Evaluation of the Marine Safety Program Activity

Final Report

Evaluation & Advisory Services
Transport Canada

November 2010
EXECUTIVE SUMMARY.......................................................................................................................... 9

KEY FINDING ............................................................................................................................... 9
RELEVANCE ................................................................................................................................. 9
PERFORMANCE .......................................................................................................................... 10
    Oversight ................................................................................................................................. 10
    Regulatory Framework .......................................................................................................... 11
    Economy and Efficiency ....................................................................................................... 11
RECOMMENDATIONS OF THIS REPORT ....................................................................................... 11

SECTION 1–BACKGROUND ................................................................................................................. 13
    1.1 PROFILE OF THE MARINE SAFETY PROGRAM ................................................................. 13
        Program description ........................................................................................................... 13
        Program delivery .............................................................................................................. 15
        Resources ............................................................................................................................ 15
        Stakeholders ..................................................................................................................... 16
        Logic Model ...................................................................................................................... 17
    1.2 EVALUATION APPROACH ............................................................................................... 18
        Design considerations .......................................................................................................... 18
        Lines of evidence .............................................................................................................. 18
        Scope and limitations ......................................................................................................... 20

SECTION 2–EVALUATION FINDINGS: PERFORMANCE ......................................................................... 21
    2.1 THE SAFETY PERFORMANCE OF THE MARINE SECTOR (ULTIMATE OUTCOMES) .......... 21
        A safe marine transportation system ................................................................................ 21
    2.2 OVERSIGHT SUB-ACTIVITY (INTERMEDIATE OUTCOMES) ............................................ 27
        Inspections ......................................................................................................................... 27
        Training and Certification ................................................................................................. 38
    2.3 REGULATORY FRAMEWORK SUB-ACTIVITY (IMMEDIATE OUTCOMES) ......................... 43

SECTION 3–EVALUATION FINDINGS: ECONOMY AND EFFICIENCY ............................................ 48
    3.1 DISTRIBUTION OF INSPECTION EFFORT ......................................................................... 48
    3.2 USE OF THIRD-PARTY INSPECTIONS ............................................................................. 50
    3.3 TRENDS IN COST-RECOVERY ....................................................................................... 54

SECTION 4–CONCLUSIONS ............................................................................................................... 56
    Relevance ............................................................................................................................. 56
    Performance (achievement of expected outcomes) ............................................................. 57

SECTION 5 – RECOMMENDATIONS AND MANAGEMENT ACTION PLAN ........................................... 62
    5.1 RECOMMENDATIONS ...................................................................................................... 62
    5.2 MANAGEMENT ACTION PLAN ...................................................................................... 63
List of Abbreviations

