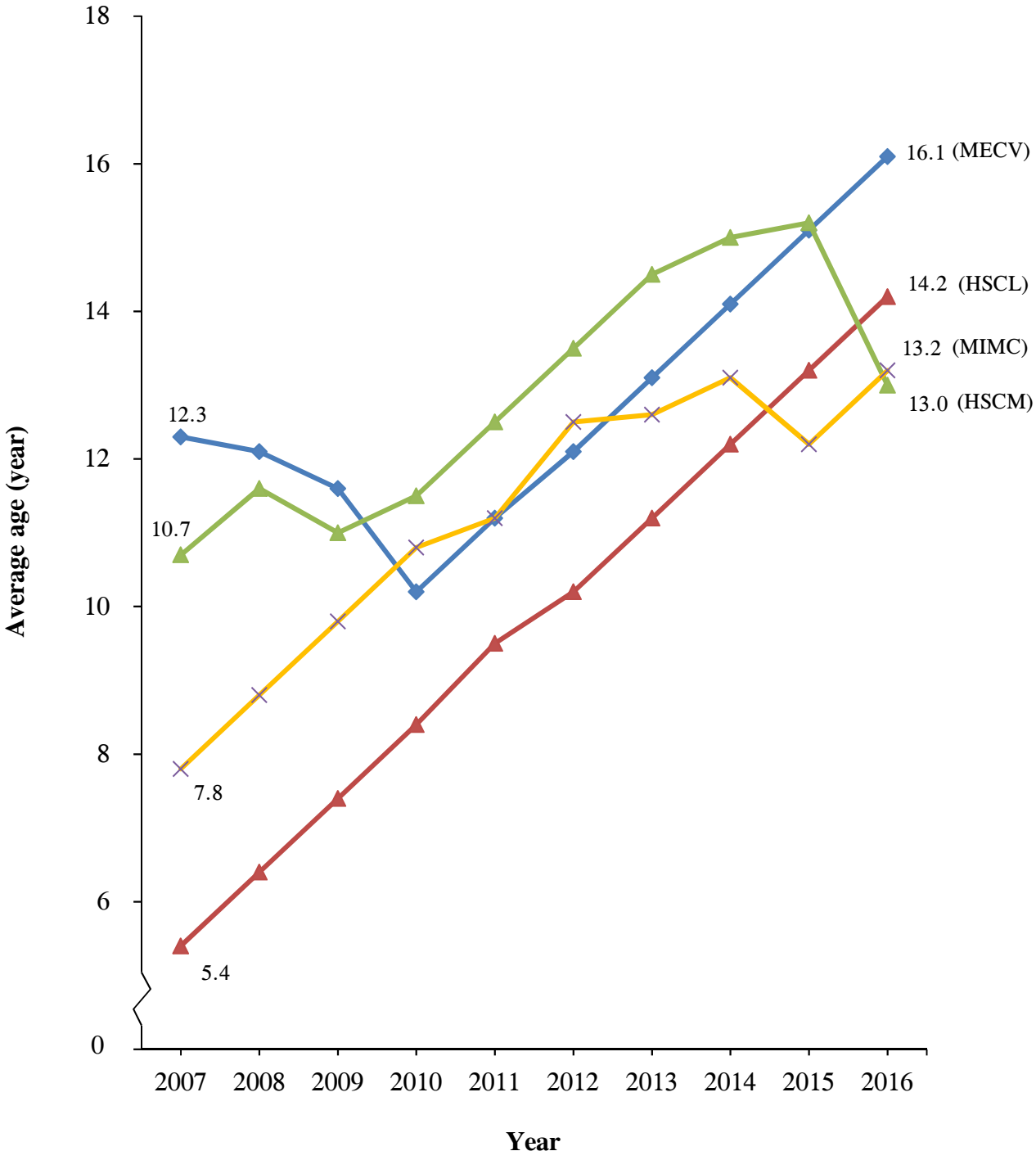
(c) ***High-speed craft (large type — HSCL).*** The average age of HSCLs increased by 163% from 5.4 years in 2007 to 14.2 years in 2016. As at 31 March 2017, there were 13 HSCLs and all of which were aluminum or glass-reinforced plastic hulled with expected lifespan of 15 years; and

(d) ***High-speed craft (medium type — HSCM).*** The average age of HSCMs increased by 21.5% from 10.7 years in 2007 to 13 years in 2016. As at 31 March 2017, there were 59 HSCMs and all of which were aluminum or glass-reinforced plastic hulled with expected lifespan of 15 years.

Note 15: *According to the MD, these four classes of vessels would incur higher maintenance expenditure and need closer monitoring and attention.*

Figure 1

Average ages of four major classes of vessels in the government fleet (2007 to 2016)



Source: Audit analysis of MD records

Operation of major government vessels beyond their expected lifespans

2.4 Audit further analysed the ages of the four major classes of vessels against their expected lifespans. Audit found that of the 187 mechanised vessels and high-speed craft in service as at 31 March 2017, 76 (41%) vessels had exceeded their expected lifespans by 1 to 12 years (see Table 2). Comparing with the position in March 2012 when only 33 (18%) of 183 such vessels were operating beyond their expected lifespans, the situation had deteriorated.

Table 2

Analysis of major government vessels serving beyond their expected lifespans (31 March 2017)

Service year beyond expected lifespan (Year)	Vessel class				Total (Number)
	MECV	MIMC	HSCL	HSCM	
	(Number)				
1 to < 5	25	2	4	12	43
5 to 12 (Note)	13	6	0	14	33
Total	38	8	4	26	76

Source: Audit analysis of MD records

Note: The average number of service year beyond expected lifespan was 7.4 years.

Five-year rolling plan/10-year replacement plan not prepared until December 2016

2.5 In response to Audit's requests for examining the five-year rolling plans specified in GFD Circular No. 10/2008 (see para. 2.2), the MD in August and September 2017 said that:

(a) since the issuance of GFD Circular No. 10/2008 in 2008, its application had been under review. Setting up a rigid mechanism for replacing government vessels simply according to their expected lifespans might not necessarily serve well the purpose of meeting the operational needs of the user departments, or fulfilling the cost-effectiveness of fully utilising individual vessels. While there was no specifically defined five-year rolling plan, the MD was progressing with the replacement projects according to user departments' requirements and making reference to the vessels' expected lifespans as one of the considerations in advising user departments on the replacement schedule of their vessels. The review of GFD Circular No. 10/2008 would take into account the experience gained from the recent reform measures undertaken by the GFD in respect of procurement, maintenance and consultation with individual user department on the timing and strategy on the procurement of new and replacement vessels; and

(b) replacement projects had been hindered by a serious shortage of professional officers in the GNCS from 2009 to 2014. Adhering to a rolling procurement plan made at that time might not be reflecting a realistic programme for the user departments. Nevertheless, following the recommendation of the 2016 audit review on "Procurement and maintenance of fire services equipment" (as reported in Chapter 3 of the Director of Audit's Report No. 67 of October 2016) which covered the FSD's vessels, the MD had started to work out with major user departments a tentative 10-year vessel replacement plan since December 2016.

2.6 According to the July 2017 vessel replacement plan provided by the MD, 54 (71%) of the 76 vessels serving beyond their expected lifespans (see Table 2 of para. 2.4) had been included in the replacement plan. For the 22 vessels not covered by the July 2017 replacement plan, Audit noted that:

(a) the MD had not conducted condition assessments (see para. 2.2(a)) for 2 vessels, i.e. one year and six years respectively after passing their expected lifespans (Note 16); and

(b) while the MD had conducted condition assessments for the remaining 20 vessels, there were inadequate follow-up actions on the assessment results for 18 vessels, as follows:

(i) 8 vessels (5 belonging to the Agriculture, Fisheries and Conservation Department (AFCD) and the other 3 to the MD) had been advised by the MS 5 months to 7.5 years ago that they should be replaced, but up to July 2017 they were still in service;

(ii) according to the assessment results 3 to 7.5 years ago, 6 vessels could remain in service for another 2 to 3 years subject to further assessments. However, further assessments had not been carried out since then; and

(iii) for the remaining 4 assessed vessels, the MS had not advised the concerned user departments whether they should be replaced or required further assessment.

2.7 Timely replacement of aged vessels is important for operational effectiveness and efficiency. In its request for funding from the THB to outsource the project design and management work of vessel procurement projects in 2013 (see para. 1.8), the MD stated that if the procurement projects could not be processed in time, they might result in: (a) over-budget due to increase in shipbuilding costs

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Note 16: *In September and October 2017, the MD informed Audit that: (a) the two vessels were specialised vessels for pollution control and mainly put on stand-by mode for emergency readiness, i.e. oil pollution at sea. While the two vessels were generally maintained in good working condition due to their operational modes, the MD would carry out condition assessments during their coming preventive services; and (b) the MD was mindful that condition assessment was one of the measures to monitor a vessel's safe operating condition. The MD would also take into account the need to conduct such an assessment based on the actual condition observed during preventive services and running repairs in line with the value-for-money principle.*

(see paras. 2.9 and 2.10); and (b) significant increase in maintenance costs and extra downtime. An aged vessel is also not desirable for the smooth operation of the user department. In this connection, Audit noted that the Security Bureau wrote to the THB in August 2013 expressing concern over the delay in vessel replacement/procurement projects which could hamper the operational efficiency of the law enforcement agencies in responding to emergency incidents. The THB reassured the Security Bureau that measures had been taken to expedite the procurement process by providing additional resources to the MD to employ consultants for project management work, and to create time-limited posts to complete the outstanding and new anticipated projects.

2.8 In light of the ageing trend of government vessels, the MD needs to improve its overall planning for the procurement of new and replacement vessels, including:

(a) expediting action to complete the review of GFD Circular No. 10/2008 (see para. 2.5(a)) regarding its requirement on compiling a five-year rolling plan; and

(b) closely monitoring the safety of aged vessels by conducting condition assessments in a timely manner and in consultation with user departments, taking prompt follow-up actions on the assessment results.

Slow progress in implementing vessel procurement projects

2.9 As at 31 August 2017, the MD was managing 25 ongoing procurement projects for 90 vessels of the four major classes (see para. 2.3), eight of which were approved by the FC and the remaining 17 projects were approved by the Legislative Council in the context of the Appropriation Bill (i.e. they were included in the annual draft estimates of the General Revenue Account) or by the Financial Secretary under delegated authority in accordance with the Public Finance Ordinance (Cap. 2). Audit analysis revealed that five FC approved projects could not meet their target dates of vessel delivery (with delays ranging from 5 months to 4 years up to August 2017) as stated in the relevant FC papers (see Table 3). As a result of the delays, additional commitments totalling $33.2 million (14% in excess of the approved funding) were required to cater for the increase in construction costs of the 8 vessels involved in four of these five projects.

Table 3

Target vessel delivery dates not met in five FC approved vessel procurement projects (31 August 2017)

Item	Vessel procurement project	Original expected delivery date	Status as at 31 August 2017
1	In January 2012, the FC approved funding of $19.6 million for the Correctional Services Department to replace a vessel for conveying persons in custody of high security grading, which was expected to reach the end of its serviceable life in 2013.	Aug 2013	Contract awarded in August 2017 and shipbuilding in progress for expected delivery in February 2019 (see item 6 of Table 6 in para. 2.24)
2	In April 2012, the FC approved funding of $17.1 million for the Customs & Excise Department (C&ED) to replace a speed craft which had been in service since 2003 and sustained damage beyond economic repair during an anti-smuggling operation in 2010.	Jan 2014	Tender evaluation in progress and contract to be awarded in October 2017 (see item 2 of Table 6 in para. 2.24)
3	In June 2012, the FC approved funding of $85 million for the FSD to replace an aluminum-hulled fireboat (with expected lifespan of 15 years — see Table 1 in para. 2.2(a)) which had been in service since 1990.	Sep 2014	Tender evaluation in progress and contract to be awarded in November 2017
4	In May 2013, the FC approved funding of $114 million for the HKPF to replace five aluminum-hulled speedboats which had been in service since 1999, including one which had been damaged beyond economic repair in 2012.	Mar 2016	Tender documents under preparation (Note)
5	In January 2014, the FC approved funding of $46.4 million for the MD to replace four vessels which had been in service since 1995.	Mar 2017	Contract awarded in June 2016 and shipbuilding in progress for expected delivery in November 2017

Source: *Audit analysis of MD records*

Note: *According to the MD, the technical specifications were finalised and it was awaiting the HKPF's advice on the tender approach.*

2.10 Of the 17 vessel procurement projects approved in the context of the Appropriation Bill or by the Financial Secretary (see para. 2.9), seven were approved before 2013-14. Audit found that the progress of three of them was particularly slow, i.e. they were still in the tender stage up to 31 August 2017, some five years after funding approval (see Table 4). As a result of the delays, additional commitments totalling $58.77 million (37% in excess of the approved funding) were required to cater for the increase in construction costs of the 19 vessels involved in these seven projects.

