

PROCUREMENT AND MAINTENANCE OF GOVERNMENT VESSELS

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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).

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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

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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

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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

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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

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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

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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

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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

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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).

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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**

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- (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.