ABS  American Bureau Shipping
AC  Assurances of Compliance
ACES  Automated Certification and Examination Database
AMP  Administrative Monetary Penalty
BAR  Boating Accident Report
BWWG  Ballast Water Working Group
CACP  Canadian Alternative Compliance Program
CCG  Canadian Coast Guard
CDSR  Cabinet Directive on Streamlining Regulation
CFIA  Canadian Food Inspection Agency
Civ Av  Civil Aviation
CMAC  Canadian Marine Advisory Council
CMD  Canadian Maritime Documents
CSA  Canada Shipping Act
CSA 2001  Canada Shipping Act, 2001
DES  Departmental Evaluation Services
DFO  Department of Fisheries and Oceans Canada
DPR  Departmental Performance Report
DSIP  Delegated Statutory Inspection Program
DSM  Domestic Safety Management
EU  European Union
FPT  Federal/Provincial/Territorial
FSC  Flag State Control
GT  Gross Registered Tonnage
HQ  Headquarters
IACS  International Association of Classification Societies
ICAO  International Civil Aviation Organization
ILO  International Labor Organization
IMO  International Maritime Organization
ISM code  International Safety Management Code
MAF  Management Accountability Framework
MARPOL  International Convention for the Prevention of Pollution from Ships
MOU  Memorandum of Understanding
MS  Marine Safety (synonymous with TCMS)
MSI  Marine Safety Inspectors
TCMS  Marine Safety Program
NASP  National Ariel Surveillance Program
NRBAC  National Recreational Boating Advisory Council
NTARS  National Time and Activity Recording System (MS database)
NTP  National Training Program
OBS  Office of Boating Safety
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAA</td>
<td>Program Activity Architecture</td>
</tr>
<tr>
<td>PMF</td>
<td>Performance Measurement Framework</td>
</tr>
<tr>
<td>PSC</td>
<td>Port Side Control</td>
</tr>
<tr>
<td>PCOC</td>
<td>Pleasure Craft Operator Card</td>
</tr>
<tr>
<td>RAF</td>
<td>Risk Assessment Framework</td>
</tr>
<tr>
<td>RIAS</td>
<td>Regulatory Impact Analysis Statement</td>
</tr>
<tr>
<td>RMAF</td>
<td>Results-based Management Accountability Framework</td>
</tr>
<tr>
<td>RO</td>
<td>Recognized Organization</td>
</tr>
<tr>
<td>RPP</td>
<td>Report on Plans and Priorities</td>
</tr>
<tr>
<td>RRBAC</td>
<td>Regional Recreational Boating Advisory Council</td>
</tr>
<tr>
<td>SI-7</td>
<td>Steamships Inspection Note</td>
</tr>
<tr>
<td>SIRS</td>
<td>Ship Inspection Reporting System</td>
</tr>
<tr>
<td>SMS</td>
<td>Safety Management Systems</td>
</tr>
<tr>
<td>SO</td>
<td>Strategic Outcome</td>
</tr>
<tr>
<td>SOLAS</td>
<td>Safety of Life at Sea</td>
</tr>
<tr>
<td>STCW</td>
<td>Standards of Training, Certification and Watchkeeping</td>
</tr>
<tr>
<td>SVMIP</td>
<td>Small Vessel Monitoring Inspection Program</td>
</tr>
<tr>
<td>TATC</td>
<td>Transportation Appeal Tribunal of Canada</td>
</tr>
<tr>
<td>TC</td>
<td>Transport Canada</td>
</tr>
<tr>
<td>TCC</td>
<td>Transport Canada Center</td>
</tr>
<tr>
<td>TCMS</td>
<td>Transport Canada Marine Safety (synonymous with MS)</td>
</tr>
<tr>
<td>TMX</td>
<td>Transport Executive Management Committee</td>
</tr>
<tr>
<td>TOR</td>
<td>Terms of Reference</td>
</tr>
<tr>
<td>TP</td>
<td>Transport Publication</td>
</tr>
<tr>
<td>TSB</td>
<td>Transportation Safety Board of Canada</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
</tbody>
</table>
List of Figures

Figure 1: Logic model derived from the Program Activity Architecture ........................................ 17
Figure 2: Number of shipping accidents and accidents aboard ship, 1977–2006 .......................... 23
Figure 3: Vessels involved in shipping accidents, 2003–2007 .................................................... 25
Figure 4: Perceived level of seafarers’ awareness of regulations as it affects their work .......... 41
Figure 5: Average inspection times by tonnage for delegated and non-delegated inspections ......................................................................................................................... 51
Figure 6: Level of confidence that inspections carried out by others will ensure the safety of personnel and vessels ........................................................................................................... 54
List of Tables

Table 1: Marine Safety performance indicators and targets .................................................. 14
Table 2: Overview of Marine Safety resources as deployed by Program sub-activities included in the evaluation .................................................................................................... 16
Table 3: Fatalities as a result of shipping accidents, 1997-2008 .............................................. 22
Table 4: Marine injuries, 1997–2008 ...................................................................................... 22
Table 5: Canadian flag commercial shipping accident rates .................................................. 23
Table 6: Foreign flag commercial shipping accident rates ..................................................... 24
Table 7: Recreational boating deaths, 2006 .......................................................................... 26
Table 8: Public confidence in marine transportation ................................................................ 26
Table 9: Summary of annual Port State Control (PSC) ship inspections .............................. 29
Table 10: Summary of annual Flag State Control (FSC) ship inspections ............................ 30
Table 11: Correlation of inspections and accidents for vessels in SIRS database, .................... 31
Table 12: Compliance rate of ships inspected by Port Warden ............................................. 32
Table 13: Percentage compliance of small commercial vessels, 2001-2009 ............................ 32
Table 14: Inspection requirements for selected vessel classes under former CSA ................ 33
Table 15: Sample of SI-07s by type of defect from October 2007 to December 2008 .......... 35
Table 16: Number of certificates issued by year and total candidates ................................... 39
Table 17: Total Pleasure Craft Operator Cards issued .......................................................... 42
Table 18: Regulatory policy requirements by whether or not met ........................................ 45
Table 19: Summary of inspection effort and shipping accidents, ........................................ 49
Table 20: Accident rate compared to inspection rate for small and other fishing vessels, October 2007–December 2008 ........................................................................... 49
Table 21: Marine Safety cost recovery based on fees (in $1,000s) ....................................... 54
Table 22: TCMS safety targets and whether they were met ............................................... 57
Executive Summary