Table 4

Delays in implementing vessel procurement projects with funding approval before 2013-14 (31 August 2017)

Item	Vessel procurement project	Year of funding approval	Status as at 31 August 2017
1	Provision of $9.9 million for the replacement of one launch of the ImmD which had been in service since 1992	2010-11	Shipbuilding in progress (per contract awarded in June 2016)
2	Provision of $9.7 million for the replacement of a vessel of the MD which had been in service since 1995	2011-12	Tender evaluation in progress
3	Provision of $21 million for the procurement of three new speed craft for the HKPF's vessel interception operation	2011-12	Tender invitation in progress (with tender closing date in December 2017)
4	Provision of $64 million for the replacement of eight speed craft of the HKPF which had been in service since 1997 or 1998	2011-12	Tender invitation in progress (with tender closing date in October 2017 — see item 1 of Table 6 in para. 2.24)

Table 4 (Cont'd)

Item	Vessel procurement project	Year of funding approval	Status as at 31 August 2017
5	Provision of $16 million for the replacement of two diving support speedboats of the FSD which had been in service since 2000	2012-13	Shipbuilding in progress (per contract awarded in May 2017 — see item 5 of Table 6 in para. 2.24)
6	Provision of $10 million for the procurement of one new patrol vessel of the AFCD	2012-13	Shipbuilding in progress (per contract awarded in January 2017 — see item 4 of Table 6 in para. 2.24)
7	Provision of $29.9 million (Note) for the replacement of three vessels of the MD which had been in service since 1993 or 1994	2012-13	Shipbuilding in progress (per contract awarded in March 2017 — see item 3 of Table 6 in para. 2.24)

Source: *Audit analysis of MD records*

Note: *As a result of the delay, the approved funding of 2012-13 was reallocated for other uses. New funding of $44.6 million for the project was approved in the 2016-17 Estimates.*

2.11 Audit examination of the MD's records revealed the following factors contributing to the delays in implementing vessel procurement projects:

(a) long time taken to review the marking scheme for tender assessment (see paras. 2.12 to 2.16);

(b) shortage of SoSs (see paras. 2.17 to 2.22);

(c) slow progress in outsourcing project management work to clear backlog (see paras. 2.23 to 2.27); and

(d) discrepancies in tender documents (see paras. 2.28 and 2.29).

Long time taken to review the marking scheme for tender assessment

2.12 It had been the practice of the MD to use a marking scheme for assessing tenders of a vessel procurement project with value exceeding $1.43 million. In approving the award of a contract for vessel procurement in December 2009, the Central Tender Board (CTB) noted a provision in the tender evaluation sheet that the MD would exercise discretion to accept a tender which did not provide sufficient information for assessment under the Marking Stage. While the MD explained the circumstances under which such discretion would be exercised, the CTB was concerned that the arrangement was not made known to tenderers (as the tender evaluation sheet was an internal document). The CTB requested the MD to refine the relevant provision of the marking scheme in consultation with the Department of Justice (DoJ).

2.13 ***Projects postponed during the review.*** The GNCS was tasked to follow up on the review of the marking scheme. It took 10 months (from December 2009 to mid-October 2010) to draft a revised marking scheme for the HKPF's procurement project of 11 speed craft. During the period from October 2010 to April 2011, the GNCS sought a few rounds of comments on the marking scheme from the DoJ. In the course of consulting the DoJ, the GNCS pointed out that the revised marking scheme was intended to be used for all types of vessels. From May 2011 onwards, the GNCS continued to consult relevant parties (i.e. the HKPF, Financial Services and the Treasury Bureau (FSTB), CTB and DoJ) over different time periods and revise the marking scheme in light of their comments. In April 2012, the FSTB commented that a standard marking scheme for all types of vessels would be complicated and inappropriate given the variation of vessels' main characteristics. The GNCS was advised to submit the marking scheme representing the specific vessel type for approval. In October 2012, the CTB approved the revised marking scheme for the HKPF's speed craft procurement project (see Appendix C for a chronology of

events of the tender marking scheme review). During the almost three-year period (from December 2009 to October 2012), 9 projects (Note 17) for the procurement of 29 vessels (including items 1 to 3 of Table 3 in para. 2.9 and items 1 to 4 of Table 4 in para. 2.10) with total approved funding of $263.7 million were postponed for periods ranging from 4 months to 2.8 years.

2.14 Audit examined the MD's records to ascertain how the progress of the GNCS's work on revising the marking scheme had been monitored by the MD's management. Audit found that the GNCS started reporting the progress to the Government Dockyard weekly management meeting (which was chaired by the Assistant Director of the GFD) in August 2010. In September 2010, the GNCS reported that the revised marking scheme was expected to be approved by the CTB in February 2011. While the expected approval date of the revised marking scheme was subsequently not met, there was no record showing reporting/discussion at the management meetings on the likely impact (e.g. the number of procurement projects affected and the extent of delays) and any possible measures to mitigate the impact (such as reassessing the need for using marking schemes for the pending procurement projects). According to the SPRs, departments may consider the use of a marking scheme for tender evaluation where the quality of the service/product to be procured is of paramount importance. In this connection, Audit noted that in December 2010, the DoJ suggested that the MD should review the need for using a marking scheme. There was no record to show that the MD had responded to DoJ's suggestion. In the event, the GNCS conducted a tendering exercise for the procurement of 3 lighters without the use of a marking scheme in December 2012. The GNCS only used marking schemes for 3 projects after the CTB's approval of 2012, i.e. the 11 speed craft project of the HKPF (see para. 2.13), and two projects for other types of vessels after obtaining the GLD Tender Board's approval for the relevant marking schemes in 2014 (see Note 7 to para. 1.7(b)). In August 2014, the FSTB issued a circular

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Note 17: *According to a "Report of review of manpower of GNCS" finalised by the MD in May 2013, since the review of the tender marking scheme in December 2009, all new vessel procurement projects that required a marking scheme had been postponed until 3 October 2012 (the date of the CTB's approval of the revised marking scheme). Up to 19 April 2013, there were a total of 13 outstanding projects (see para. 2.23) for 37 vessels, including 4 projects (for a total of 8 vessels) with funding approval between 4 October 2012 and 19 April 2013. In other words, 9 (13 less 4) projects for 29 (37 less 8) vessels were postponed until 3 October 2012 because of the review of the tender marking scheme. As at 31 August 2017, 2 of the 9 delayed projects had been completed.*

reminding bureaux/departments to avoid excessive use of marking scheme for tender assessment.

2.15 Audit also requested the MD to provide records of its senior management's monitoring of the GNCS's work on reviewing the marking scheme from 2010 to 2012, such as the Corporate Team Weekly Meeting which was attended by directorate officers of the MD. However, the MD informed Audit in August 2017 that no minutes of the Corporate Team meetings had been kept during the said period. As such, Audit was unable to ascertain whether the MD's senior management had been timeously informed of the delay in nine vessel procurement projects (see para. 2.13) caused by the long time taken in reviewing the marking scheme and had given any direction to the GNCS in this regard. In September 2017, the MD informed Audit that the situation had been improved since May 2014. Written notes of the Corporate Team meetings were prepared to record the deliberations of the meetings. Besides, to strengthen the management oversight of the GFD, the Director of Marine and Deputy Director of Marine (Special Duties) had attended the Government Dockyard management meetings since February 2016 on a regular basis.

2.16 Audit notes the MD's recent efforts to improve the documentation of important meetings and to strengthen the management oversight of the GFD's work. In Audit's view, the MD needs to sustain these improvement measures taken to ensure the timely delivery of vessel procurement projects.

Shortage of SoSs

2.17 ***Recruitment difficulties.*** The SoSs in the GNCS play an important role in the procurement of government vessels. They act as the marine engineer and naval architect for the MD on the construction of new vessels (Note 18). The MD has been experiencing difficulties in recruiting SoSs to fill the vacancies in the department. Since the lifting of the civil service recruitment freeze in 2007, the MD conducted

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Note 18: *Main duties and responsibilities of SoSs in the GNCS include: (a) conducting feasibility studies of user operational requirements, advising user departments on technical and cost issues, and preparing SCOGC papers, specifications and tender documents; (b) evaluating tenders and making recommendations; (c) supervising design and construction of new vessels; (d) accepting vessels upon their delivery; and (e) liaising with user departments regarding modification of existing vessels.*

8 open recruitment exercises for SoS posts up to 2012. The number of SoSs successfully recruited in each exercise averaged 2.5 whereas the target numbers of recruits ranged from 2 to 9.

2.18 According to the "Final Report of the Steering Committee on Systemic Reform of the Marine Department" published in April 2016 (see para. 1.13), the supply of home-grown trained seafarers had always been very limited because there was a general lack of interest amongst young people to work on board ocean-going vessels. Besides, the maritime industry was a highly global business and shipping companies in the private sector were more flexible to address their manpower problems by offering a competitive remuneration package and recruiting employees from all over the world. Moreover, the professional qualifications required for entry to the SoS grade tended to be stringent (Note 19) which also led to the manpower shortage and succession problems (Note 20) in the MD.

2.19 ***Stop-gap measures.*** Five recruitment exercises of SoSs had been conducted between 2013 and January 2017. The MD had implemented some stop-gap measures in the recruitment exercises conducted since 2014, including: (a) relaxation of requirements on language proficiency and working experience; (b) granting of incremental credit for working experience; and (c) enhancing the publicity of the recruitment exercises. However, the average number of SoSs successfully recruited in each exercise was only 3.2 whereas the target numbers of recruits ranged from 7 to 10. For the GNCS, the MD obtained approval in September 2013 to create three time-limited SoS posts for the period from 2014-15 to 2017-18 to speed up the clearance of vessel procurement project backlog accumulated from December 2009 to 2013 (see para. 2.13). In November 2016, the MD obtained further time-limited resources for creation of one Senior SoS and two Assistant Ship Inspectors for five years from 2017-18 to 2021-22 to further speed up the clearance of the procurement backlog.

Note 19: *At the entry rank, candidates for the SoS grade must possess a relevant degree (e.g. in mechanical/marine engineering or nautical studies) and must have worked on board ocean-going vessels at designated responsible positions for the required length of sea service or accumulated relevant experience in the naval architectural field.*

Note 20: *For example, the average age of the new intakes for the recruitment exercises from 2007 to 2012 was 44.3 at the time of appointment.*

2.20 ***Manpower situation.*** Notwithstanding the implementation of the stop-gap measures, the number of vacancies in the SoS grade in the MD continued to increase from 5 (i.e. 9.3% of the establishment of 54 posts) as of April 2013 to 11 (i.e. 20% of the establishment of 55 posts) as of March 2017. Over this period, the GNCS continued to carry 1 to 3 vacancies (see Table 5). In June 2013 and March 2015, the MD informed relevant user departments that there would be delays in the vessel procurement projects due to the shortage of SoS grade staff and other priorities of the department. In 2017, the Task Force on Reform of the MD (see para. 1.13) conducted a review of the workload and manpower of the GNCS and recommended extending the three time-limited SoS posts for four years until 31 March 2022.

Table 5

Staffing position of SoS grade in the GNCS

SoS grade in the GNCS	Position as at 31 March				
	2013	2014	2015	2016	2017
	(Number)				
Permanent establishment (a)	4	4	4	4	4
Time-limited post endorsed for creation (b)	0	3	3	3	4
Total (c)	4	7	7	7	8
Civil service staff (d)	3	1	2	3	5
Non-civil service contract terms staff (e)	0	4	2	3	1
Vacancy (f) = (c)−(d)−(e) (Note)	1	2	3	1	2

Source: MD records

Note: In September 2017, the MD informed Audit that in view of the shortage of suitable SoS candidates to fill the vacancies, it had redeployed resources to create one Chief Supplies Officer and one Supplies Officer posts under the Task Force on Reform starting from February 2016 to provide expert advice to the officers in the GNCS on supplies and procurement matters. In November 2016, the MD obtained further time-limited resources to extend the two Supplies Officer grade staff posts for the period from 2017-18 to 2021-22.

2.21 ***Succession problem.*** According to the Steering Committee Report, the MD was also facing critical succession problem in the SoS grade. The average age of SoS grade staff was 52.2 as at 30 April 2013 and 52.1 as at 31 March 2017. Of the 47 SoSs as at March 2016, 33 (70%) would reach the normal retirement age in ten years' time. The Steering Committee considered that the MD should continue to implement the stop-gap measures that had already been rolled out and identify more practicable stop-gap measures for recruiting suitable candidates including the option of recruiting experienced professionals to the senior ranks. As regards the succession problem of the SoS grade staff, the Steering Committee strongly supported the creation of a new training or assistant rank through embarking on a grade structure review. To follow up on the recommendations of the Steering Committee, the MD had been working with the Civil Service Bureau through the conduct of a grade structure review of the SoS and the Marine Officer grades (see para. 1.15), which was in progress as of August 2017.

2.22 In Audit's view, the MD needs to expedite the implementation of the Steering Committee's recommendations in addressing the manpower shortage and succession problems of SoS grade staff to speed up the clearance of the procurement backlog.

Slow progress in outsourcing project management work to clear backlog

2.23 With the addition of 4 new projects after the approval of the revised marking scheme in October 2012, there were a total of 13 outstanding procurement projects (see Note 17 to para. 2.13) (costing over $1.43 million each) up to April 2013. As another measure to clear the backlog of vessel procurement projects (see para. 2.19), the MD obtained funding of $35.44 million from the THB in October 2013 to engage consultants from 2014-15 to 2016-17 to manage 10 projects for the procurement of 26 vessels. The nature of consultancy services would include carrying out conceptual design and preparing technical specifications prior to the award of shipbuilding contracts, and providing management services after the award of shipbuilding contracts.

2.24 However, up to August 2017, the MD only engaged consultants to assist in the management of 6 procurement projects of 16 vessels (see Table 6):

(a) for 2 projects, the consultants were required to provide services both before and after the award of shipbuilding contracts; and

(b) for the remaining 4 projects, the consultants were required to provide services after the award of shipbuilding contracts, i.e. MD in-house staff carried out the conceptual design and prepared the technical specifications.

