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Report of the
**Auditor General
of Canada**
to the House of Commons

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Chapter 2
Fisheries and Oceans Canada—
Contributing to Safe and Efficient Marine Navigation



Office of the Auditor General of Canada

The December 2002 Report of the Auditor General of Canada comprises 11 chapters, Matters of Special Importance—2002, a Foreword, Main Points, and Appendices. The main table of contents is found at the end of this publication.

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For copies of the Report or other Office of the Auditor General publications, contact

Office of the Auditor General of Canada
240 Sparks Street, Stop 10-1
Ottawa, Ontario
K1A 0G6

Telephone: (613) 952-0213, ext. 5000, or 1-888-761-5953
Fax: (613) 954-0696
E-mail: distribution@oag-bvg.gc.ca

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Chapter

2

Fisheries and Oceans Canada

Contributing to Safe and
Efficient Marine Navigation

The audit work reported in this chapter was conducted in accordance with the legislative mandate, policies, and practices of the Office of the Auditor General of Canada. These policies and practices embrace the standards recommended by the Canadian Institute of Chartered Accountants.

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Fisheries and Oceans Canada

Contributing to Safe and Efficient Marine Navigation

Main Points

2.1 Fisheries and Oceans Canada is one of several departments and agencies that contribute toward the safe and efficient navigation of vessels in Canada's waterways. We focussed on the Department's role in preventing accidents and supporting the efficient navigation of our waterways.

2.2 We found that users of Canada's navigational support services generally consider them to support safe waterways and provide services that generally meet their navigational requirements. However, the Department has limited performance information that shows how it contributes to safe and efficient marine navigation. The Department has not cost-effectively managed the functions we examined and changes must be made to ensure the services continue to meet user needs in the future.

2.3 The Department faces changing service demands, evolving waterway usage, continuing fiscal pressure, and increasing technological demands because of international obligations and advances in the shipping industry.

2.4 There are significant barriers preventing the Department from modernizing and delivering its navigational support services and boating safety activities cost-effectively, including

- failure to ensure that there is one national program,
- regional operations that are not held accountable for implementing national policies and meeting international obligations,
- key elements not present to ensure accountability,
- inadequate integration of navigational support services,
- provision of a service that does not contribute to the mandate for safety and efficiency, and
- outdated legislation used for unintended purposes.

2.5 While new technologies and services have been introduced since 1983, many of our current observations about the Canadian Coast Guard are similar to observations in our 1983 Report, Chapter 13, Marine Transportation Program, and in our 2000 Report, Chapter 31, Fleet Management. We are concerned that the Department has not yet dealt with these management issues.

Background and other observations

2.6 The Department carries out both preventive and responsive activities to support its commitment to maritime safety and efficient use of Canada's waterways. In this audit, we examined the preventive aspects of the

Department's commitment to safe and efficient waterways. We examined two important parts of these responsibilities: navigational support services and recreational boating safety.

2.7 The navigational support services that we examined included aids to navigation, channel maintenance, waterways protection, marine communications and traffic services, and navigational charts. The recreational boating safety activities that we examined included the programs that support the promotion of boating safety and the regulation of the construction, inspection, equipment, and operation of pleasure craft.

2.8 The activities that we examined had total estimated expenditures of \$220 million (unaudited) in 2001–02. In addition, there were approximately \$30 million (unaudited) in revenues, mostly associated with the Marine Services Fees.

2.9 The implementation of the Marine Services Fees has created a difficult working relationship with the marine industry. There still appears to be an underlying belief by industry that the Canadian Coast Guard has not been able to change sufficiently to deal with its concerns and that the fee is too high for the services that are provided. However, the Marine Services Fees have had a positive effect through the increased role of the marine industry in determining service levels.

The Department has responded. Fisheries and Oceans Canada accepts our findings. The Department's response to our recommendations, included in this chapter, describes the actions it is taking or intends to take.

Introduction

2.10 Canada’s marine transportation system is an important part of our economy, culture, and environment, and serves some important functions, including

- providing a global gateway to world markets;
- providing domestic transportation of goods and passengers;
- supporting all its users—fishers, recreational, and others;
- supporting military and other government activities; and
- supporting other economic activity, including aquaculture and oil and gas development.

2.11 The marine transportation system takes place within important ocean, coastal, and freshwater ecosystems, which are known as its natural infrastructure. These ecosystems support fish, marine mammal, and bird species. These waterways can also be important sources of water for human consumption. Exhibit 2.1 provides further information on the importance of the marine transportation system to Canadians.

Exhibit 2.1 The importance of the marine transportation system to Canadians

Marine freight traffic in 2000	349 million tonnes ¹
Percentage shipped, in terms of tonnage, by marine mode between Canada and overseas countries in 2001	over 90 percent ¹
Estimated number of Canadians participating in recreational boating in 2001	8 million ²
Estimated number of recreational boats in 2001	2.7 million ²
Total estimated ferry traffic in 2000	40 million passengers and 17 million vehicles ¹
Cruise ship passengers visiting Canada’s five largest ports in 2001	1.4 million passengers ¹
Number of commercial fishing vessels in 1999	24,200 ²

Source: ¹Transport Canada
²Fisheries and Oceans Canada

2.12 While we have natural infrastructure, some waterways require investment to make them useable, including dredging, channel maintenance, and ice breaking. In addition, navigational support services such as regulations, charts, and navigational aids are required to make navigation of the waterways safe and commercially efficient.

The government’s role in the marine transportation system is complex

2.13 The federal government plays an important role in ensuring the safety of users, contributing to Canadian competitiveness, preventing pollution, assisting with national security issues, and meeting international obligations.

Federal responsibility for managing Canada’s marine transportation system is divided among many departments and agencies.

2.14 The complex nature of the government’s role in the marine transportation system means that it is difficult to determine the relative contribution of each department or agency. Departments and agencies often indicate that they are contributing to the same objective; frequently this objective is maritime safety.

2.15 Exhibit 2.2 shows the federal departments and agencies that play a major role in managing and regulating the marine transportation system.

Exhibit 2.2 Major federal responsibilities in Canada’s marine transportation system

Transport Canada	<ul style="list-style-type: none"> • Regulation of commercial vessels and mariners. • Regulation of fishing vessels. • Ship safety inspection and other port state control functions. • Port and pilotage policy. • Lead department representing Canada’s interest in international governing organizations (for example, the International Maritime Organization). • Lead department regarding transportation security issues.
Fisheries and Oceans Canada	<ul style="list-style-type: none"> • Regulation of recreational boats and boaters. • Provision of marine navigational services including marine communications and traffic services, aids to navigation, channel maintenance, navigable waters protection, navigational charts, and icebreaking. • Marine search and rescue, vessels. • Environmental response. • Fleet provides support to other government departments. • Harbours (financial support of core fishing harbours).
Canadian Transportation Agency	<ul style="list-style-type: none"> • Economic regulation of transportation under federal jurisdiction (for example, pilotage and port fees).
Transportation Safety Board of Canada	<ul style="list-style-type: none"> • Investigation and reporting on transportation accidents, including marine accidents.
Pilotage authorities	<ul style="list-style-type: none"> • Provision of pilotage service.
Port corporations or authorities	<ul style="list-style-type: none"> • Operation of ports.
National Defence	<ul style="list-style-type: none"> • Sovereignty and military security. • Marine search and rescue, coordination, aircraft, and vessels in a supporting role. • Support to other government departments.
Royal Canadian Mounted Police	<ul style="list-style-type: none"> • Policing, including boating safety.

