

Evaluation of fleet procurement and maintenance

Overview of the Fleet Procurement and Fleet Maintenance programs

The Fleet Procurement (FP) and Fleet Maintenance (FM) programs are responsible for the “cradle to grave” management of CCG vessels and assets throughout the four phases of the CCG’s national Life Cycle Management System including conception, acquisition, in-service, and disposal. The evaluation was designed to address key information needs of CCG senior management regarding the capacity of the CCG to conduct vessel maintenance activities, including line one, two, and three maintenance conducted by ITS and other program delivery partners (i.e., Fleet Operations).

As of 2022-23, the CCG fleet consists of 124 active vessels managed across 16 large and small vessel classes. Most vessels have one or two planned maintenance periods per year and the duration of each period varies by vessel class.

Program clients supported by the FM program:

- Icebreaking services
 - Aids to Navigation
 - Waterways Management
 - Marine Security
 - Marine Hazards and Environmental Response
 - Search and Rescue
- Conservation and Protection
 - Ecosystems and Ocean Science
 - Canadian Hydrographic Services
 - Fisheries Management

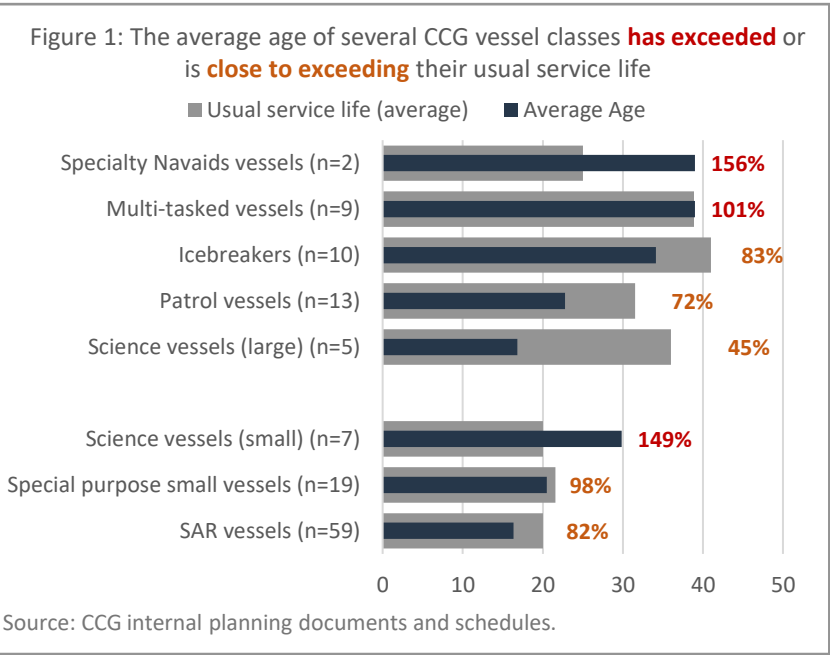
About the evaluation

SCOPE: The scope of the evaluation focused on the period between 2017-18 to 2022-23. Some activities starting prior to 2017-18 were included when they continued after 2017-18. The in-service phase was the focus of this evaluation as this is where the bulk of fleet maintenance activities take place. Procurement activities have been well documented through previous reports and audits.¹ Thus, with respect to fleet procurement, the scope of the evaluation was limited to procurement activities, such as the National Shipbuilding Strategy, that have had a significant impact on vessel maintenance and CCG program delivery as part of the broader operational context for the FM program.

METHODOLOGY: The evaluation gathered the perspectives of key program staff and program clients. Evidence was gathered through multiple lines of evidence including interviews, a survey, document and file reviews, financial and administrative data analyses, as well as site observations.

Key findings: operational context

- Fleet procurement and maintenance activities take place within a complex and evolving environment. Several external factors, such as the aging fleet (Figure 1), lengthy procurement processes, and the state of the ship and boat building industry influence the scope of maintenance work required and the CCG’s capacity to undertake the work.
- Delays with the delivery of NSS ships have placed pressure on the FP and FM programs, requiring them to implement interim measures, such as vessel life extensions and modification projects, which are not part of typical life cycle management activities.
- The arrival of the first NSS vessels led to challenges within the CCG due to a lack of organizational expertise and infrastructure to support the transition of new vessels into service.