Table 6

Six vessel procurement projects managed by consultants (August 2017)

Project	Consultancy services		Tender invitation date for shipbuilding contract	
	Conceptual design and technical specifications	Management of shipbuilding contract	Expected	Actual
1. Replacement of eight speed craft of the HKPF (see item 4 of Table 4 in para. 2.10)	Yes	Yes (Note 1)	May 2015	April 2017 (tender closing in October 2017)
2. Replacement of a speed craft of the C&ED (see item 2 of Table 3 in para. 2.9)	Yes	Yes (Note 1)	June 2015	October 2016 (Note 2)
3. Replacement of three vessels of the MD (see item 7 of Table 4 in para. 2.10)	No	Yes	May 2015	July 2016 (contract awarded in March 2017)
4. Procurement of a patrol vessel of the AFCD (see item 6 of Table 4 in para. 2.10)	No	Yes	June 2015	January 2016 (contract awarded in January 2017)

Table 6 (Cont'd)

Project	Consultancy services		Tender invitation date for shipbuilding contract	
	Conceptual design and technical specifications	Management of shipbuilding contract	Expected	Actual
5. Replacement of two diving support speedboats of the FSD (see item 5 of Table 4 in para. 2.10)	No	Yes	June 2015	September 2016 (contract awarded in May 2017)
6. Replacement of a vessel of the Correctional Services Department (see item 1 of Table 3 in para. 2.9)	No	Yes	June 2015	December 2016 (contract awarded in August 2017)

Source: *Audit analysis of MD records*

Note 1: *According to the MD, the consultancy service contracts for the management of shipbuilding contracts for the HKPF and C&ED were expected to be awarded in August 2018 and October 2017 respectively.*

Note 2: *According to the MD, the shipbuilding contract was awarded on 10 October 2017.*

Remarks: *As at August 2017, the status of the four procurement projects for which consultants had not been engaged was as follows: (a) for three projects, tender exercises for shipbuilding contracts had been arranged including one with contract to be awarded shortly, one under tender evaluation stage, and one pending tender closing; and (b) for the remaining project, invitation of tenders for the shipbuilding contract was pending the HKPF's advice on the tender approach.*

2.25 According to the funding submission to the THB of 2013, the MD expected that with the outsourcing arrangement, tenders for the 6 shipbuilding contracts would

be invited in May or June 2015. However, as shown in Table 6, the expected tender invitation dates were not met in all six contracts, i.e. seven months to 2 years behind schedule.

2.26 For the two projects which the consultants were responsible for the conceptual design and technical specifications (see items 1 and 2 of Table 6), tenders for the consultancy services were invited in May 2015, about 10 months later than the expected tender invitation date of August 2014 as stated in the funding submission to the THB. In February 2016, the HKPF (one of the user departments) informed the MD of the following inadequacies of the consultancy services it received:

(a) the tender specification prepared by the consultant for the eight speed craft resembled the features of the petrol craft in an earlier procurement exercise and it included features not required by the HKPF;

(b) the consultant did not have technical staff stationed in Hong Kong to facilitate discussion; and

(c) the consultancy service could not speed up the vessel procurement process.

In September and October 2017, the MD informed Audit that the outsourced project mentioned above was the first pilot project and with the experience gained, the ensuing outsourced projects were able to achieve the intended purpose in an effective manner.

2.27 Up to August 2017, of the backlog of 13 procurement projects with funding approval obtained before April 2013 (see para. 2.23), only 3 projects had been completed. Of the 10 outstanding projects (see items 1 to 3 in Table 3 of para. 2.9 and all seven items in Table 4 of para. 2.10), 5 were still in the tender stage. Audit considers that the MD needs to expedite action to clear the backlog. In this connection, the MD needs to speed up the outsourcing of project management work to consultants.

Discrepancies in tender documents

2.28 In examining a delayed vessel procurement project of the MD (see item 2 of Table 4 in para. 2.10), Audit noted that the delay was partly attributable to the discrepancies found in the tender documents (see Case 1 for details).

Case 1

Project delay due to discrepancies found in tender documents

1. In 2011-12, the MD obtained funding of $9.7 million for replacing an aged vessel which had been in service since 1995. Due to the need to review the marking scheme (see paras. 2.12 and 2.13) and the shortage of SoSs (see paras. 2.17 to 2.20), tender preparation for the project was deferred until December 2015.

2. ***Discrepancies found.*** Tenders for the procurement contract were invited in March 2016 and a tender notice was gazetted on the same day. Upon close of tender in May 2016, five offers were received. During the tender evaluation process in August 2016, the GNCS found that there were discrepancies between the tender notice and the tender document in relation to the overall length and breadth of the vessel (e.g. the overall length was specified as not less than 15 metres (m) in the tender notice but as 14 to 15 m in the mandatory requirements of the tender document).

3. In September 2016, the MD sought legal advice from the DoJ on whether it could award a contract to a tenderer which conformed with the length requirement in the tender document but not the gazetted tender notice. In October 2016, the MD noted that a tenderer must conform to the essential requirements as set out in the tender notice and the tender document in order to be awarded the contract.

4. ***Cancellation of tender.*** In December 2016, the MD sought approval from the GLD Tender Board for cancellation of the tender. While granting the approval, the Board was of the view that the cancellation could have been avoided had the MD exercised due diligence in the preparation of the tender notice and the tender document. In April 2017, the procurement contract was re-tendered with the tender closing date in July 2017, i.e. the project was delayed by one year compared with the first tender closing date of May 2016.

Source: MD records

2.29 In light of the findings in Case 1, Audit examined another MD's vessel procurement project which was completed in March 2017 (see Case 2). Audit found that there was similar problem of discrepancies in the tender documents. Although the progress of the project had not been affected as a result, the recurrence of similar discrepancies is a cause of concern. There is a need for the MD to step up the checking of the accuracy and consistency of tender documents.

Case 2

Another project with discrepancies found in tender documents

1. In November 2013, the MD obtained funding of $12 million for replacing two patrol vessels which had been in service since June 1994 and March 1996 respectively, i.e. they had been operating beyond the expected lifespan of 15 years.

2. ***Discrepancies found.*** Tenders for the supply of the two vessels were invited in July 2014 and a tender notice was gazetted on the same day. Prior to the close of tender in October 2014, a shipbuilding company found several discrepancies within the tender document in relation to the specifications of the hull of the vessels, their breadth and number of seats (e.g. the General Technical Requirements stated that the maximum breadth of the vessel was 2.4 m whereas the General Essential Requirements stated that the required breadth was not more than 4.2 m) and sought clarification from the GNCS in September 2014. After advising the shipbuilding company, the GNCS also revised the tender document posted on the MD's website. However, the Gazette Notice was not revised. The tender was closed in October 2014 but no offer was received. The procurement contract was re-tendered in August 2015. The contract was subsequently awarded in March 2016 and the vessels were delivered in March 2017.

Source: MD records

Delay in implementing a vessel procurement project due to change of shipbuilding contractor

2.30 In 2005, the FC approved funding of $60 million for the HKPF to procure 23 divisional fast patrol craft as part of its versatile maritime policing response. According to the FC paper, the expected commissioning dates would be March 2008 for 17 vessels and March 2009 for the remaining 6 vessels. In December 2006, the MD on behalf of the HKPF awarded a contract for the procurement of the 23 vessels by 4 batches at a total sum of $37.2 million to a shipbuilding contractor (Contractor A). The order of the second, third and fourth batches would be individually subject to the successful performance of the previous batch of vessels at the end of a 2-month trial period after vessel delivery and acceptance.

2.31 The first two batches of 6 vessels each were delivered in December 2007 and November 2009 respectively. However, due to a contractual dispute between the MD and Contractor A, the MD decided not to order the last two batches of vessels under the 2006 contract but awarded a new contract for the procurement of the remaining 11 vessels to another contractor in 2013. The 11 vessels were subsequently delivered in February 2016. In the event, the expected commissioning dates as stated in the FC paper (see para. 2.30) were not met for 17 (6 plus 11) vessels.

2.32 The contractual dispute between the MD and Contractor A is yet to be resolved. In order not to prejudice the ongoing dispute resolution process, Audit does not make any comment in relation thereto in this Audit Report.

Frequent machine failure of two new vessels

2.33 In November 2012, the MD obtained funding of $11 million for the replacement of two of its patrol launches. In March 2014, a shipbuilding contract was awarded at a sum of $9.54 million to a contractor (Contractor B). The two vessels were delivered in February 2015 and formally accepted by the MD after completion of the necessary acceptance tests (e.g. the official sea trial). During the warranty period from February 2015 to February 2016, the following defects were found in one of the two new patrol launches:

(a) abnormal shutdown of the generator set;

(b) frequent shutdowns of the outboard engines; and

(c) defects in relation to the radar, navigation light and alarm.

2.34 By the time of expiry of the warranty period in February 2016, the problem of the generator set had not been fixed. According to Contractor B, it was still waiting for the delivery of the spare parts as the workers of the spare part supplier were on

strike in November and December of 2015 (Note 21). After completion of the repair work for the generator set in April 2016, the defects in relation to the radar, navigation light and alarm recurred. The defects were only rectified in November 2016 and March 2017.

2.35 As a result of repair works for the abovementioned defects, the downtime of the patrol launch from February 2015 to March 2017 recorded in the Government Dockyard was 126 days. In addition, the launch also underwent repair at Contractor B's shipyard from February to April 2016 which caused a downtime of 70 days. The total downtime of 196 days (27% of a 2-year period) appears excessive for a new vessel. As for the second patrol launch which also experienced problems with its generator set and one of its outboard engines mainly after the warranty period, its downtime was 22.5 days during the warranty period and 103 days in the year immediately after the warranty period. Up to August 2017, there was no record to show that the MD had conducted a review on the excessive downtime of the two new vessels. In Audit's view, the MD needs to carry out a review in this regard with a view to preventing recurrence of similar problems.

Audit recommendations

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

(a) **improve the overall planning for the procurement of new and replacement government vessels, including:**

(i) **expediting action to complete the review of GFD Circular No. 10/2008 regarding its requirement on compiling a five-year rolling plan; and**

(ii) **closely monitoring the safety of aged vessels by conducting condition assessments in a timely manner and in consultation with user departments, taking prompt follow-up actions on the assessment results;**

Note 21: *The MD informed Audit in August 2017 that the GNCS had obtained from Contractor B limited warranty for the generator set for three additional months from May to August 2016.*

(b) **sustain the improvement measures taken in monitoring the GFD's work to ensure the timely delivery of vessel procurement projects;**

(c) **expedite action to clear the backlog of vessel procurement projects (see para. 2.27), including:**

(i) **implementing the Steering Committee's recommendations in addressing the manpower shortage and succession problems of SoS grade staff; and**

(ii) **speeding up the outsourcing of project management work to consultants;**

(d) **step up the checking of the accuracy and consistency of tender documents; and**

(e) **carry out a review on the long downtime of the two new vessels delivered in February 2015 (see paras. 2.33 to 2.35) with a view to preventing recurrence of similar problems.**

Response from the Government

2.37 The Director of Marine agrees with the audit recommendations. She has said that:

(a) the MD has strengthened the governance of the GNCS and rolled out a series of measures to speed up vessel procurement projects since December 2015. For example, the MD has deployed Supplies Officer grade staff to provide expert advice to the GNCS, provided extra professional grade staff to expedite the clearance of the procurement backlog, and commenced the conduct of the grade structure review for the two professional grades to address the recruitment and succession problems in the long run; and

(b) looking forward, the MD will sustain its effort to provide professional support to government departments for the procurement of new vessels.

PART 3: MAINTENANCE OF GOVERNMENT VESSELS

3.1 This PART examines the MD's work on the maintenance of government vessels, focusing on:

(a) availability of government vessels to users (paras. 3.3 to 3.6);

(b) management of downtime of government vessels (paras. 3.7 to 3.13); and

(c) management of maintenance contracts (paras. 3.14 to 3.25).

Organisation of vessel maintenance work

3.2 According to its Controlling Officer's Report (COR), the MD aims to provide cost-effective maintenance services to the user departments. The MS (see para. 1.9) of the MD is headed by a Senior Maintenance Manager and comprises three maintenance teams. While preventive service (see para. 1.10(b)) is performed regularly in the Government Dockyard, running repair (see para. 1.10(c)) is carried out as and when necessary both inside and outside the Government Dockyard. The MD has outsourced some 90% of the vessel maintenance work. According to the MD, the remaining in-house maintenance work relating to workshop services and urgent minor repairs is carried out by Works Supervisor, Senior Artisan and Artisan grades staff, totalling 65 as at March 2017 (Note 22). Among them, 50 worked in the Government Dockyard, i.e. 47 in ten specialised workshops and three performed urgent repair work. The remaining 15 staff provided repair services at five regional forward bases of the Marine Police (Note 23).