Source: Relevant legislation, departmental performance reports, and annual reports

Canada must meet national and international responsibilities

2.16 The *Oceans Act* gives Fisheries and Oceans Canada the authority to provide a coast guard and hydrographic service. Under section 40 (2) of the Act, the Minister of Fisheries and Oceans will provide

. . . coast guard and hydrographic services to ensure the facilitation of marine trade, commerce and safety in collaboration with other ministers of the Government of Canada.

2.17 The *Canada Shipping Act* gives the Minister of Fisheries and Oceans specific responsibility for providing aids to navigation and vessel traffic services, and regulating pleasure craft operation.

2.18 The basic expectations for navigational support services are set out in the International Convention for the Safety of Life at Sea (SOLAS Convention). Canada is a signatory to this international convention, which governs large commercial vessels operating in multiple jurisdictions. Transport Canada establishes regulations that set out the navigational equipment requirements for commercial vessels operating only in Canadian waters. These regulations can be different from the SOLAS requirements. Therefore, the Coast Guard must tailor its programs to meet both SOLAS and domestic requirements.

2.19 The SOLAS Convention sets out the types of navigational support services that signatory nations must provide. However, the actual design of the specific navigational support systems is left to the individual countries. A country that does not provide navigational support is not likely to receive significant traffic from SOLAS vessels. These vessels account for most of Canada's commercial vessel traffic to overseas countries and as a major trading nation, it is in our national interest to provide the necessary support for these vessels.

2.20 Other international non-governmental organizations provide technical advice and guidance on the delivery of navigational support services. These organizations have mainly focussed on the needs of SOLAS vessels. Canada does not have to follow this guidance; however, these are the minimum internationally recognized performance standards.

2.21 There is limited international guidance for the navigational support needs of pleasure craft and other operators. Fisheries and Oceans Canada and Transport Canada jointly determine the navigational needs of pleasure craft, domestic commercial shippers, and other operators, after consultation with national/regional user group representatives.

Important trends have impacted the Department's delivery of marine navigational support

2.22 Historically, marine navigation support systems have been designed primarily to reduce risks associated with commercial shipping. Canada has seen a gradual but steady increase in the number of people using our waterways for recreational purposes. Recreational boaters tend to have less

training and less sophisticated navigational equipment on their boats than commercial vessels.

2.23 The 1990s saw a revolution in marine navigational technology, affecting both the safety and efficiency of navigation. For example, satellite-based global positioning and advances in communications have led to the development of many other new technologies. Many vessels now make use of electronic navigational charts that are integrated into their navigational guidance equipment.

2.24 Fisheries and Oceans Canada has had to provide support for modern navigational systems. In addition, there are new technologies being developed that will further revolutionize marine navigation. While new systems have been introduced, the Department cannot eliminate all of the older systems as there is continuing demand from some users or a need for reliable backup.

2.25 Since 1994, the Department has had to operate under significant fiscal restraint. The 1995 merger of the Canadian Coast Guard into Fisheries and Oceans Canada's operations has been challenging because of the different corporate cultures. In addition, savings anticipated from the merger have not been fully realized, although funding has already been reduced.

2.26 In 1996 the government introduced the Marine Services Fees to recover part of the cost of providing marine navigational support to the commercial shipping industry. These fees have contributed to a difficult working relationship between government and industry.

The Department plays a limited role in marine security

2.27 Transport Canada is responsible for leadership in marine security issues. Currently, Fisheries and Oceans Canada is mainly responsible for supporting other departments and agencies in matters of marine security. This includes the collection and dissemination of information through the Marine Communications and Traffic Services centres, aerial surveillance, and the presence of Coast Guard vessels on our waterways.

Focus of the audit

2.28 The audit focussed on the following preventive aspects of Fisheries and Oceans Canada's commitment to safe and efficient waterways:

- aids to navigation;
- channel maintenance;
- navigable waters protection;
- marine communications and traffic services;
- navigational charts, publications, digital and other navigational information; and
- boating safety, including promotion and regulation of the construction, inspection, equipment, and operation of pleasure craft.

These activities are carried out by the Canadian Coast Guard, including its Office of Boating Safety and the Canadian Hydrographic Service, which are all part of Fisheries and Oceans Canada.

2.29 Our audit objective was to assess the extent to which Fisheries and Oceans Canada's management of its preventive activities supports its commitment to provide for safe and efficient waterways in a cost-effective manner. Exhibit 2.3 shows Fisheries and Oceans Canada's estimate of the 2001–02 cost of the activities that we examined.

Exhibit 2.3 The estimated cost of Fisheries and Oceans Canada's 2001–02 preventive activities

Preventive activities	Gross expenditures ¹ (millions)
Navigational Support Services	
Canadian Coast Guard	
• Marine Navigation Services	\$ 109
• Marine Communications and Traffic Services	60
Canadian Hydrographic Service	41
Total	210
Boating Safety	
Canadian Coast Guard	
• Office of Boating Safety	10
Total	\$ 220

¹Gross expenditures are unaudited and do not include capital expenditures.

Source: Fisheries and Oceans Canada

Observations and Recommendations

There is a need to modernize

Technology and user needs are changing rapidly

2.30 Marine navigation has been greatly affected by rapid and accelerating technological development. Satellite global positioning technology has helped the marine industry to develop new navigational tools for safer and more efficient navigation. Modern commercial vessels use sophisticated equipment based on this technology. Even fishers and pleasure craft operators are increasingly using new technology to navigate their vessels. Many users are demanding that Fisheries and Oceans Canada provide the infrastructure and tools to support new technologies.

2.31 The introduction of the Marine Services Fees, designed to recover a portion of the cost of certain navigational support services provided to commercial shippers, has led industry to believe that other governance arrangements would lead to a more cost-effective service. Industry expects that the Coast Guard's operations should be made more cost-effective, at the very least.

The Department consults with users

2.32 The implementation of the Marine Services Fees led to the revitalization of several useful national and regional forums for consultation with user groups. Transport Canada and Fisheries and Oceans Canada co-ordinate certain user group consultations.

2.33 However, the interests of the user groups can be region specific. The interests of the Pacific, the Great Lakes, and the St. Lawrence River industry groups can be quite different from each other. For example, there are different climate conditions, cargoes, and seasonal services. The Department must be able to identify and understand regional needs while still operating cost-effectively and ensuring that it meets national and international requirements.

The Department is aware of the need for change

2.34 For several years, the Department has recognized the need to modernize its operations. The Canadian Coast Guard is looking to leverage technology and make better use of its asset and human resource base in order to achieve a more cost-effective service. However, progress has been slow. In 2001, a Coast Guard modernization initiative was started, incorporating the following four elements:

- Fleet Management Improvement;
- Integrated Technical Support Strategy;
- Marine Aids Modernization Vision 2001, a continuation of an earlier initiative; and
- Electronic Navigation.