This evaluation assesses the relevance and performance of Transport Canada’s Marine Safety Program Activity (TCMS). This is the first time that TC’s Evaluation and Advisory Services (EAS) has undertaken an evaluation of this Program Activity. However, one evaluation, three internal and one external audit of various aspects of the Marine Safety Program were completed between 2004 and 2007.

The Program was evaluated from a high-level perspective. While all major sub-activity areas of the Program Activity Architecture (PAA) related to Marine Safety such as regulatory reform and compliance were covered, the evaluation did not address each of these areas to an equal degree. The evaluation also did not address those activities of Marine Safety that deal with protection of the marine environment, which will be covered by a planned evaluation of the Clean Water from Transportation program activity scheduled for 2011–2012.

The evaluation used a theory-driven design to assess the extent to which activities conducted by TC under two sub-activities defined by the TCMS have resulted in the outcomes set out The Next Wave–Marine Safety Strategic Plan 2003–2010. The focus of the evaluation was on the two sub-activities that make up TCMS, namely the Marine Safety Oversight sub-Activity and the Marine Safety Regulatory Framework sub-activity.

KEY FINDING

Transportation Safety Board (TSB) data shows that the marine safety in Canada has been improving over the past decade. There is a consistent downward trend in the number of commercial shipping accidents (both Canadian and foreign vessels) and marine fatalities decreased significantly since 1997, both reaching historical lows in the last five years. Evaluation findings suggest that the Marine Safety Oversight activity has contributed to this trend. The effectiveness of the new Regulatory Framework will have to be measured against its capacity to generate further improvements, especially with small vessels and fishing vessels.

Relevance

There is little doubt that the activities evaluated remain relevant. The British North America Act of 1867 assigned the federal government responsibility for safe navigation and shipping. Today, the principal legislation governing safety in marine transportation and recreational boating is the Canada Shipping Act, 2001 (CSA 2001). In general, the Act mandates that the Minister of Transport protect the health and safety of individuals who participate in marine transport and commerce. TCMS is responsible for fulfilling the Minister’s mandate when it comes to both oversight of safety and implementation of the regulatory framework set out in CSA 2001. On July 1, 2007, the first set of regulations associated with CSA 2001 came into full force.

Legal authority to address safety in marine transportation, commerce, recreational boating, and the marine environment in general is mandated to TC. The Marine Safety Program supports TC’s operational priority of strengthening transportation safety, as outlined in the 2009/10 Report on Plans and Priorities (RPP).
Evaluation findings demonstrate that there is a continuing need to improve the safety of the marine transportation system to achieve departmental objectives and targets. Findings also suggest that the program should place a greater focus on small vessels and fishing vessels when it comes to marine safety.

Data shows that recreational boating sector accounts for more deaths than commercial boating. Information gathered during the evaluation suggests that due to problems in obtaining up-to-date data on deaths from recreational boating, TCMS has not set targets to address the frequency of such deaths.

**Performance**

The safety performance of the marine sector is measured against targets set in 2003. Based on reports from the TSB, the evaluation shows that the average number of marine fatalities has been reduced by 36 per cent between 1998-2002 and 2003-2008, exceeding the 20 percent reduction target. The target of a 20 per cent reduction in the five-year average accident rate for foreign flag vessels has also been reached. The five-year average for the Canadian flag commercial accident rate was not reduced as expected, as only an eight per cent reduction could be observed, missing the target by 12 percent. Finally, a reduction of only four per cent could be observed in the number of reported marine injuries whereas the targeted level of reduction was 30 per cent.

Data shows that fishing vessels are involved in five times as many shipping accidents than other types of commercial shipping vessel. In particular, marine safety among small vessels (less than 15 tons) and fishing vessels is of particular concern – a conclusion also reached by TSB. Small fishing vessels have the country’s highest rate of serious marine accidents, with more than 200 reported yearly. It is clear to us that the current trend toward a steady reduction in marine fatalities and commercial marine accidents could only be maintained or improved upon by focusing on the safety performance of fishing vessels and small vessels.