Note 22: *Of the MS's establishment of 70 Works Supervisor, Senior Artisan and Artisan grades staff, 65 were deployed to carry out in-house maintenance work while the remaining 5 were responsible for monitoring outsourced maintenance work.*

Note 23: *The five regional forward bases of the Marine Police are located in Sai Kung, Tai Lam Chung, Ma Liu Shui, Sai Wan Ho and Aberdeen.*

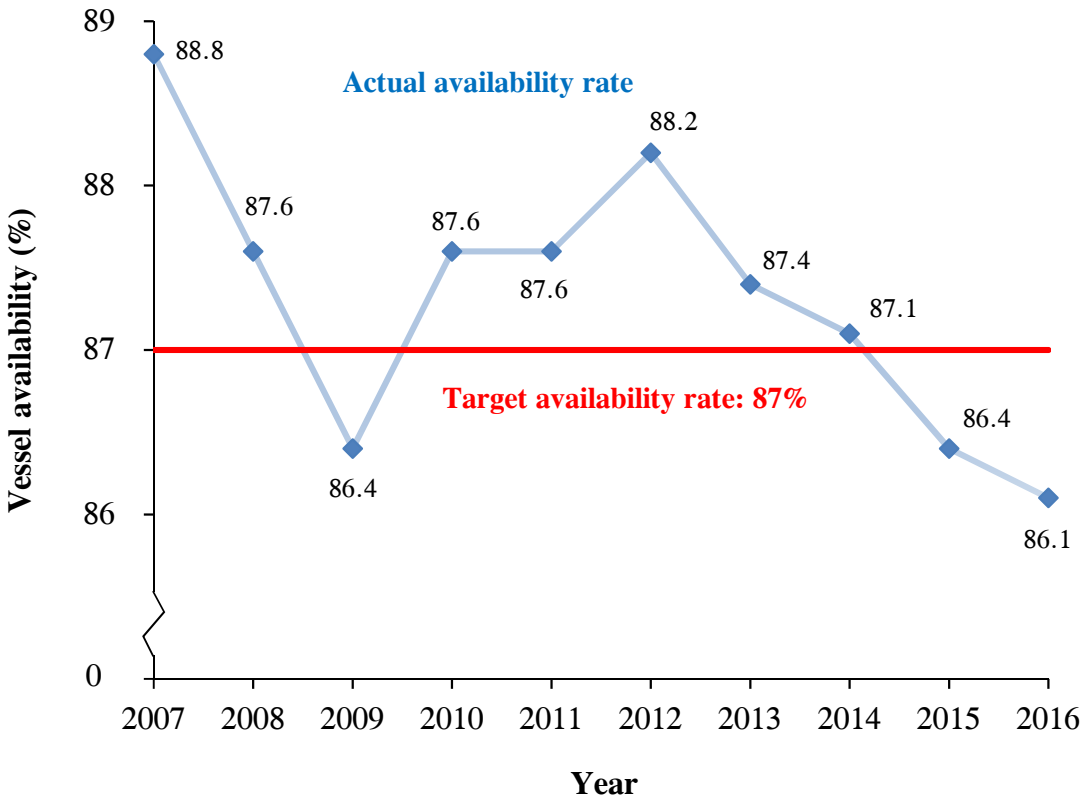
Availability of government vessels to users

Vessel availability rate on a decreasing trend

3.3 The MD's work on the maintenance of government vessels is important to support the work of various user departments, especially the disciplined services departments in carrying out law enforcement and emergency duties. The MD has set a performance target at 87% in its COR to monitor vessel availability to all users. As shown in Figure 2, the availability rates of government vessels as reported by the MD decreased from 88.8% in 2007 to 86.1% in 2016. For three years in 2009, 2015 and 2016, the availability rates were below the target of 87%, ranging from 86.1% to 86.4%.

Figure 2

Availability rates of government vessels (2007 to 2016)



Source: MD records

3.4 Audit noted that the MD had also reported in an annual report entitled "Port of Hong Kong Statistical Tables" the availability rates of MECVs and HSCLs (see para. 2.3) of user departments. The reported availability rates of these two classes of vessels for six major user departments from 2012 to 2016 are summarised in Table 7. It can be seen that the target availability rate was not met in three years for both the HKPF and ImmD and in two years for the AFCD and the MD. The decreasing vessel availability rates for user departments in general, and non-attainment of the target vessel availability rate for the HKPF and ImmD (Note 24) in particular warrant the MD's attention as their operational efficiency could be adversely affected.

Table 7

Availability rates of MECVs and HSCLs for six major user departments (2012 to 2016)

Year	User department					
	HKPF	**MD**	**FSD**	**AFCD**	**C&ED**	**ImmD**
2012	87.1%	89.7%	88.0%	90.6%	88.9%	85.9%
2013	87.0%	86.9%	89.2%	90.0%	88.5%	85.8%
2014	85.6%	86.6%	88.1%	93.8%	88.5%	88.4%
2015	84.0% (Note)	88.9%	87.1%	85.3%	87.4%	86.8%
2016	84.8% (Note)	87.9%	83.9% (Note)	82.2% (Note)	87.4%	87.0%

Source: *MD records*

Note: *In October 2017, the MD informed Audit that the low availability rates for the three user departments' vessels were partly due to the downtime for running repairs as a result of accidents (i.e. 291 days in 2015 and 206 days in 2016 for the HKPF, 176 days for the FSD and 30 days for the AFCD). However, based on information provided by the MD, with the exception of the FSD, the target availability rate of 87% was still not met for the HKPF and AFCD in 2015 and/or 2016 after excluding the downtime due to accidents in calculating the actual availability rates.*

Remarks: *Shaded figures represent availability rates below the target of 87%.*

Note 24: *In September 2017, the MD informed Audit that the availability rate was affected by the unique fleet operating profile of these two user departments.*

Inadequacies in reporting vessel availability rates

3.5 ***Not all classes of vessels covered in reporting availability rates.*** While the MD stated in its COR that the target vessel availability rate was set for all users, Audit found that the reported availability rates in fact only covered MECVs and HSCLs, two of the four major classes of vessels (see para. 2.3). For 3 of the 14 user departments which did not have any MECV and HSCL (see Appendix B), the reported vessel availability rates did not reflect their situation. For 6 of the 14 user departments, their MIMCs and/or HSCMs totalling 80 vessels were not covered in the reported vessel availability rates. The current practice of reporting the vessel availability rates without any explanatory note may cause misunderstanding to users of the COR. The MD needs to make improvement in this regard.

3.6 ***Methodology in calculating vessel availability rates not explained in CORs.*** According to the MD, the vessel availability rate was calculated using the following formula:

$$\frac{\begin{array}{c}(365 \text{ days} \times \text{number of MECVs and HSCLs} - \text{total downtime (days)} \\ \text{for maintenance and repair of MECVs and HSCLs in a year})\end{array}}{(365 \text{ days} \times \text{number of MECVs and HSCLs})} \times 100\%$$

According to the MD's quality manual of 2016 provided to Audit on 28 July 2017 (see an extract at Appendix D), the downtime for carrying out maintenance and repair both inside and outside the Government Dockyard would be recorded for working out the vessel availability rates. However, Audit's sample check of the Arrival and Completion Form (A&C Form — Note 25) used by the MD for recording the downtime revealed that the downtime for repair carried out outside the Government Dockyard (including those carried out in the five regional forward bases of the Marine Police — see Note 23 to para. 3.2) was not always recorded. Upon enquiry, the MD provided Audit in August 2017 with an internal circular of 2012 and an updated quality manual of 2017 which stated that only the downtime for carrying out

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Note 25: *An A&C Form is used by the MD to record the arrival time of a vessel at the Government Dockyard for maintenance/repair services and the completion time of the related work which can also serve as a log sheet for recording the vessel downtime for maintenance/repair services. Audit sample checked 40 A&C Forms of November 2016 used for recording repair work outside the Government Dockyard and found that only 9 had recorded both the date and time of commencing and completion of the repair work.*

maintenance and repair inside the Government Dockyard would be taken into account in calculating the vessel availability rate. In response to Audit's further enquiry, the MD in August and October 2017 said that:

(a) excluding the downtime of maintenance and repair outside the Government Dockyard had been the established practice for long even though this might not have been set out clearly in the former issues of the manual;

(b) the reason for excluding the downtime outside the Government Dockyard was that the vessels were still under the control and operation of the user departments; and

(c) the quality manual was revised on 16 August 2017. According to the 2017 quality manual, there was no requirement to record downtime for repair outside the Government Dockyard.

However, Audit noted that some of the repair work outside the Government Dockyard was related to deferred maintenance which was beyond the control of user departments, i.e. a vessel could be released from the Government Dockyard before the completion of some maintenance/repair work (e.g. pending the arrival of components) which would be followed up outside the Government Dockyard after arrival of the components. Moreover, from the users' point of view, vessels under maintenance/repair are not available for their use irrespective of where the maintenance/repair services are rendered. Audit also noted that the basis of reporting the performance of the MD's maintenance services had not been explained in the CORs for information of relevant stakeholders. In Audit's view, the MD needs to consult relevant stakeholders (including user departments and the THB) on the current practice of calculating the vessel availability rates without taking into account the downtime for repair outside the Government Dockyard and provide appropriate explanatory note in the COR if it is decided after the consultation to continue with such practice.

Management of downtime of government vessels

3.7 The downtime of government vessels as recorded in the A&C Forms (see Note 25 to para. 3.6) is inputted into the GFIS for generation of a monthly vessel availability report for management information. Based on the GFIS records and

information provided by the MD, Audit analysed the downtime of four major classes of government vessels from 2012 to 2016. The results are summarised in Table 8.

Table 8

Downtime of four major classes of government vessels (2012 to 2016)

Year	Downtime (Number of days)			Number of vessels at year end
	For preventive service (a)	For running repair (b)	Total (a) + (b)	
2012	4,190 (64%)	2,393 (36%)	6,583 (100%)	183
2013	4,014 (50%)	3,967 (50%)	7,981 (100%)	182
2014	4,022 (50%)	3,966 (50%)	7,988 (100%)	183
2015	4,182 (54%)	3,565 (46%)	7,747 (100%)	183
2016	4,518 (55%)	3,683 (45%)	8,201 (100%)	187
Increase from 2012 to 2016 (%)	7.8%	53.9%	24.6%	2.2%

Source: Audit analysis of MD records

3.8 As shown in Table 8, while the total number of vessels increased by 2.2% from 2012 to 2016, the total downtime increased by 24.6%. The average downtime per vessel had increased from 36 (6,583 ÷ 183) days in 2012 by 22% to 44 (8,201 ÷ 187) days in 2016. The increase in total downtime is mainly attributable to the increase in running repair of 53.9% whereas preventive service only increased by 7.8% over the same period.

3.9 In response to Audit's enquiry, in August 2017 the MD said that:

(a) the main reason for the increase in downtime was the ageing problem of the government vessels. Their operating parts required extensive maintenance and even replacement. However, spare parts required might not be available. The lead time in awaiting delivery of such parts would cause additional downtime. Similarly, some machines and control systems on board the vessels might have been phased out over the years. Modification of the systems would have to be studied; and

(b) with a view to counteracting the ageing effect of the vessels, such as maintaining their service speed, preventive service had been enhanced which also caused extra downtime.

Audit understands that the increase in downtime has to be seen in the context of an ageing government fleet. However, the MD needs to critically examine if there were other factors contributing to the increase in downtime. In this connection, Audit found that there was room for improvement in managing the preventive service and running repair work as illustrated in paragraphs 3.10 to 3.13.

Preventive maintenance scheduling

3.10 Every 12 to 18 months, some 100 vessels will dock at the Government Dockyard for preventive service. Due to the limited dry-docking spaces (only 10 ship repairing sheds for the large mechanised vessels to carry out superstructure repair and/or painting work) and other docking facilities, the MD has to schedule the maintenance work to ensure the smooth operation of the Government Dockyard. If preventive service is properly planned, the downtime waiting for docking resources can be minimised. At the beginning of each year, the MD provides a maintenance schedule to each user department showing the start date and proposed working days required for preventive service (i.e. the budgeted downtime) of each of the specified vessels in the schedule. The scope of maintenance work is drawn up based on the defect list provided by the user department and the maintenance staff's pre-docking inspections (see para. 1.10(a)) of the vessels concerned.

3.11 According to the MD's quality manual, the progress of the maintenance service is closely monitored to minimise downtime by re-allocating docking resources. Based on the progress status of those vessels under maintenance, the number of vessels

returning to the Government Dockyard for preventive service in the next quarter or their scheduled docking dates may be adjusted (e.g. user departments' requests for suiting their operational needs). If more time is spent on the scheduled maintenance than budgeted, the extra downtime and the underlying reasons will be recorded and inputted into the GFIS. Upon Audit's request, the MD provided an analysis of the extra downtime for preventive service of four major classes of vessels from 2012 to 2016 (see Table 9).