2.35 The concept of the Electronic Navigation initiative is not yet developed. The other initiatives are at various stages of progress but none is fully implemented.

2.36 The Canadian Hydrographic Service has also recognized that there are problems with its hydrographic program. There is a continuing need to clear a backlog in Notices to Mariners, which are a source of information on critical changes to navigational risks on waterways. In addition, only approximately 50 percent of Canada's southern waters and 20 percent of northern waters are surveyed to modern international standards. Many charts are not compatible with modern navigation techniques. In March 2001, the Department obtained \$14.4 million in supplementary funding over two years to address these issues. However, the Canadian Hydrographic Service has identified a total of \$49.5 million in work over five years that is needed to address these problems. The Canadian Hydrographic Service has informed us that its existing resources will not be enough for it to address all of the issues that it has identified.

2.37 The Coast Guard has not yet developed a comprehensive plan for its Marine Communications and Traffic Services operations. It is possible that Marine Communications and Traffic Services centres could be further consolidated and new automated technologies introduced. These changes

would affect the number and location of employees and the types of skills needed. Alternative means of providing navigational aids could have a similar impact. As part of planning for changes, the Coast Guard must assess the impact on its operations and implement national strategies to deal with it.

There are barriers to change

2.38 Although the Department has identified the need to modernize and improve delivery of its navigational support services and boating safety activities, we found that there are significant barriers that prevent the Department from making the required improvements.

The Coast Guard's headquarters has not ensured that there is one national program

2.39 Under the Department's management model, each program area within the Canadian Coast Guard's headquarters is responsible for setting national objectives, policies, standards and procedures, and monitoring the performance of regional operations. In April 2000, the Coast Guard's headquarters was reorganized. This reorganization was intended to improve service to the regions, eliminate overlap between the Coast Guard and the rest of the Department's headquarters, and facilitate staffing on an indeterminate basis.

2.40 During the course of our audit, we found that most of the headquarters staff that we spoke to had only recently assumed their responsibilities, many positions had yet to be staffed, and/or the national functional areas had been inactive for some time. Some areas were more advanced than others. For example, the aids to navigation area had put the Marine Aids Modernization Vision 2001 in place and set out national direction for this area. The Marine Communications and Traffic Services area was just beginning to develop a long-term strategy and update levels of service expectations. Other service areas were just being organized, such as Integrated Technical Services, which is responsible for purchasing, maintaining, and repairing the Coast Guard's equipment.

2.41 In some cases, national standards are just being developed or updated. There has been little national guidance to help make levels of service decisions in relation to risk.

2.42 The Coast Guard's headquarters has only limited means to ensure that national standards or targets are met. There is limited regular reporting of either financial or non-financial information relating to expected levels of service. Quality assurance is an important role that is delegated to headquarters groups under the management model. However, there is no quality assurance function in headquarters. Without national goals, standards, and a monitoring capability, the Department has no way to hold managers accountable for their performance.

2.43 This lack of national leadership has had consequences. For example, the lack of a national Marine Communications and Traffic Services strategy has resulted in regions implementing their own approaches. This in turn has led to duplication of effort and the implementation of information systems

that do not meet national requirements. Information and control systems were developed by two regions to help monitor and communicate with mariners (case study, “Two information systems serving the same purpose”). Each of these systems fulfills its role; however, there is no need for two separate systems.

2.44 The Canadian Coast Guard reduced the number of Marine Communications and Traffic Services centres from 44 to 22 in the mid-1990s. It is possible that modern technology could allow the Coast Guard to reduce the number of centres even further. While the overall resource requirements, including salaries, have not been quantified, a reduction in the number of centres could have an impact on overtime and other human resource issues. The Coast Guard estimates that 22 percent of its current staff will leave their jobs because of retirement or other reasons over the next four years. Existing communications equipment will require replacement or upgrades. The Coast Guard has recognized this issue and recently started a national review of its Marine Communication and Traffic Services business line.

Two information systems serving the same purpose

Background

Canada’s 22 Marine Communications and Traffic Services centres give vital support to mariners by providing marine navigational information, monitoring vessel movement, and supporting marine communication. Operators involved in monitoring traffic movements integrate information from a number of sources such as radar screens, radio communications with ships, navigational charts, ship transit data, and other sources. The Canadian Coast Guard has been working towards a better means of integrating these various sources of information.

Development of two integrated information systems

In August 1995, the Laurentian Region, now the Quebec Region, obtained authority from Coast Guard headquarters to begin the development of the Information System on Marine Navigation (INNAV). The first stage of the project was planned for completion in 1998 at an estimated direct cost of \$7.3 million. This stage was the delivery of a fully integrated real-time information system that would be installed in six centres in eastern Canada.

The Region encountered several project management problems that resulted in cost overruns and delays in project completion. In 1999 the project became the responsibility of the Integrated Technical Services unit at headquarters. It reduced the scope of the project to activities that directly supported marine communications and traffic services and that could be completed by May 2001.

In April 2002, the first stage of INNAV was installed in eight centres in eastern Canada. The total estimated direct cost of the project increased to \$13 million. The Department has informed us that INNAV is meeting user needs even though some of the original system capability was not delivered.

Over the last fifteen years, the Pacific Region has been developing systems to maintain historical records of vessel movements. Its various incrementally developed systems have evolved into its own integrated information system called the Vessel Traffic Operational Support System (VTOSS). The Pacific Region did not seek national approval for the development of VTOSS and funded it out of regional operating budgets. The Region indicates that the

system meets its needs; however, a formal systems development approach was not used, resulting in an almost total lack of systems documentation. In addition, VTOSS is dependent on the employee who developed it for maintenance.

VTOSS and INNAV are not linked; therefore, information cannot be transferred between the two systems. The Marine Communications and Traffic Services headquarters must combine information from the two systems to prepare statistical reports on national program activity. The Department is now confronted with the cost of operating and maintaining two systems that are designed to serve the same purpose.

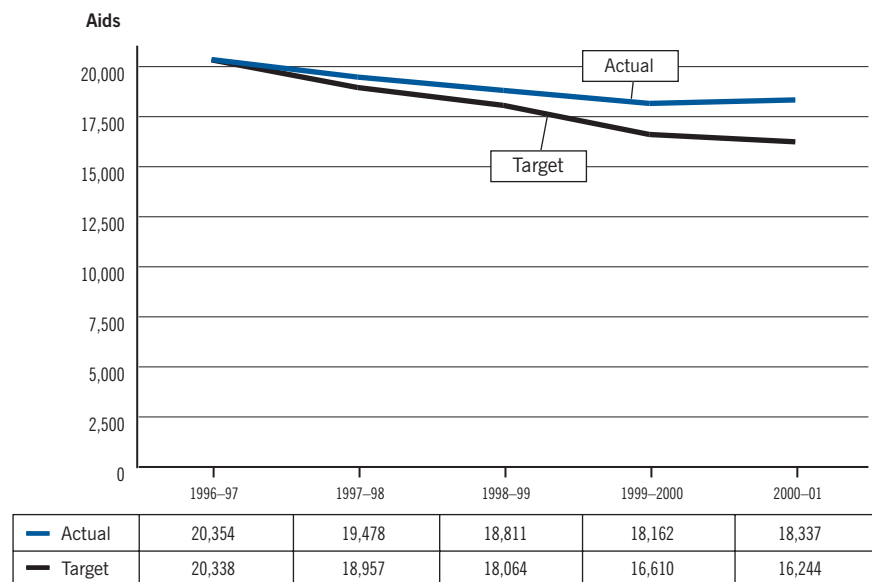
Our concern

This case study illustrates the consequences of a lack of national leadership in developing important information systems. Both regions used poor project management practices and, in the end, the Department has paid for two systems where only one national system is required.