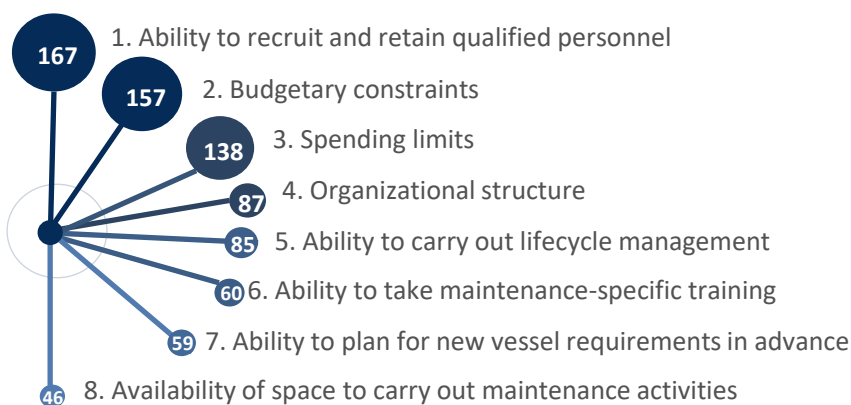


¹ For instance, the Auditor General of Canada conducted an independent audit of the NSS in 2021.

Key findings: capacity

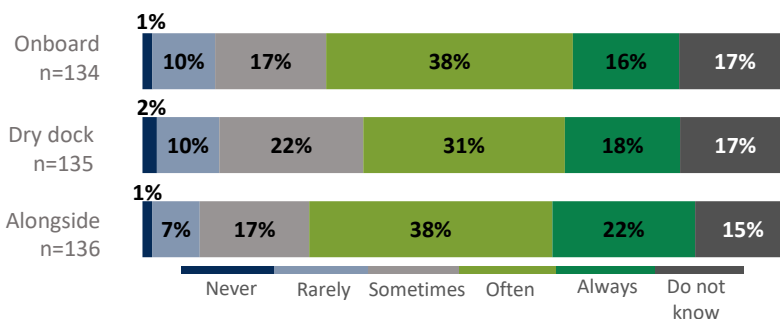
- While external factors are increasing the demand and workload for vessel maintenance operations, several internal factors also impact the program's capacity to deliver maintenance. These include the ability to recruit and retain qualified personnel, budgetary constraints, spending limits, the cyclical nature of the maintenance funding envelope, challenges with the organizational structure, the ability to carry out lifecycle management, as well as the ability to take maintenance-specific training (Figure 2).

Figure 2: Internal challenges as ranked by survey respondents [weighed ranking]



n = 137

Figure 3: Between 49% and 60% of survey respondents indicated that alongside, dry dock, and on-board maintenance activities are **always** or **often** delivered as planned

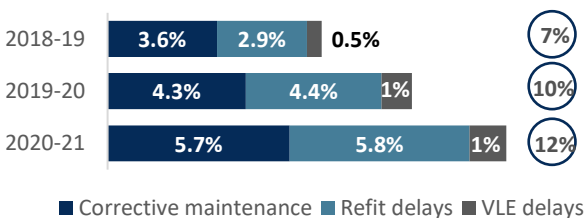


- The delivery of fleet maintenance activities were assessed through indirect means due to a lack of formal and consolidated reporting on the implementation of maintenance activities. Alongside, dry dock, and onboard self-maintenance were found to be completed as planned half of the time (Figure 3). Refit and vessel life extension maintenance activities have experienced delays, with refit activities being more significantly impacted.

- Despite the complex operational environment and capacity challenges, CCG is still able to maintain vessels and vessel electronic assets, systems, and applications in a relatively good condition, meeting regulatory and safety requirements.

Key findings: risk to departmental programs and mitigation

Figure 4: Proportion of Fleet Operations Plan vessel days lost due to maintenance-related issues (2018-19 to 2020-21)



Source: CCG operational data extracted from internal systems on February 10, 2022.

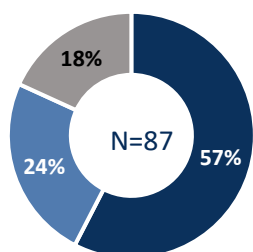
- Maintenance related issues have resulted in vessels not always being available and reliable to deliver CCG programs, particularly when corrective maintenance needs arise and when maintenance work cannot be completed within planned periods (Figure 4). Given that an increase in corrective maintenance-related issues is closely aligned with an aging fleet, and delays with the delivery of new vessels continues, it is expected that the number of non-operational vessel days due to unplanned maintenance will continue to increase in the coming years.

- Vessel days lost due to maintenance-related issues have had an impact on CCG and DFO program delivery (e.g., the planned allocated vessel time lost was: 12% in 2021-22 and 27% in 2022-23 for the Programs sector; 8% for the offshore science programs and 19% for inshore and hydro science in 2022-23). Associated risks extend beyond DFO/CCG programming and include reputational risk to DFO/CCG should mandate or international commitments not be met as well as risks to industries and communities that depend on DFO/CCG services.

- Mitigation strategies employed by DFO/CCG encompass several approaches, including chartering vessels, optimizing vessel usage, adjusting programming, and continuing to implement large-scale refurbishment measures (Figure 5).