Table 9

Analysis of extra downtime for preventive service of four major classes of vessels (2012 to 2016)

Major reason	Extra downtime (Number of days)				
	2012	2013	2014	2015	2016
Extra work not covered in service contract	13	20	77	102	183
Waiting for spare parts	3	46	64	38	95
Bad weather	15	17	11	11	44
Interference of dockyard facilities/unavailability of dry-berth	3	6	3	7	37
Crew staff for dock & sea trial not available (including crew of user departments)	13	9	10	9	36
Dock/sea-trial defect	7	13	16	1	26
Slow work progress of contractor	1	6	8	13	4
Others (Note)	–	17	37	15	32
Total	55	134	226	196	457
Budgeted downtime	3,987	3,384	3,070	2,448	3,590

Source: *MD records*

Note: *Examples were extra days for dimension measurements, remedial hull painting work, and material warranty claims to suppliers.*

Remarks: *Vessels with preventive services completed within the budgeted downtime were excluded from the above analysis.*

3.12 ***Need to minimise extra downtime.*** Extra downtime is disruptive to the normal operation of the user departments and should be minimised as far as possible. As shown in Table 9, the total extra downtime increased by sevenfold from 55 days in 2012 to 457 days in 2016. The MD needs to look into the contributing factors to see whether there is room for improvement. In this connection, Audit has the following observations:

(a) ***Extra work not covered in service contract (183 days).*** This has caused delays to the maintenance work of 32 vessels by 1 to 17 days each (averaging 5.7 days) in 2016. As the scope of maintenance in the contracts is determined by the MS based on the defect lists provided by the user departments and the pre-docking inspections of the vessels (see para. 1.10(a)), the increase in downtime due to extra work suggests that there may be room for improvement in conducting vessel inspection. Audit understands that some defects may be found after a vessel is opened up for inspection during preventive service. However, extra work after the award of a contract may entail a contract variation (with possible time and cost implications) which should be kept to a minimum wherever practicable;

(b) ***Waiting for spare parts (95 days).*** A total of 13 vessels were delayed for this reason by 1 to 24 days each (averaging 7.3 days). There is a need to review the adequacy of spare parts planning and management;

(c) ***Interference of dockyard facilities/unavailability of dry-berth (37 days).*** This has caused delays to 9 vessels by 1 to 9 days each (averaging 4.1 days). The situation calls for a review of the scheduling arrangements; and

(d) ***Crew staff for dock and sea trial not available (36 days).*** A total of 17 vessels were delayed by 1 to 7 days each (averaging 2.1 days). Audit understands that there might be times when some trials could not be conducted due to public holidays and unavailability of crew staff of user departments who might be deployed for emergency duties. However, for those cases with long delay, the MD needs to explore ways to improve the coordination between the crew staff and maintenance staff.

Running repair

3.13 Running repair of vessels due to accident, damage, machinery breakdown or malfunctioning is carried out as and when required. The MD has put in place procedures for monitoring the downtime for running repair, i.e. requiring the maintenance teams to provide monthly progress reports to the Senior Maintenance Manager of the MS for running repair jobs exceeding 3 months. However, apart from monitoring the downtime, there is also a need to review those running repair cases occurring shortly after preventive service to see if there are lessons to be learnt. Based on the GFIS records as at 25 July 2017, there were five running repair cases (each lasting 5 days or more) occurring within about 3 months of preventive service. Case 3 is a case in point.

Case 3

Flooding of a high-speed craft of the HKPF shortly after preventive service

1. On 30 June 2017, a high-speed craft of the HKPF berthed at one of its operational bases was found to have sustained serious flooding of the engine, battery, steering and cockpit compartments with the stern of the craft submerged. The craft was subsequently towed back to the Government Dockyard for inspection and repair. In September 2017, the MD sent a copy of its initial investigation report to the HKPF for comments.

Audit comments

2. According to the MD's records, the flooded craft had been in service since 2004. It had undergone preventive service at the Government Dockyard in the past three years (from 2015 to 2017). The latest preventive service lasted for 36.75 days (from 27 March to 2 May 2017). In other words, the flooding incident occurred in about 2 months after the preventive service which was an unusual case requiring further investigation. The MD, in collaboration with the HKPF, needs to complete the investigation as soon as possible to see whether there are lessons to be learnt for preventing recurrence of similar problem.

Source: MD and HKPF records

Management of maintenance contracts

3.14 The MD has maintained a list of two groups of pre-approved maintenance service providers for invitation of tenders/quotations for its maintenance jobs, one group for job value up to $50,000 and the other group for jobs of any value. For admission into the MD's pre-approved maintenance service provider list, a service provider: (a) must be a practising shipbuilder or ship repairer with a pre-requisite number of years of experience in the business; (b) must have adequate machines and tools for the relevant trades; (c) must have supervisors in the relevant trades to be based at the Government Dockyard; and (d) must have sufficient number of directly employed qualified technicians in the related trades. As of August 2017, the MD had 45 pre-approved maintenance service providers in six trades (e.g. engine repair).

3.15 The MD lets out its maintenance contracts on the following basis:

(a) ***Term contracts.*** Term contracts are awarded to maintenance contractors for providing specific types of maintenance service (e.g. engine maintenance) over a contract period of one to two years. During the contract period, the contractors are required to provide the services as and when required, and at the contract rates; and

(b) ***One-off contracts.*** For one-off contracts, the MD has to invite tenders/quotations each time a maintenance service is required. A one-off contract may be used for providing preventive service of a particular vessel or small-scale urgent repair service.

3.16 The number of maintenance contracts and estimated contract values for the past five financial years (2012-13 to 2016-17) are shown in Table 10.

Table 10

Number of maintenance contracts and estimated contract values (2012-13 to 2016-17)

Financial Year	Term contract			One-off contract			Total
	(No.)	($ million)	(%)	(No.)	($ million)	(%)	($ million)
2012-13	32	24.1	28%	3,301	63.2	72%	87.3
2013-14	30	25.5	23%	3,582	85.0	77%	110.5
2014-15	39	28.5	26%	3,982	81.6	74%	110.1
2015-16	31	31.1	25%	3,793	94.0	75%	125.1
2016-17	33	29.1	17%	3,671	144.3 (Note)	83%	173.4

Source: MD records

Note: The increase in estimated contract value in 2016-17 was mainly due to the increase in the number of major vessels receiving preventive service, i.e. 144 in 2016 compared with 112 and 113 in 2014 and 2015 respectively.

3.17 ***Guidelines on procurement and contract management.*** According to the SPRs, it is the Government policy to procure stores and services through fair and competitive procedures. The SPRs have stipulated that:

(a) purchases of similar services should be consolidated for reducing administrative cost and obtaining discounts through bulk purchase contracts; and

(b) for procurement with limited competition in past exercises, Controlling Officers should explore measures to enhance competition and satisfy themselves that the tendering or consultants selection strategy to attract new bidders is effective.

In addition, according to "User Guide to Contract Management" issued by the Efficiency Unit, contract size is an important factor that affects the interest of potential

bidders and departments should consider bundling logically related services into a single, sizeable contract to reduce the cost of contract administration and make it more attractive to potential bidders.

Need to enhance competition in the procurement of maintenance services

3.18 In 2016-17, the MD had 33 term contracts at a total estimated contract value of $29.1 million all awarded by quotations. Among the 33 term contracts, Audit noted that 23 (70%) were each awarded to the only bidder, indicating that there had been limited competition in the procurement exercises. In July 2017, the FSTB expressed similar concern when commenting on the MD's management of one of these term contracts (see para. 3.24(b)). As invitations to bid had been sent to 15 to 31 maintenance service providers in each of these procurement exercises, there is a need to explore other measures to make the contracts more attractive to the potential bidders to enhance competition.

3.19 ***Measures taken to lengthen the duration of one-year term contracts.*** Of the 33 term contracts in 2016-17, 16 (48%) were one-year contracts (for 3 consecutive terms in 15 cases and for 2 consecutive terms in one case). According to the Efficiency Unit's report "A General Guide to Outsourcing" of 2008, "Departments should determine the optimum scope of outsourcing from the point of view of both the department and the potential service providers. Surveys of departments and service providers have identified the loss of economy, efficiency and effectiveness in letting contracts that are too small and have short contract duration". Audit noted that the MD had commenced a review of the term contracts' duration since January 2017. Up to August 2017, 21 out of 25 term contracts had been awarded with a two-year term. Among these 21 two-year term contracts, 8 were one-year contracts, 5 were 1.5-year contracts and 8 were 2-year contracts in their respective preceding terms.

3.20 ***Need to consider bundling of similar services in a single contract.*** Audit's further examination of the 16 one-year term contracts (see para. 3.19) revealed that 9 (56%) were for providing related services:

(a) 6 (37%) contracts were for the repair and maintenance of engines of police vessels/speed craft (in particular two contracts were for the maintenance of outboard engines of the same maker and other onboard equipment); and

(b) 3 (19%) contracts were for the docking and undocking of government vessels.

Audit noted that these 9 contracts were of small values, ranging from $0.49 million to $1.4 million. The MD needs to consider bundling related maintenance services into reasonably sizeable contracts to reduce the cost of contract administration and make them more attractive to potential bidders whilst minimising the risk of over-reliance on a particular bidder for the required maintenance services.

Need to enhance job order and payment control under term contracts

3.21 ***Long outstanding payments.*** According to the MD's laid-down procedures, when maintenance work is required under a term contract, the responsible inspector should issue a job order to the contractor and seek his supervisor's approval before commencement of the work. After completion of work, the responsible inspector should forward the contractor's invoice to the Administration Branch (formerly the Accounting Services Section) for vetting and processing payment. In 2014, in the course of renewing a term contract for the maintenance and repair of five HKPF vessels in 2014-15, the MD was informed by the contractor that payments totalling $1.68 million for 98 work items completed under four preceding contract terms from 2010 to 2014 were still outstanding.

3.22 The MD's subsequent investigation revealed that the incident was caused by the failure on the part of the subject inspector to submit:

(a) the relevant job orders to his supervisor for approval before asking the contractor to carry out the maintenance and repair work; and

(b) the relevant invoices received from the contractor to the Accounting Services Section for processing payment as he found that there was insufficient balance in the approved contract value to cover the payments required.

3.23 After obtaining confirmation from the HKPF that all 98 work items had been completed to its satisfaction and advice from a law enforcement agency that there was no pursuable case after its investigation of the incident, the MD sought the

FSTB's approval in May 2017 to increase the contract values of two expired term contracts for settling the relevant outstanding payments. The MD also informed the FSTB that the following measures had been introduced to enhance the management of term contracts:

(a) bi-weekly review of all term contracts would be conducted by a designated officer at Maintenance Manager rank on any work item in the GFIS without job orders to ensure issue of job orders in reasonable time;

(b) the Government Dockyard officers at Chief Technical Officer rank had been reminded to closely monitor spending under term contracts to avoid actual payment exceeding the budget sum;

(c) the GFIS was enhanced to assist the management in monitoring the actual expenditure against the relevant term contracts, e.g. an e-mail would be sent out to all staff concerned when the total commitment of a term contract had met 80% and 90% of its total contract value;

(d) a new circular was issued in April 2016 to alert all MS inspectors on the control and monitoring of vessel maintenance expenditure;

(e) all work orders without job orders in the GFIS would be brought to the attention of the MS management in every two-week interval for follow-up actions; and

(f) all invoices issued by term contractors should be submitted to the Administration, Tender and Security Services Unit of the Administration Branch centrally.

3.24 When granting approval to the MD's proposed increase in contract values in July 2017, the FSTB also advised that:

(a) in view of the severity of the problems revealed, the MD should closely monitor its procurement and payment mechanism, and implement robust measures to rectify any malpractice, so as to prevent similar incidents from occurring again; and

(b) noting that there had been limited competitions in the past procurement exercises of the subject contract, the MD should explore ways to enhance competition in future procurement exercises (see para. 3.18). In this connection, it was noted that the MD would:

(i) refine the method of estimating the amount of procurement and consult user departments in the process so that more precise projection could be drawn up as far as possible;

(ii) critically review whether it was more appropriate to use tender procedures (instead of quotation procedures — see para. 3.18) in future; and

(iii) try to consolidate similar term contracts for maintenance/repair of vessels into one single contract when opportunities arose, with an aim of achieving economies of scale.

3.25 In Audit's view, the MD needs to closely monitor the implementation of the new measures introduced (see para. 3.23) to tighten job order and payment control under maintenance term contracts.

Audit recommendations

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

(a) **closely monitor the decreasing trend in vessel availability rates and take effective measures to achieve the target rate of 87%;**

(b) **in consultation with relevant stakeholders (including user departments and the THB), explore if there are better ways to report vessel availability rates in the COR, including:**

(i) **expanding the scope of reporting to cover all four major classes of vessels;**

(ii) **reviewing the current practice of calculating the vessel availability rates without taking into account the downtime for repair outside the Government Dockyard; and**

(iii) **providing explanatory notes in the COR in case of any limitation in the scope of reporting vessel availability rates (such as classes of vessels and downtime excluded from the calculation of the reported rates);**

(c) **closely monitor the increasing trend in downtime and take effective measures to minimise the extra downtime for preventive service, such as:**

(i) **improving the pre-docking inspection of vessels to ensure all necessary maintenance and repair work requirements are incorporated in the maintenance contracts as far as possible;**

(ii) **improving material planning and management to minimise waiting time for spare parts;**

(iii) **improving the scheduling arrangement to minimise interference of dockyard facilities/unavailability of dry-berth for maintenance work; and**

(iv) **improving the coordination between the crew staff of user departments and the maintenance staff to ensure timely conduct of dock and sea trials;**

(d) **review running repair cases occurring shortly after preventive service to see whether there are lessons to be learnt (see para. 3.13);**

(e) **continue to enhance competition in the procurement exercises of vessel maintenance services, such as:**

(i) **sustaining the efforts to review the duration of one-year term contracts with a view to enhancing their viability to attract bidders; and**

(ii) **considering bundling related maintenance services into reasonably sizable contracts to reduce the cost of contract administration and make them more attractive to potential bidders where appropriate; and**

(f) **closely monitor the implementation of the new measures introduced (see para. 3.23) to tighten job order and payment control under maintenance term contracts.**

Response from the Government

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

(a) the MD will continue to seek improvement in providing maintenance services for government vessels;

(b) in consultation with relevant parties, the MD will enhance the presentation of vessel availability in the COR; and

(c) in order to further enhance competition in the procurement of vessel maintenance services, the duration of contracts will be reviewed and further bundling of contracts will be explored.