2.45 In 1996, in response to Program Review, the Coast Guard initiated the Marine Aids Modernization initiative. Through this initiative and its successor, Marine Aids Modernization Vision 2001, the Coast Guard expected to achieve significant savings by rationalizing and modernizing its systems of aids to navigation. The Coast Guard is making progress on the Marine Aids Modernization initiative but is not moving as quickly as anticipated by the Program Review decision. It has made advances in certain areas such as solarization, high performance paints, and long life lights. However, reductions in the number of aids to navigation have been less than expected and aids to navigation must be serviced more frequently than planned. In addition, the reliability of the year-round floating lighted aids to navigation, a focus of the initiative, is below the national reliability standard. The Coast Guard recognizes that its aids to navigation funding requirements exceed the resources available. It has had to obtain funding from other sources within its own budgets or delay aids to navigation service delivery. Exhibit 2.4 shows the shortfall in the number of short-range aids to navigation removed compared the number planned for removal under the Marine Aids Modernization initiatives.

2.46 We also found that the Coast Guard operates and make decisions differently from region to region. For example, none of the regions have followed the national policy to review each short-range aid to navigation system. This includes a review of all the aids to navigation in a waterway at least once every five years. National peer reviews that were designed to determine regional compliance with national policies have not been performed since 1999.

Exhibit 2.4 Reduction in short-range aids to navigation compared with plan



Source: Fisheries and Oceans Canada

2.47 Coast Guard headquarters has not been providing the leadership envisaged in the Department's management model. There are a number of headquarters initiatives underway designed to have an impact on national leadership (paragraph 2.34).

There are five regional coast guards

2.48 We repeatedly observed that each of the Department's regions operate differently from the others. We expected some differences according to the needs of users in each region; however, we are concerned about the extent of the variation in practices. This is especially important given the Department's responsibility to meet national and international requirements.

2.49 For example, we expected that there would be standardized planning for capital intensive areas such as the 22 Marine Communications and Traffic Services centres across the country. Instead, we found that the planning for the centres is largely regionally based with very little common purchasing or maintenance approaches. This has resulted in a multiplicity of equipment and systems across the country. Each region needs to have its own technical support that is capable of maintaining the local systems.

2.50 We observed that regions responded to the interests of regional user groups by starting pilot projects that did not necessarily support national requirements. For example, the Pacific Region has participated in communications pilot projects for its Marine Communications and Traffic Service centres, including the development of a regional Automatic Identification System. Problems can arise when a region pursues pilot projects independent of national and international standards and direction (case study, "Lack of national co-ordination for pilot projects").

2.51 Regions can redirect budgets and resources from national to regional issues, depending on priorities. For example, the Maritimes Region has redirected its already limited resources from its aids to navigation program to other priorities, including fisheries issues. One impact of this has been that buoys that primarily service the needs of fishers were not put into the water until after the start of important fisheries. Subsequently, they were not removed from the water before ice formed in the winter, resulting in the loss of many buoys.

2.52 Focus on specific regional interests may be done at the expense of the national program. This practice can also undermine the long-term interests of all the user groups by weakening the Department's ability to respond nationally.

2.53 **Recommendation.** The Canadian Coast Guard should ensure that there are up-to-date national policies, standards, and levels of service expectations for its navigational support services. It should also develop the capability to monitor the implementation of these policies, standards, and expectations.

Key elements are not present to ensure accountability

2.54 The primary strategic objective of the activities we audited is to contribute to maritime safety and efficiency of navigation. We found that users of Canada’s navigational support services generally consider them to support safe waterways and provide services that generally meet their navigational requirements. However, the Department has limited performance information to show how it contributes to these objectives.

Lack of national co-ordination for pilot projects

Background

The international marine community has been conducting ongoing research into integrating modern technologies such as global positioning, satellite communication, and advanced Very High Frequency radio communication. The term Automatic Identification System is now used to represent a new system that will provide mariners with real time, ship-to-ship and ship-to-shore digital navigation information.

Canada, largely through the Canadian Coast Guard, has conducted its own research into this system.

In 1994, Coast Guard headquarters, in consultation with industry, began its first study of it, including a 1996 pilot project on the St. Lawrence River.

The project final report, issued in August 1997, supported implementation of the system in Canadian waters. It also recommended that the Coast Guard and industry assess, on a national basis, the benefits and feasibility of its implementation. It concluded that there was a need to optimize the use of the existing marine communications equipment.

In addition, this project assessed the strengths and weaknesses of two competing radio technologies being considered internationally as a key part of the Automatic Identification System infrastructure. The study supported the use of the technology that was the strongest candidate for an international standard. Subsequently, this technology

has been adopted as the international standard.

Pacific Region pilot project

In 1997, the Pacific Region, in collaboration with the local industry advisory group, began testing a system that was similar to the Automatic Identification System. However, it used radio technology different from the eventual international standard.

The pilot project built on technology that was being used to monitor tug activity on the West Coast. The Pacific Region and the local industry advisory group have been trying to broaden the applications that the system could support. However, despite the 1997 recommendations from the national study, the Pacific Region continued to provide support to this pilot project for a further two years.

Starting in 2000, the Pacific Region attempted to integrate the pilot project technology into its existing information and control system (case study, “Two information systems serving the same purpose”). However, this effort was abandoned because the data could not be transmitted in a way that met the international standard. During the same period, the region has also been investing in technology that is compatible with the international standard.

National role in monitoring pilot projects

As with many areas, the national role in Automatic Identification System

research and pilot projects has not been strong. Since the 1997 report, Coast Guard headquarters has not played a strong co-ordinating role in the area as it has had limited knowledge of regional initiatives. Even though Coast Guard headquarters has a staff member who is an internationally recognized expert, the regions, for the most part, failed to include him in their projects.

In June 2002, the Coast Guard established a formal national project team for the implementation of the Automatic Identification System and other related technologies. The need for national co-ordination of Coast Guard activities followed the International Maritime Organization’s decision to accelerate the implementation of this internationally.

Our concern

This case study illustrates the problems associated with pilot projects conducted on a regional basis without consideration of national policy or international standards. It also shows the need for national leadership in the evaluation of emerging technologies.