The evaluation tried to establish the extent to which these trends are related to the results achieved under the oversight and regulatory program activities.

**Oversight**

To assess oversight, the evaluation focused mainly on results achieved on compliance with regulations through the analysis of inspection results. Performance information on compliance did not allow the evaluation to determine whether there was a causal link between the program activities and the safety performance of the sector. Nevertheless, the data collected for the Port State Control inspection regime showed congruent trends between the improvement of compliance and the reduction of marine accidents for foreign flag vessels. The percentage of ships for which deficiencies were detected through Port State Control fell from 53 per cent in 2001 to 38 per cent in 2007. During the same period, the percentage of vessels detained as a result of PSC inspection decreased from eight per cent to four per cent.

The compliance information collected for Flag State Control, the domestic inspection regime, showed a dramatic increase of non-compliance between 2004 and 2008. However, Steamship
Inspection Notes (SI-7s) were the only measure of compliance available for this evaluation, and they proved unreliable. Changes in inspection work processes and changes to the way TCMS records data on deficiencies (SI-7s) may have masked real rates of compliance as well as the actual number of deficiencies. TCMS intends to improve the way it tracks deficiencies under Flag State Control with the coming into force of the Administrative Monetary Penalties (AMP) Regulations. The need to give quality to the deficiency data will be important regardless of the type of system being used. Without adequate deficiency data TCMS would be unable to effectively report on a key expected result of its Oversight Program, the level of industry compliance with the regulatory framework.

**Regulatory Framework**

TCMS’ regulatory reform project met, and in some cases exceeded, the requirements of government central agencies. Information gathered also shows that the new regulatory framework is being aligned with international conventions and protocols. It is however too early to assess the impact of the new regulations on the overall safety performance of the sector.

**Economy and Efficiency**

In the economy and efficiency section, the evaluation focused on the extent to which TCMS made the best use of its resources to achieve its outputs and outcomes. To this end, we looked at issues such as the use of third-party inspections and the distribution of inspection effort and examined whether TCMS made use of the most efficient and effective approaches to achieving its objectives.

Some of the inspection activity is delegated to classification societies in accordance with signed agreements between TCMS and these organizations. Our analysis showed that the monitoring effort by TCMS inspectors for delegated vessels (measured as hours of TCMS inspectors’ time) was found to be considerably less on average than the inspection effort for similar, non-delegated vessels—62 hours less. However, we believe this finding should be viewed in the context of other evidence suggesting that, beyond the narrowly defined inspection hours spent on monitoring of delegated vessels, DSIP may have initially strained the inspection resources of certain regions.

With respect to the distribution of inspection effort, while we took into account the important fact commercial vessels under 15 tons (with some exceptions) were not required to be inspected, our analysis showed that smaller vessels do not seem to have received an inspection effort commensurate with their share of accidents.

**Recommendations of this report**

- ADM / Safety and Security should improve the way TCMS documents, categorizes and analyses deficiencies under Flag State Control to enhance capacity to identify and target risk.

- ADM / Safety and Security should ensure that TCMS focuses greater attention on fishing vessel and small vessel safety in order to maintain or improve the trend of a steady reduction in marine fatalities and commercial marine accidents.
• ADM / Safety and Security should ensure that TCMS adopts a systematic approach to providing
  - Refresher training to inspectors that have been in the job for a while
  - Specialized training that focuses on the specifics of an inspector’s job (such as offshore drilling)

• ADM / Safety and Security should ensure that there is stronger and more consistent direction from HQ with respect to delegated activities and that effective monitoring takes place in future iterations of such activities.

• ADM / Safety and Security should ensure that a review of TCMS’ inspection fees is conducted with a view to finding ways to bring them closer to market rates for similar services.
Section 1–Background

In 2008, the Transport Canada evaluation unit committed to evaluate all major safety initiatives, including the Marine Safety Program Activity. With the adoption of a new Program Activity Architecture (PAA) in 2009 and the requirement for expanded evaluation coverage of Departments’ direct program spending, this evaluation was reframed as a strategic evaluation of two sub-activities of the Marine Safety Program Activity, namely:

- the Marine Safety Regulatory Framework (sub-activity 3.2.1), and
- the Marine Safety Oversight (sub-activity 3.2.2).