PART 4: MANAGEMENT OF MAINTENANCE MATERIALS

4.1 This PART examines the MD's management of maintenance materials, including spare parts for government vessels and the Government Dockyard's facilities. Some of the materials used/stored in the Government Dockyard are controlled under the Dangerous Goods Ordinance (Cap. 295). According to Section 3 of the Dangerous Goods Ordinance, the provisions of the Ordinance do not apply to the Government. Nevertheless, the MD is committed to minimising potential hazards and risks, and ensuring that all its staff and workers work in a safe and healthy environment.

Stock management

4.2 It is the MD's practice to provide maintenance materials for use of its in-house staff and contractors in carrying out maintenance/repair work. The Supplies Services Unit (SSU) of the Finance Section (see Appendix A) is responsible for the procurement of maintenance materials. In the past three financial years from 2014-15 to 2016-17, the MD spent, on average, $132.2 million a year on procuring maintenance materials.

4.3 Maintenance materials (including repairable items taken out from vessels which can be reused after repair) are kept in the main store, 8 minor stores and 3 container stores of the Government Dockyard. The MD uses the GFIS to maintain information about maintenance materials (e.g. part description, quantity, price and date of receipt and issue) for stock management purposes. Table 11 shows the year-end stock values of maintenance materials for the past five financial years from 2012-13 to 2016-17.

Table 11

Year-end stock values of maintenance materials (2012-13 to 2016-17)

Financial year	Stock value as at 31 March		
	Purchased and repaired item	Repairable item pending repair	Total
	($ million)		
2012-13	233.9	5.0	238.9
2013-14	218.1	9.0	227.1
2014-15	232.5	12.4	244.9
2015-16	248.9	11.9	260.8
2016-17	258.5	15.5	274.0 (Note)
Average	238.4	10.8	249.2

Source: MD records

Note: There were some 17,000 stock items as at 31 March 2017.

4.4 ***Stock management guidelines.*** To enhance stock management of the Government Dockyard, the GFD issued a circular in 2008 (currently in force) which laid down the following requirements:

(a) reviewing regularly the optimum/minimum level of spare sets of engines and major components or equipment kept in the main store of the Government Dockyard; and

(b) stepping up stock review and stocktaking exercise to identify and minimise obsolete/dormant and slow-moving items.

Need to take timely follow-up action on obsolete/dormant stocks

4.5 After a stock review in July 2013, the SSU identified 8,023 items of slow-moving stock (i.e. those without movement for over five years) with a total value of $54.6 million. In April 2015, the SSU informed relevant sections in the MD that it intended to review the 8,023 slow-moving items by phases, with the first phase covering 547 items (including 50 items with value above $50,000 each). In January 2017, the Assistant Director of the GFD raised concern (after his visit to the Government Dockyard storehouse) that some spare parts were very old, broken and unserviceable. The SSU then suggested that the MS should assign an experienced inspector to conduct a joint inspection on the slow-moving stock items. In its e-mail to the MS of January 2017, the SSU said that while new spare parts were procured for future maintenance of new vessels, outdated spare parts were not always disposed of together with the replaced vessels (Note 26). As a result, more and more spare parts had been accumulated but the storage spaces could not be expanded to accommodate more spare parts in a short time.

4.6 ***Audit examination.*** For a comparison of the current position of slow-moving stock with that in 2013 (see para. 4.5), Audit requested the MD to extract relevant information from the GFIS for analysis. Of 16,473 stock items held by the Government Dockyard as at 30 June 2017, 8,412 were slow-moving items (5% up from 8,023 in 2013) with a total value of $73 million (34% up from $54.6 million in 2013). An analysis of these slow-moving items shows that 2,128 items with a total value of $10.5 million had been kept for more than 20 years, i.e. longer than the expected lifespans of all types of vessels in the existing government fleet (see Table 12).

Note 26: *From 2012 to 2016, a total of 61 vessels had been disposed of.*

Table 12

Analysis of slow-moving stock items
(30 June 2017)

Period without movement (Note)	Number of stock items	Amount	
(Year)	(Number)	($ million)	(%)
>5 to 20	6,284	62.5	86%
>20	2,128	10.5	14%
Total	8,412	73.0	100%

Source: Audit analysis of MD records

Note: The period is counted from the date of last movement to 30 June 2017.

4.7 Upon Audit's enquiries in July and September 2017, the MD said that:

(a) the review of slow-moving stock items required technical knowledge and involved the SSU, Material and Planning Management Unit and MS. Out of the 547 items identified in 2013, 68 items were disposed of in July 2016;

(b) it was necessary for some spare parts to be kept longer than 20 years (see para. 4.6) because it was not uncommon for a government vessel to remain in service after its expected lifespan if the vessel was well maintained. The manufacturers of the vessels might cease producing the relevant spare parts. Moreover, some spare parts could be modified to be used in other government vessels;

(c) the Task Force on Reform (see para. 1.13) was aware of the problem of slow-moving stock items but follow-up action could only be taken starting from January 2017 (see para. 4.5) because there was a need to prioritise reform work of the GFD and the need to identify expertise to undertake the task; and

(d) in April 2017, a working group was formed to carry out a review of the slow-moving stocks. To speed up the review process, it was considered necessary to involve additional manpower in the review for sorting out the spare parts for various types of government vessels. In mid-July 2017, the MD employed a Technical Adviser (with marine engineering background) on contract terms to review the slow-moving stock items. Judging from the complexity of the process, the MD aimed to complete the review in about 12 to 15 months, subject to a progress review in 6-month time, i.e. January 2018.

4.8 Audit noted the MD's recent actions to review the remaining 7,476 (8,023 less 547 — see para. 4.7(a)) slow-moving stock items identified in 2013. However, the delay of some 4 years before taking follow-up action on such items is unsatisfactory as any obsolete/dormant stock could not be disposed of in a timely manner to save storage space and realise any resalable value where commercial disposal is applicable. Moreover, the increase in slow-moving stock from 8,023 items in 2013 to 8,412 items as of June 2017 indicates that the MD needs to step up stock review to identify obsolete/dormant and slow-moving stock items.

Deficiencies of the GFIS for stock management purposes

4.9 The GFIS was commissioned in 1994 and enhanced twice in 1999 and 2015 (Note 27). The GFIS aims to provide an integrated operation platform operating under a system of web-based applications for the Government Dockyard to manage its physical assets, plan maintenance activities and initiate the processes of maintenance/spare part procurement for all government vessels and Government Dockyard plant facilities. The GFIS provides a repository of up-to-date information that facilitates the real-time retrieval of required information by the users and it can also be used to monitor and control budgets as well as expenditures for management over vessel maintenance, and assess the need for replacing a vessel.

4.10 However, Audit found that some intended benefits of the GFIS could not be realised despite the system enhancements in 1999 and 2015, as follows:

Note 27: *In addition to stock management, the GFIS was also used to coordinate maintenance activities and support services. The system enhancement in 2015 cost $8.5 million.*

(a) ***Stock re-order level.*** The GFIS was designed to generate the re-order level of a stock item to remind relevant MD staff to initiate replenishment process. However, Audit found that as at 30 June 2017, the stock levels of 1,979 inventory items were below their re-order levels indicated in the GFIS. In response to Audit's enquiry, the MD said that the re-order levels generated by the GFIS could not fully reflect the current stock replenishment practice of the Government Dockyard which had to take account of many factors, e.g. the consumption rates, frequencies of use, different maintenance cycles of various types of machinery, whether they were critical for certain vessel(s), re-order lead time, and whether the items were covered under bulk purchase contract(s) or not. The stock replenishment practice was still under review and the GFIS might need fine-tuning at suitable juncture; and

(b) ***Use of barcodes.*** The GFIS was designed to support the use of barcode identification technology to facilitate the monitoring of spare parts distribution and consumption, and automatic updating of inventory level. While the GFIS could generate barcodes for inventory items in the Government Dockyard stores, Audit found that they could not be used to automate the stock management operations. According to the MD, while there was limitation of scanning barcode into the GFIS to record the receipt and issue of stocks having regard to the existing workflow of stock movement at this stage, the possibility of adopting barcode scanning technology in receipt and issue of stocks to automate the processes would be covered in the review on the SSU to be conducted by the Task Force on Reform in the last quarter of 2017.

4.11 In Audit's view, the MD needs to take prompt actions to enhance the functions of the GFIS to ensure that it can support the Government Dockyard in effectively managing the vast stock of maintenance materials with an aggregate value of over $200 million.

Audit recommendations

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

(a) **step up stock review to identify slow-moving stock items and take timely follow-up actions to dispose of any obsolete/dormant stock; and**

(b) **take prompt action to enhance the functions of the GFIS (see para. 4.10) to ensure that it can support the Government Dockyard in effectively managing its vast stock of maintenance materials.**

Response from the Government

4.13 The Director of Marine agrees with the audit recommendations. She has said that the MD will speed up the disposal of obsolete/dormant stock and enhance the functions of the GFIS in order to improve the stock management system in the GFD.

Management of dangerous goods

4.14 ***Dangerous goods used and stored in the Government Dockyard.*** In the course of repairing or maintaining government vessels, the MD's in-house staff and contractors are required to handle dangerous goods controlled under the Dangerous Goods Ordinance, as follows:

(a) ***Diesel and petrol.*** Diesel and petrol are classified as Category 5 dangerous goods which give off inflammable vapour. To minimise fire risk, vessels undergoing maintenance/repair in the Government Dockyard are required to empty their fuel tanks first. Their fuel will be conveyed to approved stores of the Government Dockyard for temporary storage (i.e. diesel is pumped into the underground bulk storage of the Fuel and Oil Store and petrol in portable containers are stored in a dangerous goods store) and subsequent refuelling the vessels after completion of the maintenance/repair work;

(b) ***Oxygen and acetylene gas cylinders.*** Oxygen and acetylene cylinders are classified as Category 2 dangerous goods containing compressed gas. The maintenance contractors bring along their own oxygen and acetylene cylinders for welding and cutting of metal. According to the MD, several vessels may require hull plating renewal at the same time and use of a large number of oxygen and acetylene cylinders is inevitable; and

(c) ***Paints and thinner.*** Paints and thinner are also classified as Category 5 dangerous goods which give off inflammable vapour. For major vessel

maintenance, large quantities of paints are required especially for painting the hull. According to the MD, most vessels consume 300 litres of paints for hull painting and up to 900 litres for a few large vessels. The maintenance contractors could request the Government Dockyard to provide the required quantity of paints and thinner. After vetting and approval of the requests, the contractors could draw out the paints and thinner from the Government Dockyard's dangerous goods stores.

4.15 According to Section 6 of the Dangerous Goods Ordinance, no person shall manufacture, store, convey or use any dangerous goods except under and in accordance with a licence granted by the FSD under the Ordinance. The Dangerous Goods (General) Regulations (Cap. 295B) provide for some exemptions from such licensing requirement for the storage and conveyance of Categories 2 and 5 dangerous goods as shown in Table 13.

Table 13

Maximum storage and conveyance quantity of three types of dangerous goods exempted from licensing requirement

Dangerous goods	Maximum exempted quantity
Diesel and petrol	20 litres for petrol and 2,500 litres for diesel
Oxygen and acetylene cylinders	Two cylinders each for oxygen or acetylene
Paints and thinner	250 litres for paints and 20 litres for thinner

Source: Dangerous Goods (General) Regulations

4.16 While the provisions of the Dangerous Goods Ordinance do not apply to the Government, the MD has obtained the FSD's approvals on the quantities of the dangerous goods kept in its 10 dangerous goods stores (see Appendix E for details). According to the FSD, all dangerous goods not in use shall be returned to designated dangerous goods stores for safe storage.

4.17 In 2016, the MD commissioned a consultant to conduct a pre-feasibility study of the modernisation of the Government Dockyard. In its "Final User Interview and Site Study Report" of April 2017 and draft "Report of Best Practices, New Technologies and Equipment" of May 2017, the consultant pointed out the following issues in the MD's management of dangerous goods in the Government Dockyard:

(a) ***Handling of diesel and petrol.*** While vessels should dock in the Government Dockyard with a minimum quantity of fuel in the boat, in practice, it was not the case. The existing arrangement was that diesel was unloaded from vessels to tanks of 2,500 litres each which were mounted on a trawler and conveyed to the Fuel and Oil Store (see para. 4.14(a)). Petrol was unloaded to containers of 200 litres each for transfer to the dangerous goods store. As the Fuel and Oil Store for diesel and the designated dangerous goods store for petrol were away from the docking area and the defueling area, there was a long travelling distance for the transfer of fuels (see Appendix F for a layout plan of the Government Dockyard). Manual handling of petrol and diesel further increased the possibility of accidents;

(b) ***Storage of oxygen and acetylene cylinders.*** Notwithstanding that five dangerous good stores (see Appendix E) were provided for storage of oxygen and acetylene cylinders, the actual utilisation of these stores was low probably because of the long distance between the boat repair sheds and the dangerous goods stores. It was noted that cylinders had not been returned to the approved dangerous goods stores but stayed overnight at the boat repair sheds (Note 28); and

(c) ***Storage of paints and thinner.*** Similar to the oxygen and acetylene cylinders, three dangerous goods stores were designated for storage of

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Note 28: *In October 2017, the MD informed Audit that according to its understanding, there were no explicit stipulations in the Dangerous Goods Ordinance not allowing oxygen and acetylene cylinders to stay overnight. In fact, Occupational Safety and Health Administration under the Department of Labour of the United States Government explicitly stated that the oxy-acetylene cylinders: (i) in the general work industry were not considered to be in storage when they were either "in use" or "connected for use", and (ii) in the construction industry were considered to be in use when it was reasonably anticipated that gas be drawn from the cylinder within 24 hours. In this regard, the MD had liaised with the FSD and Labour Department for their advice. Considering that there would be clearer interpretations of the related Regulations, the Government Dockyard was prepared to better use the dangerous goods stores in accordance with the safety requirements.*

paints and thinner. However, they were also far away from the boat repair sheds which caused inconvenience to the maintenance contractors. This led to inefficiency in operation and discouraged the return of unused paints and thinner to the designated stores after daily operation.