With limited funding available for research and capital projects, the Coast Guard should ensure that pilot projects are directed towards national priorities. It should also ensure that knowledge gained from pilot projects is considered in ongoing management decisions.

2.55 In its 2001 *Performance Report*, the Department states that its contribution to maritime safety will be demonstrated by

- reducing the number and severity of collisions and groundings in Canada’s waterways,
- helping people in distress on Canadian waters, and
- preventing loss of life and damage to property.

2.56 In the same report, the Department also says that the achievement of its contribution to efficiency of navigation will be demonstrated by operational services and infrastructure that support commercially sustainable maritime industries. There is no further information on how these activities will affect the efficiency of navigation.

2.57 In the last year, the Canadian Coast Guard has prepared results-based management and accountability frameworks for each of its business and service lines. The frameworks are designed to help the Coast Guard plan, analyze, and report on its performance.

2.58 These frameworks show the link from day to day activities to the ultimate impact on things like maritime safety. Exhibit 2.5 provides an example of the results chain included in the results-based management and accountability framework for the Office of Boating Safety.

2.59 The results-based management and accountability frameworks are an important first step in the Coast Guard’s focus on results and are a reasonable approach to managing for results and ensuring accountability. However, the following steps have yet to be completed:

- Establishing clear, measurable, concrete targets for the identified outputs and immediate outcomes for each framework.
- Identifying who is accountable for achieving targets and managing resources.

Exhibit 2.5 Office of Boating Safety results chain

Inputs	Activities	Outputs	Outcomes	Impacts
Resources (human, financial and assets)	Boating safety promotion, regulation, and partnerships	Boating safety guides and brochures, boating safety regulations, and partnerships	Public awareness of boating safety issues, behavioural change, compliance with regulations, increased enforcement of regulations, fewer recreational boating related fatalities and injuries, and public confidence in the Office of Boating Safety	Safe waterways and their users, clean environment, and support the Canadian economy

Source: Fisheries and Oceans Canada

- Aligning budgeting and resource allocation with the frameworks.
- Developing or identifying sources of information to measure results.

2.60 A significant amount of work remains to make the frameworks fully operational. This will not be easy because the Coast Guard is not currently managed in the way specified by the frameworks.

2.61 The Department is facing many tough decisions about how to provide its services in the future, and managers are looking at different ways of delivering services. Ideally, they should be able to compare the current cost of providing a service with the cost of providing it in other ways. However, it is not always possible to obtain cost or activity information in sufficient detail to do these comparisons.

2.62 The Department's pilot performance reports in 1996 and 1997 provided data and analysis that were relevant to the Department's maritime safety and efficiency of navigation objectives even though the main focus was on activities and output information. For example, in 1996 the Department reported on the reliability of navigational aids, which is important to the success of this function. Currently, the Department collects the basic data needed to measure the reliability of navigational aids. However, it only reports it internally on an ad hoc basis.

2.63 The four departmental performance reports that followed the 1996 and 1997 pilot performance reports reflect a lack of direction in reporting performance for these activities. Although the programs have been stable, the nature of the indicators changes annually. The Department has steadily scaled back the data presented, and the quality of analysis has subsequently deteriorated.

2.64 Some of our concerns can be demonstrated by recreational boating safety, an area where Fisheries and Oceans Canada takes the lead. The Department's 2001 *Performance Report* uses charts and supporting analysis to show that it has decreased the number of recreational boating fatalities. It is plausible that the Department's activities may have contributed to reduced fatalities but there is no underlying information presented in the Report to demonstrate the link between this result and the Department's activities. The draft framework shown in Exhibit 2.5 is intended to show that link. Although the Department plays a lead role in this area, it is important to note that many other organizations also contribute to boating safety, including police forces, non-governmental organizations, boating associations, and manufacturers.

2.65 In addition, the 2001 *Performance Report* has charts that are presented in a way that exaggerate the changes in the number of fatalities and the number of licensed recreational boats from 1991 to 2000. Exhibit 2.6 compares the Department's presentation of this data with our own and suggests that the trends are not as dramatic as the Department reports.

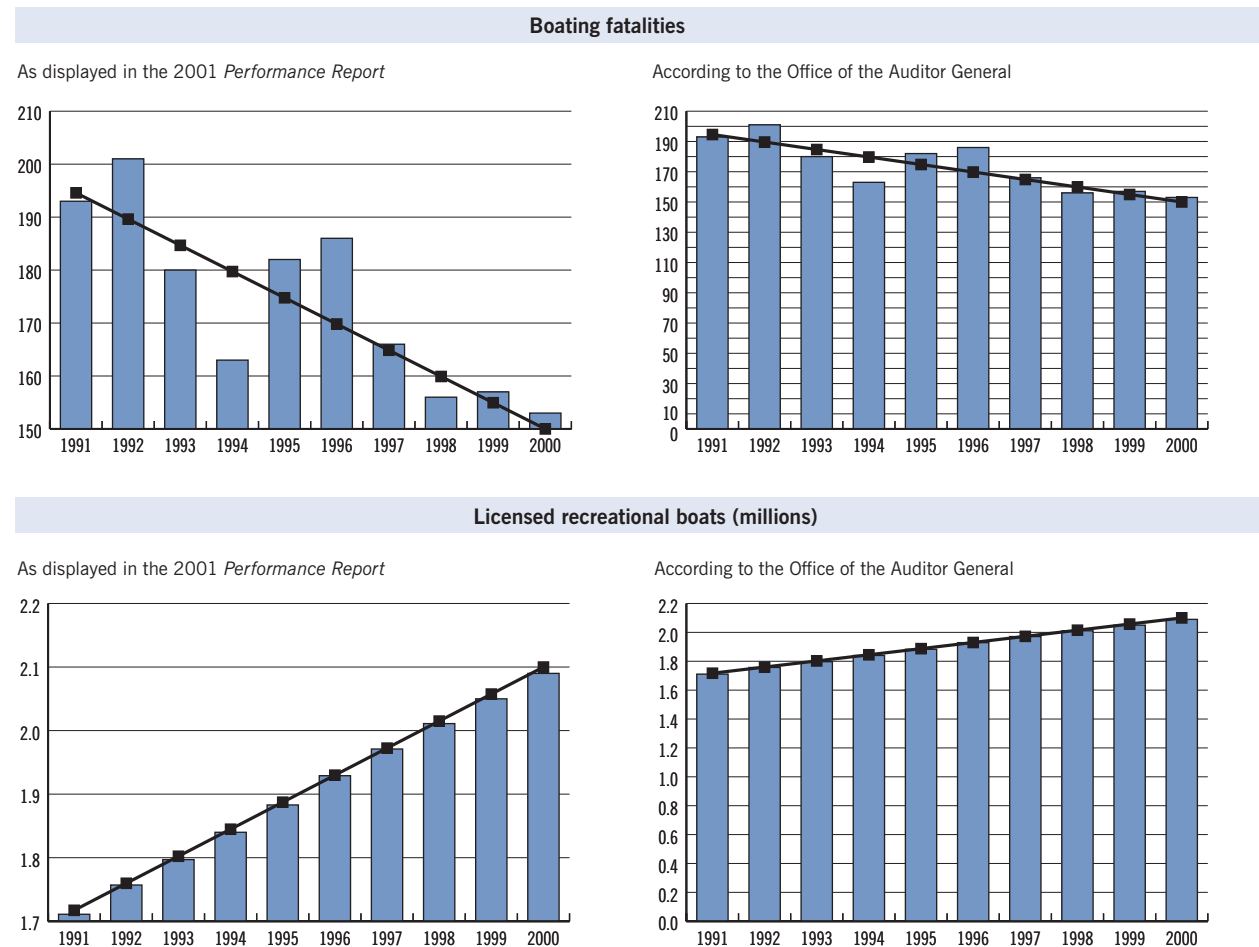
2.66 The number of boating fatalities reported for 1999 and 2000 are based on projections rather than actual results. In our opinion, a projection based on past trends is not an accurate or appropriate method of reporting results.