Figure 5: Summary of planned projects, by project type (2021-22 to 2028-29)

- Vessel life extension
- Mid-life modernization
- Special projects



Source: Vessel Modification Program working schedule, August 2023.

Key findings: collaboration and decision-making

- Operational priority setting with respect to fleet maintenance is well-supported via various mechanisms, such as the Vessel Condition Survey (VCS), Fleet Operation Plan (FOP), Vessel Maintenance Management Manual (VMMM), and Multi-Year Maintenance Plan (MYMP), were found to be mostly working well (Figure 6).
- Nevertheless, decision-making was found to be somewhat ineffective (Figure 7) and could be improved with regards to regional involvement in vessel procurement, as well as access to consolidated maintenance information to facilitate reporting and analysis.
- The roles and responsibilities of fleet maintenance partners are somewhat defined in multiple guidance documents. However, in practice these roles and responsibilities are not always well-understood.
- Communication and coordination is effective in some cases, but challenges exist due to the multiple layers of collaboration required and there are opportunities for improvement.

Figure 6: Many survey respondents (33% to 61%) **agreed** or **strongly agreed** that tools are effective

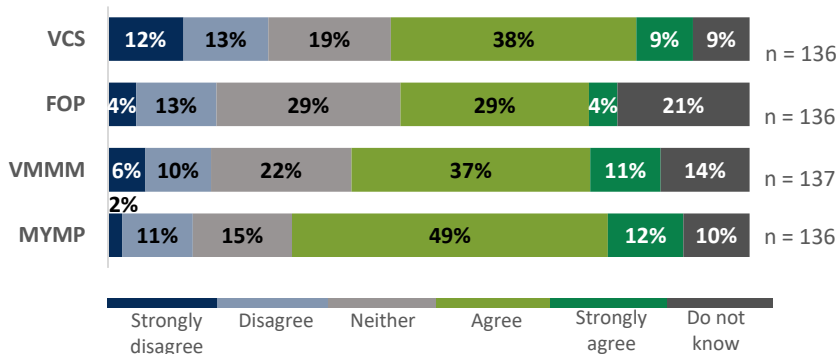
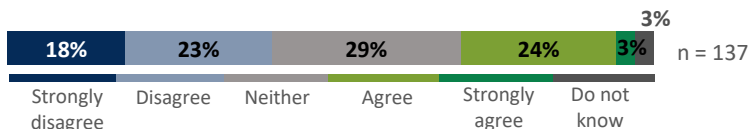


Figure 7: Some survey respondents **disagreed** or **strongly disagreed** (41%) that decision-making with respect to fleet maintenance was effective



Recommendations

Recommendation 1: It is recommended that the Deputy Commissioner, Shipbuilding and Materiel, in coordination with the Assistant Deputy Minister, People and Culture, stabilize the organizational structure of Integrated Technical Services, including ensuring positions are classified appropriately, finalizing the organizational charts, and completing required staffing.

Recommendation 2: It is recommended that the Deputy Commissioner, Shipbuilding and Materiel implement a standard process to holistically collect, track, and report on the delivery of fleet maintenance activities to support ongoing measurement of performance and ensure that roles and responsibilities for collecting and reporting on the data are clearly established and communicated.

Recommendation 3: It is recommended that the Deputy Commissioner, Shipbuilding and Materiel, in coordination with the Chief Financial Officer, collaborate to review and identify where improvements could be made to maintenance-related financial management processes, particularly those related to tools and support for procurement and forecasting.

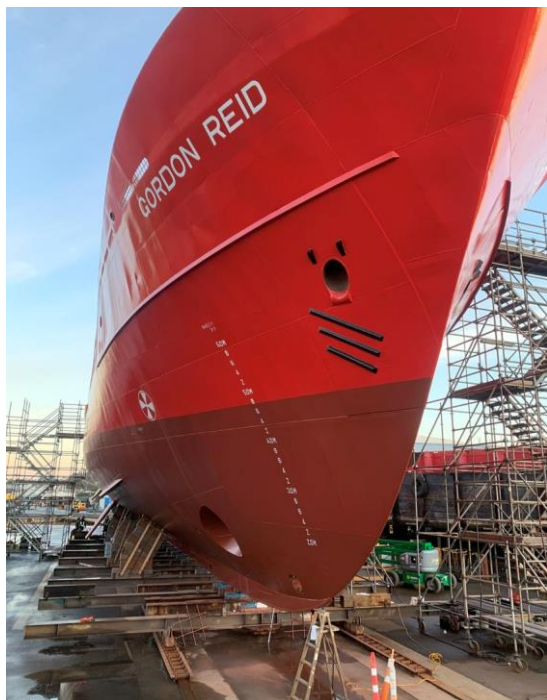


Photo credit: Canadian Coast Guard