Prior to this evaluation, regulatory and oversight activities in the marine sector had never been evaluated by Transport Canada. In recent years, audits of certain parts of the Program were conducted either by TC Audit and Advisory Services or by international organizations, as follows:

- International Marine Organization (IMO)–Audit of Canada (June 2007)
- Quality of Information Audit–Departmental Audit and Advisory Services (2007)
- Audit of Inspection Standardization Practices–Departmental Audit and Advisory Services (September 2006)
- Assessment of the extent to which Transport Canada (TC) has tracked Program activities and results under the International Convention for the Prevention of Marine Pollution (MARPOL) –Departmental Audit and Advisory Services (2004, 2006)

1.1 Profile of the Marine Safety Program

Program description

The logic model presented at the end of this section provides the rationale for the order in which we describe the Marine Safety Program’s activities and sub-activities here.

The Marine Safety Regulatory Framework sub-activity: According to the Program description in the 2009–10 Departmental Program Activity Architecture (PAA), this sub-activity operates using a mix of tools—policies, guidelines, regulations and standards—based on performance and risk, to:

- Support the safety of seafarers, commercial vessels and pleasure crafts
- Harmonize Canada’s marine safety framework with other jurisdictions, and
- Support pilotage services in Canada.

1 The Contribution to the Canadian Safe Boating Council and the Canadian Red Cross was evaluated in 2006
2 File number: 1577-04-012
According to the departmental performance measurement framework, the Regulatory Framework sub-activity is expected to result in “a risk-based regulatory framework that is consistent with Cabinet Directives on streamlining of regulations and international conventions.”

**The Marine Safety Oversight sub-activity**: This sub-activity involves monitoring of the commercial vessel industry and of compliance with the marine safety regulatory framework. To exercise oversight, Transport Canada:

- Inspects commercial vessels entering Canadian waters
- Issues certificates and other official documents to Canadian seafarers (officers and crews on Canadian vessels)
- Approves seafarer training
- Registers and licenses commercial vessels and pleasure crafts
- Issues safety certificates and approvals for vessels, equipment and design
- Responds to marine occupational safety and health issues
- Conducts surveillance and investigations, and
- Promotes safe practices.

The Marine Safety Oversight Program is expected to achieve two key results:

- Compliance with the regulatory framework, and
- Adoption of a strong safety culture by the marine community.

**Marine Safety Program Activity**: Results achieved through the regulatory framework and oversight sub-activities are expected to contribute to the achievement of the ultimate outcomes of the Marine Safety Program Activity, which are:

- A safe marine transportation system (safety), and
- Public confidence in the marine transportation system.

TCMS measures the safety of the marine transportation system in terms of marine fatalities, reported marine injuries, domestic accident rates and foreign ships accident rate. Performance targets for these indicators have been defined in *The Next Wave–Marine Safety Strategic Plan 2003–2010*, adopted by TC in 2003, as shown in Table 1.

<table>
<thead>
<tr>
<th>Safety Indicators</th>
<th>5-year average (1998–2002)</th>
<th>Target 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of marine fatalities</td>
<td>34</td>
<td>20% reduction of 1998–2002 average</td>
</tr>
<tr>
<td>Number of reported marine</td>
<td>81.2</td>
<td>30% reduction of 1998–2002 average</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Safety Indicators</th>
<th>5-year average (1998–2002)</th>
<th>Target 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>injuries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canadian flag commercial accident rate (per 1,000 trips)</td>
<td>3.7</td>
<td>20% reduction of 1998–2002 average</td>
</tr>
<tr>
<td>Foreign flag commercial accident rate (per 1,000 trips)⁴</td>
<td>2.0</td>
<td>20% reduction of 1998–2002 average</td>
</tr>
</tbody>
</table>

*Source: TCMS*

**Program delivery**

The Program is delivered through headquarters (HQ), situated in Ottawa, and five regional offices (Atlantic, Quebec, Ontario, Prairie-Northern and Pacific). In addition, 34 Transport Canada Centers (TCC) provide marine services across the country. These centres were set up to ensure that services are delivered as close as possible to clients.