2.67 The Department has informed us that it intends to improve its public reporting in its *2002 Performance Report*. It intends to focus on outcome information using the frameworks as its guide. The Department has also informed the Office that it will gradually increase the results information in subsequent performance reports as that information becomes available.

2.68 Recommendation. For its navigational support services and boating safety activities, Fisheries and Oceans Canada should do the following:

- complete the implementation of its results-based management and accountability frameworks;
- establish clear, measurable, concrete targets for the identified outputs and immediate outcomes for each framework;
- identify who is accountable for achieving targets and managing resources;
- align budgeting and resource allocation with the frameworks; and
- develop or identify sources of information to measure results.

Exhibit 2.6 Presentation of licensing and fatality information



Source: Fisheries and Oceans Canada

Risks to safety and efficiency have not been regularly assessed

2.69 Recent international guidelines have placed an emphasis on the completion of regular risk assessments for major waterways. The Canadian Coast Guard played a major role in developing these guidelines. These assessments are a proactive means of determining the navigational support services that are needed to help avert marine accidents. As well, regular assessment of risk can contribute to more cost-effective management of the services provided by selecting the appropriate combination of services to help reduce risk.

2.70 The Coast Guard has developed a draft risk management policy and framework to ensure that there is a more systematic approach to risk management decision making. The draft policy and framework are consistent with the international guidelines.

2.71 The Coast Guard has not yet conducted comprehensive risk analyses for any Canadian waterway. Decisions to change levels of service are based on informal risk assessments. This means that the Coast Guard cannot determine the most appropriate combination of navigational support services that are needed for a particular waterway.

2.72 The development of draft guidance on risk management is an important step in modernizing the Coast Guard's approach to its preventive responsibilities. The challenge is to put the draft guidance into actual practice.

2.73 Recommendation. The Canadian Coast Guard should complete and implement its draft guidance on risk management.

Service delivery is not integrated

2.74 The Department's separate business lines deliver its navigational support services to external users. Internal Coast Guard units, such as Integrated Technical Services and Fleet Management, provide important support services to the business lines, including those that deliver the navigational support services.

2.75 We found that these business lines and shared services do not operate as an integrated business process to deliver the specific expected outcomes. Each has separate planning processes and, for the most part, has not considered the implications of activities conducted in the other business or service lines. Agreements have not yet been completed between the business lines and shared services to set out roles, responsibilities, and deliverables.

2.76 The Coast Guard has initiated a business performance management process to integrate strategic, business and long-term capital planning, resource allocation, and performance measurement. Management decision-making will be aligned with the strategic objectives and will focus on achieving the desired results. We support the intent of this initiative; however, it was not sufficiently advanced for us to audit.

2.77 Recommendation. Fisheries and Oceans Canada should develop and implement strategies to modernize and integrate the delivery of its navigational support services to meet user needs.

Outdated legislation is used for unintended purposes

2.78 Under the *Navigable Waters Protection Act*, the Department is responsible for protecting the public right to navigation; however, these efforts have been seriously hampered by outdated legislation.

2.79 The *Navigable Waters Protection Act* became law over 120 years ago. It was originally intended to protect marine navigation routes by controlling the logging industry and the construction of bridges, dams, and other obstructions. Today, the operating environment has changed significantly and the program's clients and stakeholders have grown in number and variety with the introduction of new waterway uses. The Act has become a way for the general public, municipalities, environmentalists, and boaters to resolve conflicts with other waterway users. However, most of these conflicts are not about navigation.

2.80 The Act has frequently been used in the approval of aquaculture sites. However, it cannot deal with the rapidly expanding industry that is increasingly competing with traditional waterway users. The number of aquaculture permit applications per year has grown from 172 in 1997 to 354 in 2001. Many of the issues surrounding these sites are more related to competing social, economic, and environmental interests rather than navigation. The *Navigable Waters Protection Act* is one of the few ways that interested parties can make their concerns known and trigger a review under the *Canadian Environmental Assessment Act*. There is a significant backlog of applications.

2.81 The Department has observed widespread non-compliance with aquaculture permit conditions, and, in some cases, sites have been established before permits were issued. The Department devotes a small number of resources to ensure that applicants meet the specified conditions after approval. It relies primarily on complaints from other users to ensure compliance.

2.82 Fisheries and Oceans Canada's 1997–98 *Report on Plans and Priorities* identified the need to amend the *Navigable Waters Protection Act*. The Department is aware of the problems created by the Act and it has recently begun a policy review of the legislation.

Activities undertaken that do not support safety and efficiency

2.83 Despite the Department's ongoing commitment to reducing costs in its operations, we found that it conducts activities that do not support its maritime safety and efficiency of navigation objectives. One example of this is staffed light stations.

2.84 The Canadian Coast Guard began its program to automate, remove staff, and remotely monitor light stations in 1970. However, it still maintains 51 staffed light stations. Because of a 1998 government decision, the

Department staffs 50 light stations in the Newfoundland and Pacific regions, largely for heritage reasons. The other remaining light station, in the Maritimes Region, is staffed for sovereignty purposes.

2.85 In December 1998, the Treasury Board approved \$47.6 million in operating funds and \$24.5 million in capital funds over five years (1998–99 to 2002–03) to continue staffing light stations in the Newfoundland and Pacific regions. In addition, ongoing operating funding of \$12.9 million annually was approved for years after 2002–03. The Treasury Board requested that the Department review the decision to maintain staffing at the light stations after five years.

2.86 The Department does not track or monitor the costs of maintaining and operating staffed light stations and therefore it does not know whether it has been given appropriate funding. Without this information, it will be difficult for the Department to meet the Treasury Board review requirements.

2.87 The Department is in a difficult position. What is the role of light keepers given the largely automated state of the existing staffed light stations? How can the light keepers play an effective role in supporting heritage objectives given the remoteness of many of the staffed light stations? We also noted that the Coast Guard maintains more than the minimum number of staff needed at some light stations. It is unclear how staffed light stations serve a heritage objective.

2.88 It is now accepted that staffed light stations are not necessary for maritime safety and navigational efficiency. A 1998 Canadian Coast Guard study found that most industrialized countries were removing staff from light stations, and

- the United States had removed staff from 474 of 475 light stations since 1990,
- England had removed staff from 68 of 72 light stations,
- Ireland had removed staff from all of its 80 light stations, and
- Australia had removed staff from 102 of its 104 light stations.