4.18 For a better understanding of the scale of the abovementioned issues in management of dangerous goods, Audit examined the relevant operation records provided by the MD and noted the following issues:

(a) ***Handling of diesel and petrol.*** According to the MD, user departments had been advised to keep the quantity of fuel in a vessel to the minimum before it entered the Government Dockyard for service, although there might be practical difficulties to comply with the requirement in some cases, e.g. vessels returning to the Government Dockyard for unscheduled running repairs. Moreover, vessels of the law enforcement agencies needed to carry a certain quantity of petrol for operational reasons. In 2016, 39 petrol-fuelled vessels arrived at the Government Dockyard for maintenance service (comprising 18 for preventive service and 21 for running repair). Their fuel tanks (with storage capacity ranging from 200 to 1,300 litres) were 68% full on average. In one extreme case, a vessel was full-tanked (i.e. 500 litres) when it arrived at the Government Dockyard. As a result, the Government Dockyard had to handle large quantity of petrol unloaded from these vessels;

(b) ***Storage of oxygen and acetylene cylinders.*** According to the GFD (Government Dockyard) Safety Management Manual, maintenance contractors should keep their number of gas cylinders at a minimum and gas cylinders in excess of the exempted quantities should be kept in the specified dangerous goods stores. However, Audit found that the MD had not tracked the quantities of oxygen and acetylene cylinders stored/used by the maintenance contractors in the Government Dockyard to facilitate its monitoring of the compliance with the Safety Management Manual requirements. Audit inspections around 5 p.m. (towards the end of the normal operation hours of the Dockyard) on 16 August 2017 revealed that three major dangerous goods stores designated for the storage of the two types of cylinders were empty (see Photograph 2(b) for an example), indicating that the consultant's observed practice of gas cylinders not returning to the designated stores after daily operation had continued (see para. 4.17(b)). There is a need to devise, in consultation with the FSD,

a feasible and safe work practice for returning surplus gas cylinders, if any, to the approved dangerous goods stores when they are not in-use; and

Photographs 2(a) and (b)

Acetylene cylinder not found in the largest approved dangerous goods store

(a) Outside view	(b) Inside view
	

Source: Photographs taken by Audit staff on 16 August 2017

(c) ***Storage of paints and thinner.*** Audit examination of the MD's stock records revealed that on 81 days during January to July 2017, about 15,800 litres of paints and 3,360 litres of thinner were issued to the maintenance contractors for painting work of 117 vessels on 246 occasions (averaging 64 litres of paints and 14 litres of thinner on each occasion). According to the MD, the entire painting operation might take about 10 days depending on various factors such as vessel size, weather and humidity. On five occasions (see Table 14) with the largest quantities of both paints and thinner issued, there was no record to show that the unused paints/thinner had been returned to the dangerous goods stores after daily operation. The MD may consider issuing paints and thinner to meet the contractors' actual daily operation needs to minimise the safety hazards of unused paints/thinner (if any) not returning to the approved dangerous goods stores.

Table 14

Five occasions with the largest quantities of both paints and thinner issued

Date of issue	Vessel	Quantity of paints issued (Litre)	Quantity of thinner issued (Litre)
13.2.2017	A	579	124
8.5.2017	B	540	80
3.7.2017	C	545	65
6.4.2017	D	520	88
21.6.2017	E	399	114

Source: Audit analysis of MD records

4.19 Audit noted that in March 2017 the MD engaged another consultant to provide advice on how the Government Dockyard could better manage the dangerous goods to meet both its operational needs and the requirements of the Dangerous Goods Ordinance and its Regulations. The study was targeted for completion around the first quarter of 2018. Between August and October 2017, the MD also informed Audit that:

(a) taking the opportunity of recent renovation of the drenching system at the Fuel and Oil Store, the MD had requested the Electrical and Mechanical Services Department and the Architectural Services Department to explore the feasibility of installing a shore reception facility at the quay side which would allow direct transfer of petrol from vessels to the storage tanks. The MD had also reminded user departments to keep minimum fuel on board before sending their vessels to the Government Dockyard. The MD had been consulting the FSD to develop a permit-to-work system to enhance the safety for fuel transfer in the Government Dockyard; and

(b) as regards the storage issue of oxygen and acetylene cylinders, the MD had reviewed the situation and taken improvement measures including stepping up safety patrols at the contractors' work sites, requiring them to keep records of the number of oxygen and acetylene cylinders in use and in

storage (Note 29), and encouraging them to store any spare gas cylinders in the designated dangerous goods stores. In addition, the GFIS would be utilised to better monitor, control and manage the number of gas cylinders used by the contractors in the Government Dockyard. In order to further enhance safety operation, the MD was actively liaising with the FSD and Labour Department to improve the handling procedures of gas cylinders as well as petrol/diesel.

4.20 While the MD should continue with the improved measures already rolled out, the MD needs to implement additional interim measures to minimise the safety hazards. For example, the MD needs to closely monitor the compliance with the Safety Management Manual requirements on the storage of dangerous goods and consider issuing paints and thinner to contractors based on their actual daily operational needs.

Audit recommendations

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

(a) **closely monitor the progress of the ongoing consultancy study and feasibility study to develop long-term measures for further improving the management of dangerous goods in the Government Dockyard; and**

(b) **implement additional interim measures to minimise the safety hazards in the Government Dockyard, such as closely monitoring the compliance with the Safety Management Manual requirements on the storage of dangerous goods and considering the issue of paints and thinner to contractors based on their actual daily operational needs.**

Note 29: *According to the MD, as at 30 August 2017, there were 27 cylinders each of oxygen and acetylene held by its maintenance contractors.*

Response from the Government

4.22 The Director of Marine agrees with the audit recommendations. She has said that:

(a) the MD attaches great importance to industrial safety at the Government Dockyard; and

(b) apart from commissioning a consultancy study to develop long-term measures for improving the management of dangerous goods in the Government Dockyard, the MD has obtained additional manpower resources to upgrade the Industrial Safety Sub-unit to an Industrial Safety Unit and put it under the purview of the Support Services Section. The Industrial Safety Manager who is the Unit Head of the Industrial Safety Unit assumed the post in October 2017.

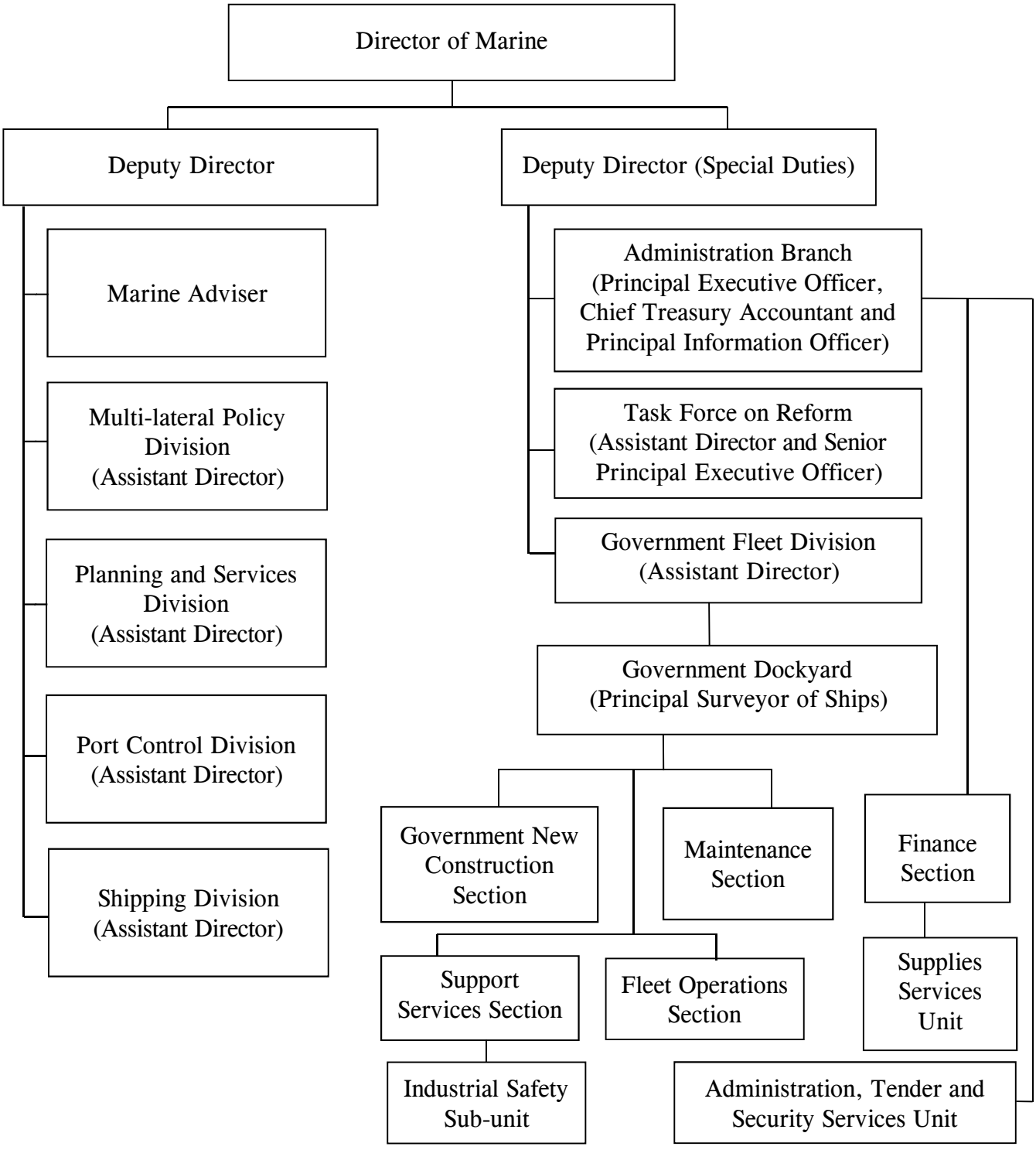
4.23 The Director of Fire Services generally agrees with the audit recommendations in paragraph 4.21. He has said that:

(a) all dangerous goods not in use (such as gas cylinders — see para. 4.18(b)) should be returned to the approved dangerous goods stores of relevant type for safe storage; and

(b) as the MD is devising a safety management system and mitigation measures to control the process of diesel and petrol transfer in the Government Dockyard (see para. 4.19(a)), the FSD will provide assistance to the MD by giving fire safety advice on the use of appropriate container and conveyance process.

Appendix A
(paras. 1.4, 1.6, 1.9 and 4.2 refer)

Marine Department: Organisation chart (extract) (31 March 2017)



Source: MD records

Appendix B
(paras. 1.5 and 3.5 refer)

Government fleet of vessels
(31 March 2017)

Department	Mechanised vessel		High-speed craft		Lighter	Dinghy/ inflatable boat	Beach craft/raft	Total
	MECV	MIMC	HSCL	HSCM				
	(Number)							
Leisure and Cultural Services Department						1	540	541
Hong Kong Police Force	36	6	10	43	6	9	17	127
Marine Department	25	2		5	21	4	1	58
Fire Services Department	9	5		2	1	16	9	42
Agriculture, Fisheries and Conservation Department	3	5		7		10		25
Customs and Excise Department	7		3	2		2	7	21
Civil Aid Service						11		11
Immigration Department	7							7
Water Supplies Department		3				4		7
Civil Engineering and Development Department	3							3
Correctional Services Department	2							2
Environmental Protection Department	1					1		2
Department of Health	1							1
Auxiliary Medical Service						1		1
Total	94	21	13	59	28	59	574	848

Legend: MECV = Major mechanised vessel MIMC = Minor mechanised vessel
HSCL = High-speed craft (large type) HSCM = High-speed craft (medium type)

Source: MD records

Appendix C
(para. 2.13 refers)

A chronology of events of the tender marking scheme review

Date	Event
December 2009	The CTB advised that the MD should conduct a review of the tender making scheme in consultation with the DoJ.
October 2010	The MD submitted a revised marking scheme for the DoJ's comments in the context of a procurement project for 11 speed craft of the HKPF (Note 1).
December 2010	The DoJ suggested that the MD should review the need for using a marking scheme. Since then, there were continuous exchanges of views and meetings between the MD and the DoJ. Subsequently, the discussion focused on how to standardise and trim the number of quality criteria in the marking scheme.
April 2011	The DoJ finalised and issued comments on the draft marking scheme to the MD, after a few earlier rounds of review and a meeting.
May 2011	With the DoJ's comments and corresponding amendments made on the draft, the revised marking scheme was submitted to the FSTB for comments before formal submission of the tender for the HKPF's speed craft for the CTB's approval. The FSTB later advised the MD that items in the marking scheme should be supported by measurable evaluation criteria. The MD then discussed with the HKPF on the FSTB's requirements and further revised the marking scheme.
July 2011	The further revised draft marking scheme was passed to the FSTB for comments.
August 2011	The FSTB advised the MD that some criteria for awarding marks on quality items should be more specific and accurate. The MD subsequently worked with the HKPF on the FSTB's comments. The FSTB gave further comments on the draft marking scheme and the mandatory requirements to the MD. The MD was further requested to consider adopting the life cycle cost approach in the price assessment stage (Note 2).
October 2011	Further to internal discussions and discussions with the HKPF, another version of the revised marking scheme was submitted to the FSTB for comments.