The roles and responsibilities of HQ and the regions have evolved significantly since the mid-1990s. HQ’s main focus has shifted to the development of marine related regulations, policies and standards and away from technical and operational functions, which are now undertaken predominately by the regional offices. Regional responsibilities include inspection services, technical services, compliance and enforcement activities, and certification of seafarers. The five main branches in HQ are:

- Regulatory Services and Quality Assurance
- Program and Technical Training Services
- Personnel Standards and Pilotage
- Operations and Environmental Programs
- Design, Equipment and Boating Safety.

**Resources**

Table 2 provides an overview of how Marine Safety Program Activity resources have been deployed since 2004 for the Program sub-activities included in this evaluation.

---

⁴ This accident rate is the number of shipping accidents by Canadian or foreign flag commercial vessels of 15 Gross Registered Tonnage (GRT) or more, excluding passenger and fishing vessels, involved in domestic and international trade, as reported to the TSB.
Table 2: Overview of Marine Safety resources as deployed by Program sub-activities included in the evaluation

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regulatory Framework</strong></td>
<td>N/A</td>
<td>4,394,628</td>
<td>4,957,400</td>
<td>4,084,164</td>
<td>5,044,104</td>
<td>8,482,446</td>
</tr>
<tr>
<td>Salary - M1A</td>
<td>N/A</td>
<td>2,108,714</td>
<td>2,284,514</td>
<td>2,309,643</td>
<td>2,444,907</td>
<td>6,066,969</td>
</tr>
<tr>
<td>Other Operating – M1B</td>
<td>N/A</td>
<td>2,175,396</td>
<td>2,681,807</td>
<td>1,541,587</td>
<td>1,936,848</td>
<td>2,288,377</td>
</tr>
<tr>
<td>Capital – M20</td>
<td>N/A</td>
<td>119,450</td>
<td>N/A</td>
<td>247,660</td>
<td>662,349</td>
<td>127,100</td>
</tr>
<tr>
<td><strong>Oversight</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salary – M1A</td>
<td>53,832,566</td>
<td>40,104,487</td>
<td>39,812,280</td>
<td>41,116,895</td>
<td>43,083,884</td>
<td>38,358,099</td>
</tr>
<tr>
<td>OOC – M20</td>
<td>18,678,930</td>
<td>20,020,117</td>
<td>20,324,990</td>
<td>20,278,697</td>
<td>24,949,428</td>
<td>15,997,869</td>
</tr>
<tr>
<td>Revenue – M12</td>
<td>-8,471,351</td>
<td>-8,638,452</td>
<td>-8,059,252</td>
<td>-8,364,023</td>
<td>-8,004,836</td>
<td>-7,700,000</td>
</tr>
<tr>
<td>Capital – M20</td>
<td>3,410,398</td>
<td>7,382,771</td>
<td>1,967,745</td>
<td>4,733,499</td>
<td>2,014,613</td>
<td>3,929,300</td>
</tr>
<tr>
<td>Contributions – M30</td>
<td>192,000</td>
<td>144,000</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>250,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>53,832,566</td>
<td>62,650,491</td>
<td>59,012,554</td>
<td>63,958,930</td>
<td>67,087,194</td>
<td>62,795,775</td>
</tr>
</tbody>
</table>

Source: TCMS

For the fiscal year 2008–2009, 655.1 Full-Time Equivalents (FTEs) were budgeted for the Marine Safety Program.

**Stakeholders**

TCMS provides direct services to all segments of both domestic and foreign marine industries. As well, the Program partners with industry associations, labour unions, special interest groups, professional organizations, classification societies, other maritime administrations, federal and provincial governments and other areas of TC to effectively regulate and oversee commercial and non-commercial marine activities in Canada. Other partners include international organizations, independent standards development bodies, universities, and research and development (R&D) agencies.

The general public, although not a direct client, benefits in many indirect ways from the Program’s services.

TCMS also influences the marine safety environment of domestic and foreign vessels entering and departing Canadian waters, through its involvement in international marine conventions.

---

5 This table is constructed based on 2009–2010 PAA codes and excludes Clean Water activities and Divestiture of Training Assets funding. PAA codes changed three times between 2004–05 and 2009–2010; this may create inconsistencies in some of the numbers in the Table. Further, there were no specific PAA codes for the Regulatory Framework in 2004–05; these activities are included in Oversight. Finally, Regulatory Framework has a new definition in 2009-10; it now includes policies and standards.