2.89 There is no consistent approach within the Department to determine and maintain the heritage value of Canada's staffed and automated light stations. We observed that the Maritimes Region is actively seeking partners to assume responsibility for light stations that are no longer needed by the Coast Guard. This is a balanced approach to maintaining our heritage.

2.90 Recommendation. Fisheries and Oceans Canada should develop and implement an overall strategy for the future of its light stations considering maritime safety and heritage objectives.

There is limited focus on a core mandate

2.91 Recreational boating is a popular activity, with as many as 2.7 million boats and 8 million boaters in Canada. The Office of Boating Safety, as part of the Canadian Coast Guard, implements the Department's responsibilities for recreational boating safety. Since April 1999, regulations under the *Canada*

Shipping Act have been introduced to place restrictions on boat operators, require mandatory operator competency for powerboats, define minimum safety equipment, and introduce other safety precautions.

2.92 Recreational boater competence is an important safety concern with more than 150 boating fatalities annually. The Office of Boating Safety encourages safe practices and responsible boating through education and certification of operator competency.

2.93 The Office of Boating Safety has base funding of \$3 million; however, its actual expenditures over the last three years have ranged from \$7 million to \$10 million. Reallocating funding from within the Department's and Coast Guard's budgets have covered the difference. Even with the additional funds, the Office of Boating Safety does not have the ability to ensure compliance with the new regulations.

2.94 The Office of Boating Safety relies almost exclusively on third parties such as police forces, the Coast Guard auxiliary, the private sector, and non-governmental organizations for educating boaters and for enforcement and compliance. However, it has not determined that relying on third parties has been successful.

2.95 There are a number of problems associated with the boater competency certification that is delivered by third parties. The Competency of Operators of Pleasure Craft Regulations, introduced in 1999, require all recreational boaters operating a powered recreational vessel less than four metres in length (including personal watercraft) to carry proof of operator competency by 15 September 2002. The Office of Boating Safety estimates that 75 percent, or about 1.6 million licensed recreational boats fall into this category.

2.96 By the end of 2001, only 308,000 operator competency cards had been issued. The Office of Boating Safety has no record of persons who have obtained such a card, it does not know how many more boaters must be certified, and it will be unable to determine the extent of compliance with the competency requirements.

2.97 The Department is responsible for construction standards for small recreational vessels. The Office of Boating Safety relies on self-reporting from manufacturers that their vessels conform to standards; although it can do inspections, it rarely does this because of a lack of resources. From time to time, it does undertake investigations in response to complaints. There are risks associated with the Office of Boating Safety's limited ability to ensure that construction standards are met (case study, "Difficulty in ensuring compliance with construction standards for pleasure boats").

2.98 Recommendation. Fisheries and Oceans Canada should gather and monitor information on boating safety to assess the adequacy of third party delivery, determine the extent of compliance with regulations, and review the adequacy of the resources provided to this program.

Difficulty in ensuring compliance with construction standards for pleasure boats

Background

The Minister of Fisheries and Oceans is responsible, under the *Canada Shipping Act*, for all matters related to the safety and licensing of pleasure craft. Regulations under the Act require that pleasure craft meet construction standards. Among others, these construction standards set out the specifications for flotation material used in pleasure craft up to six meters in length. Flotation material helps keep vessels afloat in case of an accident.

Problems with foam flotation

In 2000, the Office of Boating Safety received a complaint about the construction of aluminum boats by a specific builder. After an initial investigation, the Office of Boating Safety focussed its review on the various types of foam flotation in the marine industry.

Builders are responsible for ensuring that vessels meet the construction

standards. Many builders indicated that the foam material used was imported and met comparable specifications in the United States. However, the Office of Boating Safety found that two of the eight foam suppliers contacted could not show that their product met United States standards. The review also found that most builders and suppliers contacted were unaware of the Canadian standards. None of the eight suppliers of foam flotation contacted were able to demonstrate that their product complied with Canadian construction standards.

The review noted that concerns were raised by many knowledgeable parties that, over time, foam flotation in small vessels becomes saturated with water. This would limit the buoyancy of such vessels in case of an accident.

Since the review was completed in early 2001, the supplier of the foam to the builder initially investigated and two other suppliers have demonstrated that

their product does, in fact, meet the Canadian construction standards. However, the Office of Boating Safety has not yet received information from the remaining suppliers demonstrating that their products meet Canadian standards.

The Office of Boating Safety has limited capacity to deal with issues related to construction standards. There are approximately 300 builders of small boats in Canada and only three qualified inspectors within the Office of Boating Safety to deal with construction standards.

Our concern

We are concerned about the limited capacity of the Office of Boating Safety to ensure that pleasure boats meet Canadian construction standards.

The Marine Services Fees have created a difficult relationship with industry

2.99 The Program Review and 1995 National Marine Policy set the context for the Marine Services Fees charged to the commercial shipping industry for both marine navigational services and icebreaking. The fees are designed to recover a portion of the cost of certain navigational support services that are provided by the Canadian Coast Guard.

2.100 The fees for marine navigational services were put in place in 1996 but was revised in 1998 after consultations with industry. The icebreaking fee was implemented in 1998. The revised fee structure was designed to recover \$34.6 million annually, including the \$26.7 million for marine navigation services, \$6.7 million for icebreaking services, and \$1.2 million in associated administrative costs.

2.101 The revenue from the Marine Services Fees has not been sufficient to meet the \$34.6 million annual revenue target. This has led to shortfalls in the funding available for Coast Guard programs because its funding was reduced on the basis that the \$34.6 million annual revenue target would be met. Between 1996–97 and 2001–02, the Coast Guard has absorbed \$25.4 million in funding shortfalls within ongoing program activities.

2.102 The introduction of the Marine Services Fees has also had positive consequences. There has been a more realistic assessment of the number and

types of navigational aids that are required to support commercial shipping. The introduction of the fees has also motivated industry to become more actively involved in determining service levels.

2.103 Industry believes that the Marine Services Fees should be eliminated or, at least, minimized. Industry and the Coast Guard have collaborated on many issues over the last four years. However, industry still seems to believe that the Coast Guard cannot change enough to answer its concerns.

2.104 Most discussions between industry and senior Coast Guard officials are now dominated by industry concern for stability in the fee structure and a desire for the fees to be eliminated or decreased over time. The marine industry faces many challenges, including increased competition from other modes of transportation. While there are potential opportunities for the industry and the Coast Guard to work together to streamline existing navigational support services, the focus on the Marine Services Fees debate makes it difficult for them to co-operate.

Our Office has said this before

2.105 Chapter 13 of our 1983 Annual Report describes the results of an audit of Transport Canada's Marine Transportation Program. Many of the areas covered in this audit were also in our 1983 audit. While there have been many new technologies and services introduced since 1983, we are concerned about the similarity of today's management issues to concerns we expressed almost 20 years ago. The Appendix summarizes the key relevant observations from 1983.