Date	Event
November 2011	The FSTB advised that the MD could put forward the revised marking scheme for the CTB's approval. To ensure that the revised marking scheme was legally in order, the MD sent the revised draft for the DoJ's comments. Apart from changes on the revised marking scheme, the DoJ also commented on other parts of the tender documents of the HKPF's speed craft project.
December 2011	The DoJ completed its review and issued to the MD its comments on the revised draft marking scheme.
January 2012	The revised marking scheme was sent to the FSTB.
February 2012	The DoJ proposed further textual changes to the marking scheme to align it with the rest of the tender documents. In the light of these changes, the MD sent another revised version of the marking scheme to the FSTB for approval.
April 2012	A meeting was held with the FSTB and it was concluded that the marking scheme for specific vessel type could be submitted for the CTB's approval instead of one standard marking scheme to cover all projects with due regard to the uniqueness of individual vessel characteristics.
May 2012	The FSTB requested the draft marking scheme of the HKPF's speed craft project be submitted for their preview and comments. On the basis of the FSTB's further comments, the further revised version came up eventually.
August 2012	The FSTB sent the price assessment criteria adopted for the supply of vehicles to the MD for reference. As a result, the MD revised the marking scheme again and a complete set of tender documents was sent to the DoJ for comments.
September 2012	The tender documents for the HKPF's speed craft project with the revised marking scheme cleared by the DoJ were formally submitted to the CTB for approval.
October 2012	The marking scheme for the HKPF's speed craft project was finally approved by the CTB.

Date	Event
November 2012	The approved marking scheme was standardised to cover projects for speedboats with high performance engines. After obtaining the CTB's approval for its use for speedboats, the new marking scheme was applied to the tender for 11 speed craft with high performance engines for the HKPF in March 2013. For the tenders of two other projects, i.e. two catamaran speedboats for MD and a steel vessel for the ImmD in September 2013 and April 2014 respectively, relevant marking schemes were used after obtaining the GLD Tender Board's approval in 2014.
August 2014	The new marking scheme was used until FSTB Circular Memorandum No. 8/2014 was issued in August 2014 to remind bureaux/departments to avoid excessive use of marking scheme. The MD had stopped using marking scheme for new construction projects since then.

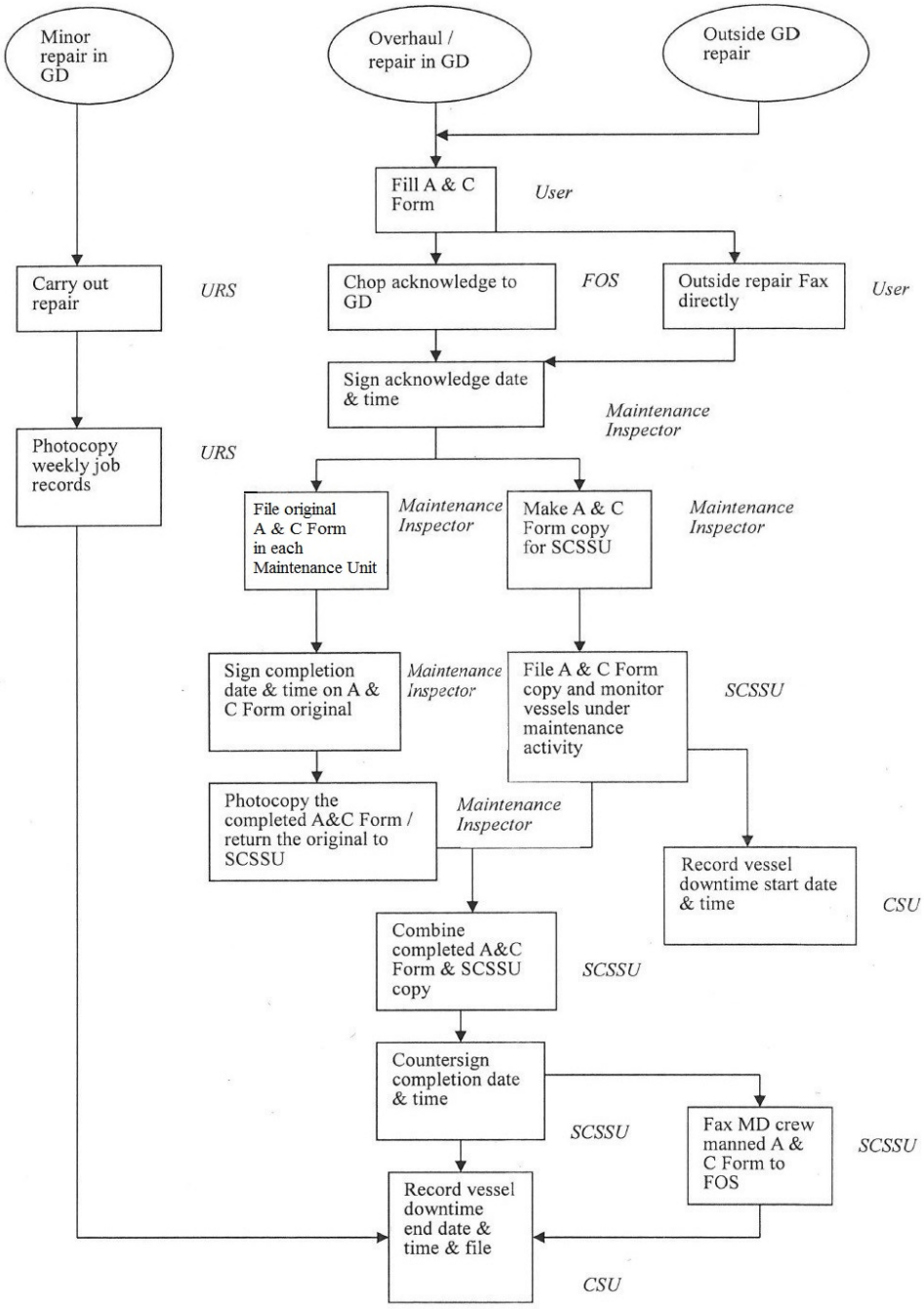
Source: MD records

Note 1: According to the MD, it would facilitate the consideration by the DoJ of the revised marking scheme through an actual vessel procurement project.

Note 2: According to the MD, considering that it was a totally new idea, the MD took some time to study and evaluate the idea and its implication prior to applying it to the marking scheme in order to ensure that the tender evaluation could be conducted in a pragmatic, feasible, accurate and fair manner.

Appendix D
(para. 3.6 refers)

Marine Department's quality manual of 2016 (extract)



Existing A&C Form Flow Chart as on May 2004

Legend: CSU = Clerical Services Unit FOS = Fleet Operations Section
GD = Government Dockyard URS = Urgent Repair Squad
SCSSU = Scheduling Coordination and Seatrial Sub-unit

Source: MD records

Appendix E
(paras. 4.16 and 4.17(b) refer)

Approved storage quantities of dangerous goods at the Government Dockyard (30 June 2017)

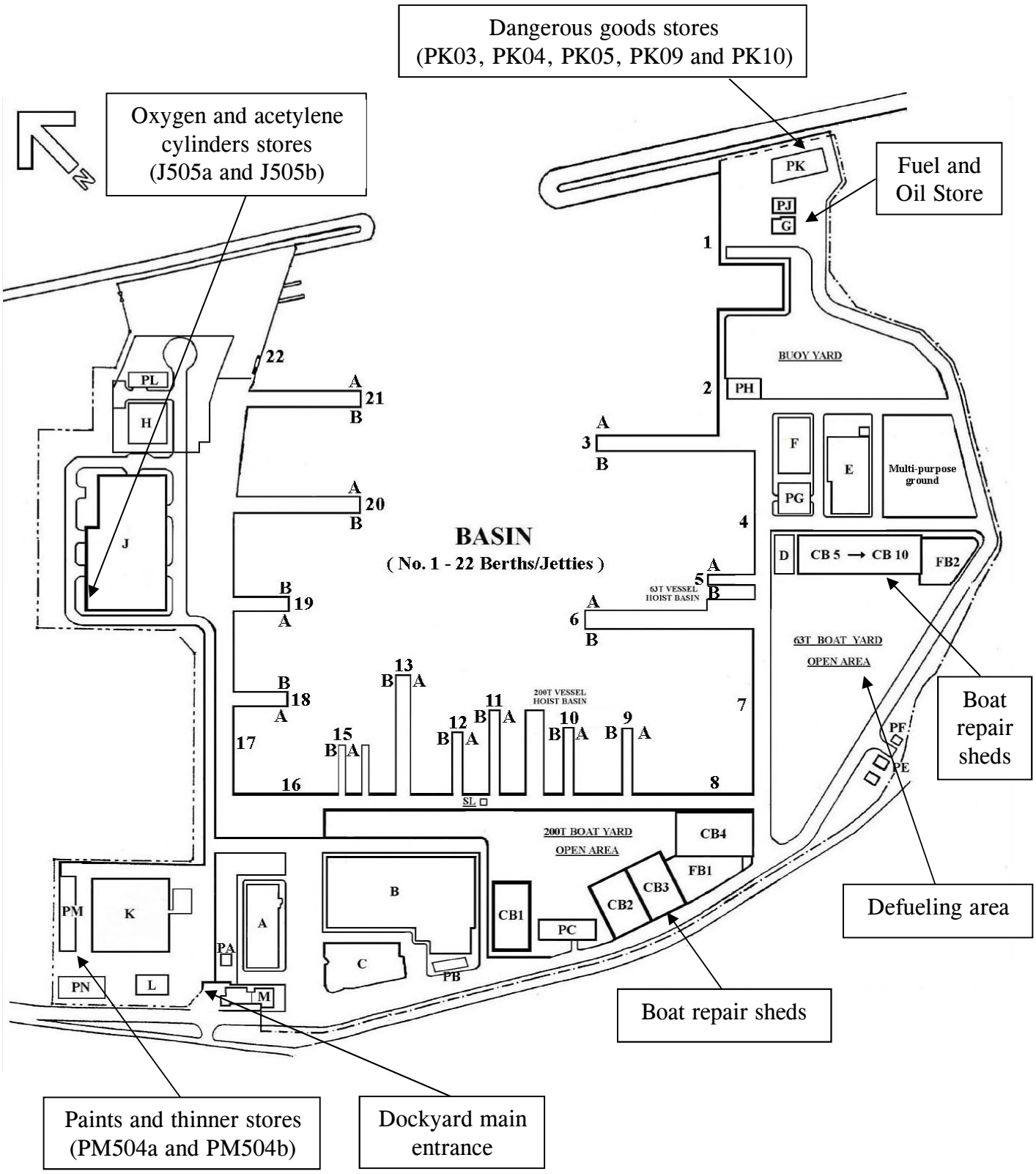
Store (Note)	Dangerous goods stored	FSD approved quantities	Date of FSD's approval
Diesel and petrol			
Fuel and Oil Store	Diesel and petrol	120,000 litres of diesel 20,000 litres of petrol	February 1997 and December 1999
PK10	Petrol	7,000 litres	October 2013
Oxygen and acetylene cylinders			
PK04	Oxygen cylinder	8 × 65 kilograms/cylinder	July 1995
PK05	Oxygen cylinder	8 × 65 kilograms/cylinder	July 1995
PK09	Acetylene cylinder	40 × 65 kilograms/cylinder	October 1995
J505a	Oxygen cylinder	6 × 6.8 cubic metres/cylinder	January 2001
J505b	Acetylene cylinder	4 × 6.2 cubic metres/cylinder	January 2001
Paints and thinner			
PK03	Paints and thinner	6,000 × 5 litres/tin of paint 400 × 5 litres/tin of thinner	December 2009
PM504a	Paints and thinner	21,083 litres	November 1999
PM504b	Paints and thinner	21,000 litres	

Source: *MD records*

Note: *Locations of the dangerous goods stores are shown in the layout plan of the Government Dockyard in Appendix F.*

Appendix F
(para. 4.17(a) refers)

Layout plan of the Government Dockyard



Source: MD records

Acronyms and abbreviations

A&C Form	Arrival and Completion Form
AFCD	Agriculture, Fisheries and Conservation Department
Audit	Audit Commission
C&ED	Customs and Excise Department
COR	Controlling Officer's Report
CTB	Central Tender Board
DoJ	Department of Justice
FC	Finance Committee
FSD	Fire Services Department
FSTB	Financial Services and the Treasury Bureau
GFD	Government Fleet Division
GFIS	Government Fleet Information System
GLD	Government Logistics Department
GNCS	Government New Construction Section
HKPF	Hong Kong Police Force
HSCL	High-speed craft (large type)
HSCM	High-speed craft (medium type)
ImmD	Immigration Department
MD	Marine Department
MECV	Major mechanised vessel
MIMC	Minor mechanised vessel
MS	Maintenance Section
m	metres
SCOGC	Standing Committee on Government Craft
SoS	Surveyor of Ships
SPRs	Stores and Procurement Regulations
SSU	Supplies Services Unit
THB	Transport and Housing Bureau