6 Planned.
Logic Model

As part of this evaluation, a high-level logic model was developed to reflect the chain of activities and results that are expected to lead to the achievement of the Marine Safety Program’s objectives (see Figure 1).

The logic of the Program is as follows: safety of the marine transportation system will result from compliance with regulatory framework and the adoption of a strong safety culture (see Figure 1). Both compliance and development of a strong safety culture in the marine sector requires the development and implementation of a risk-based regulatory framework. In the 2009 PAA, “oversight” and “regulatory framework” were both defined as sub-activities of TCMS and are both expected to directly contribute to the Program Activity’s expected results of a “safe marine transportation system.” However, the development of the regulatory framework should be considered a logical precondition to oversight activities and to adoption of a strong safety culture by the community, and therefore could not be considered an immediate outcome at the same level as outcomes expected from the Oversight sub-activity, such as compliance. It should rather be thought of as an output, or even as an input, to the entire process. Without suggesting formal changes to the PAA, this evaluation is based on the assumption that the regulatory framework sub-activity logically precedes the others.

Figure 1: Logic model derived from the Program Activity Architecture

<table>
<thead>
<tr>
<th>Immediate outcomes</th>
<th>Intermediate Outcomes</th>
<th>Ultimate outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Regulatory Framework)</td>
<td>(Oversight )</td>
<td>(Marine Safety)</td>
</tr>
<tr>
<td>A risk-based regulatory framework that is consistent with Cabinet Directives on streamlining of regulations and international conventions</td>
<td>Compliance with the regulatory framework</td>
<td>A safe marine transportation system</td>
</tr>
<tr>
<td></td>
<td>A strong safety culture in the marine community</td>
<td>Public confidence in the marine transportation system</td>
</tr>
</tbody>
</table>
1.2 Evaluation approach

Design considerations

The evaluation is based on a theory-driven design. As such, it aims to assess the extent to which the activities conducted by the Department under the umbrella of the Marine Safety Program Activity have resulted in the expected measurable outcomes.7

The evaluation’s objectives were defined as follows:

- Determine the extent to which activities carried out by the Program to date have had the expected results and contributed to the achievement of objectives set out in 2003; and
- Establish a baseline against which results expected from the implementation of the new regulatory framework could be measured five years from now.

Detailed and accurate data on the principal marine safety indicators were available from an independent source, the Transportation Safety Board (TSB). This provided the evaluation team with reliable information to assess the overall “success” of the Program in meeting its objectives. Therefore, our analysis began by considering the Program’s final outcomes (reduction of marine fatalities, marine injuries, accident rates.). We then examined how the regulatory framework and oversight sub-activities might have impacted the overall level of safety. Specifically, the evaluation focused on how activities such as the inspection of commercial vessels and training/awareness (for recreational boaters and seafarers) contributed to the overall level of marine safety in Canada. This analysis relied mostly on the observation of results achieved regarding compliance with regulations and implementation of risk-based regulatory framework. However, because of a lack of usable information in Marine Safety databases, the overall analysis remained qualitative in nature. It was not possible to establish statistically whether the results could be directly attributed to Program activities.

Lines of evidence

In support of our design approach, the evaluation team made use of multiple lines of evidence and made use of the following methods to gather primary and secondary data.

Literature and Program Document Review: The relevant literature and program documents were a key source of qualitative information and secondary data. Our review included:

---

7 During the planning phase of this project, two other approaches were considered. First, we considered assessing the outcomes of different activities and then comparing their cost-effectiveness on the basis of delegated versus departmental inspections, or inspections versus outreach and safety promotion. This type of analysis would have demanded complete and detailed sets of data to be successful and the data available to us was insufficient to carry out the multivariate analysis required. A second approach that we considered would have isolated the impact of the implementation of the new Canada Shipping Act (2001) on safety performance through a “before-and-after” evaluation design. Because the first set of major regulatory changes based on the new legislation only came into force in July 2007, we determined that sufficient performance information did not exist to allow for such a comparison.
• Scientific literature and studies
• Audits, evaluations, and other reviews
• Pertinent laws, regulations
• Policies, standards, procedures and work instructions
• Strategic documents
• Formal and informal progress reports and planning documents
• Briefing notes
• Presentations

• **Database Review:** We reviewed statistical and financial data provided in four TCMS databases:
  - Ship Inspection Reporting System (SIRS)
  - National Time and Activity Recording System (NTARS)
  - Automated Certification and Examination System (ACES)
  - Small Vessel Inspection System (SVIS).