Conclusion

2.106 Fisheries and Oceans Canada has a clear mandate to support safe and efficient marine navigation. Its roles and responsibilities within Canada's marine transportation system are well defined. There is a need to modernize and improve delivery of the Department's preventive responsibilities. The Department has recognized this need. It has various plans and initiatives to implement change. However, there are significant barriers to change, particularly

- failure to ensure that there is one national program,
- regional operations that are not held accountable for implementing national policies and meeting international obligations,
- key elements to ensure accountability are not present,
- inadequate integration of navigational support services,
- provision of a service that does not contribute to the mandate for safety and efficiency, and
- the *Navigable Waters Protection Act* is outdated and being used for unintended purposes.

2.107 The Department has not cost-effectively managed the functions we examined and changes have to be made to ensure the system meets user needs in the future.

2.108 We are concerned that the Department has not responded to issues that have been confronting the organization for many years. We believe that the Department must develop and implement an action plan to respond to the fundamental issues in this report.

Department's response. Fisheries and Oceans Canada accepts the Auditor General's findings and is committed to finding solutions. Although the Auditor General concludes that users of Canada's navigational support services generally consider that these services contribute to the delivery of safe and efficient waterways, the Chapter describes accurately the challenges and barriers that the Department faces in contributing to the delivery of safe and efficient waterways.

The Department recognizes many of the findings raised by the Auditor General and has started numerous initiatives in response to these findings. The legislative reform (such as regulations under the new *Canada Shipping Act*), development of results-based management and accountability frameworks, and Coast Guard Headquarters Renewal Initiatives are examples of such initiatives. The Department believes that the completion of these initiatives and the development of those described in response to the recommendations will provide the required framework to provide navigational support services in a more cost-effective manner.

The following paragraphs describe the action that the Department will take in response to the audit recommendations.

- Recommendation 2.53—The Canadian Coast Guard's Headquarters Renewal Initiative is now complete and Headquarters staff, in co-operation with their regional colleagues, will develop a plan to update all national policies and standards. Finally, the Coast Guard will develop a quality assurance function to regularly monitor the implementation of the policies, standards, and levels of services. These measures will be implemented over many years.
- Recommendation 2.68—The Coast Guard began the development of results-based management and accountability frameworks and will continue these efforts in 2003–04. Once fully developed, the Coast Guard plans to implement these frameworks on a national basis.
- Recommendation 2.73—The Coast Guard is developing a risk management policy framework and management tools on risk management in order to integrate risk management principles and concepts in the decisions making process. The Coast Guard is also in the process of developing risk assessment tools. These tools will be used to assess risks in selected waterways starting in 2003–04.
- Recommendation 2.77—As noted in the chapter, the Department has started a number of initiatives to modernize the delivery of its navigation support services and other Coast Guard services. The implementation of comprehensive risk-based methodology and completion of the business planning processes will ensure greater integration in service delivery. More detailed action plans with implementation dates will be completed.

- Recommendation 2.90—The Department will complete the review of the staffed light stations by 2003. In addition, the Department will continue the assessment of its entire light station portfolio and define specific measures for the disposal or rationalization of light stations that are not required for operational reasons.
- Recommendation 2.98—The Coast Guard will respond to this recommendation through the continuing development of its results-based management and accountability frameworks.

About the Audit

Objective

The objective of the audit was to assess the extent to which Fisheries and Oceans Canada's management of its preventive activities support its commitment to provide for safe and efficient waterways in a cost-effective manner.

Scope and approach

The audit focussed on the preventive aspects of the Department's activities supporting its commitment to provide for safe and efficient waterways. Broadly speaking, these activities relate to the navigational support services that fall within the Canadian Coast Guard's Marine Navigation Services (aids to navigation, channel maintenance, and navigable waters protection), and Marine Communications and Traffic Services business lines. The Canadian Hydrographic Service provides navigational charts, publications, digital and other navigational information. In addition, we examined the Office of Boating Safety's preventive responsibilities.

We did not examine the Department's search and rescue and environmental response activities in this audit. In addition, we did not examine the support for fishing harbours. Although icebreaking is an important part of the navigational support services, it has been excluded as it was largely covered in our 2000 Report, Chapter 31, Fleet Management.

We also did not examine maritime security in this audit. However, certain navigational support systems were examined because they play a role in supporting those departments and agencies that are responsible for maritime security.

Criteria

Given the above audit objective and scope, we expected the Department to do the following:

- Clearly define its mandate, including role and responsibilities, within Canada's marine transportation system, as it relates to supporting safe and efficient navigation in Canadian waterways.
- Specify the nature of activities and level of services necessary to fulfill its mandate, meet user needs, and ensure compliance with Canada's laws and international agreements.
- Establish expected outcomes for its key result commitment to safe and efficient waterways and report to Parliament on its results, including financial performance.
- Develop and implement strategies to manage its navigational support services and recreational boating safety responsibilities in a cost-effective manner.

Audit team

Assistant Auditor General: Ronald C. Thompson

Principal: John O'Brien

Directors: Gerry Chu and Kevin Potter

Glenn Doucette

Don MacNeill

Sandy Manels

Erin Windatt

For information, please contact Communications at (613) 995-3708 or 1-888-761-5953 (toll-free).

Appendix Key findings from our 1983 Report on the Canadian Coast Guard's preventive responsibilities

Management activity	Key findings
Determining levels of service	The Canadian Coast Guard has not adequately analyzed the needs of mariners and has not defined the extent and quality of services provided. As a result, the ability to plan and control Coast Guard activities is weakened.
Improved program efficiency	<p>Cost savings in the range of \$10 million to \$20 million annually are possible if the Coast Guard implements the following improvements in its activities:</p> <ul style="list-style-type: none"> • completes the lighthouse automation program started in 1970 but which has, in essence, been put on hold; • revises its standards for checking and maintaining buoys; • reassesses the continuing need and specific equipment requirements for some of its Vessel Traffic Service systems; and • increases the automation and consolidation of the Coast Guard radio stations.
Weaknesses in planning, operations, and the information used to manage marine programs	<p>There is insufficient overall analysis of need or assessment of which port would benefit most from Vessel Traffic Service systems. These systems were established in response to major marine incidents.</p> <p>The Coast Guard has not adequately reviewed the continuing need for each of its 272 lightstations, although, at an average annual operating cost of \$125,000 each, they are the most expensive aids it operates.</p> <p>The Coast Guard has not assessed the impact of adopting improved electronic aids such as radar, Loran-C, and racons on the more traditional aids such as lightstations or radio beacons.</p>
Performance measurement	In many areas such as buoys and lightstations, the Department lacks adequate cost information to allow managers to decide whether a given type of aid or a given district is being operated in the most efficient manner.
Risk assessment	<p>Marine safety is best achieved by following a comprehensive and co-ordinated program based on a systematic assessment of risk, and by carrying out an appropriate mix of activities, within resource limits, to minimize risk.</p> <p>Although the Department collects data on the marine incidents it investigates, it does not systematically analyse all these data to monitor relative levels of marine safety by type of traffic and degree of risk.</p>