Information from these databases was primarily used to conduct analysis of industry compliance under the domestic and foreign-flag inspections regimes. We also reviewed and used TSB data to depict the overall safety performance of the marine sector.

• **Site Visits:** We visited all five regions (Atlantic, Quebec, Ontario, Prairie, Northern and Pacific), including regional satellite offices, to observe operations ranging from inspections of vessels to environmental response activities. We also interviewed regional managers and staff to gain a better understanding of regional offices’ roles and responsibilities and to obtain regional perspectives on various marine safety issues.

• **Media Review:** We undertook an analysis of media coverage of marine safety, including reporting on accidents. The primary source was TC’s Weekly Media Analysis, where each week a scan of the previous week's national media coverage of Transport-related issues, including issues relating to marine safety, is produced.

• **Observation:** Evaluation team members attended three Canadian Marine Advisory Council (CMAC) meetings (April 2008, November 2008 and April 2009) -an organization TCMS works with extensively to inform policy development- to observe consultations related to regulatory reform.

• **Survey of Stakeholders:** We deployed our survey during November 2008 CMAC, which includes representatives from all sectors of the industry, including associations, marine schools and unions. It can therefore be considered a fairly representative sample of the marine safety stakeholders. Our survey obtained feedback from CMAC 44 members. Survey results were mostly used to document satisfaction with the consultation process.

• **Survey of Staff:** Using the CMAC forum, we obtained feedback from 98 Marine Safety staff working in various areas and regions (inspection services, design, equipment and boating safety, standards, etc.) Information from this survey was used primarily to document aspects of performance for which no other sources were available or to refine lines of inquiry.

• **Interviews:** We conducted 32 in-depth interviews with the TCMS Directorate, regional managers, staff (mainly inspectors) and stakeholders to validate findings stemming from the surveys, database and literature reviews. Interviews covered various aspects of the oversight and the regulatory activities of the Marine Safety Program. Results were analyzed and reported as qualitative information and used mostly to support or explain findings from other lines of inquiries.
Scope and limitations

The overall design of the evaluation study is qualitative. In the absence of the required information to establish clear attribution between “compliance” and “safety performance”, evaluation conclusions regarding the effectiveness of the program are based on a qualitative assessment of the likelihood that observed trends in compliance are related to safety performance. As such, conclusions regarding the effectiveness of the program do not have the same degree of robustness as those that would have been arrived at through a statistically valid demonstration of attribution. Nevertheless, conclusions and recommendations regarding the allocation of efforts towards small vessels and fishing vessels are general enough to remain valid despite these limitations.

The evaluation was conducted from a high-level perspective. While all major sub-activity areas of the PAA related to MS were covered in the evaluation, such as regulatory reform, inspections, and training, the evaluation did not address each of these areas to an equal degree. For example, with respect to inspection activities, the evaluation did not examine Port Warden inspection activities as extensively as other types of inspection activities, including delegated inspections. As well, a majority of the Education and Awareness activity area—such as safety and environmental awareness materials and sessions under the Office of Boating Safety (OBS) and information provided to external stakeholders—was not included in the evaluation design. Some of this analysis was covered by an evaluation of OBS conducted in 2006; it will also be included in an evaluation of funding in support of boating safety that is planned for 2012–2013.

The evaluation also did not address those activities of Marine Safety that deal with protection of the marine environment. Most of these activities will be covered by a planned evaluation of the Clean Water from Transportation program activity scheduled for 2011–2012.

When the planning and design phase of this evaluation began, TC had not yet implemented its 2009–10 PAA. In doing so, the Departmental Strategic Outcomes (SOs) were amended and the PAA was redesigned. Given that the current PAA forms the basis for how TC manages and allocates resources, the evaluation’s scope had to be adjusted in two important ways in order to ensure that:

- the outcomes identified in the evaluation and in the PAA were aligned, and
- the evaluation recommendations were well-aligned with the Marine Safety Program’s current status.

The main challenge we encountered was that during the timeframe covered by this evaluation, Transport Canada was making major changes to regulations regarding marine safety, as CSA 2001 came into force in July 2007. Consequently, there was little information on results specific to the new framework. However, this turns out to be a possibility to ensure a good baseline measurement against which the new regulations could be assessed in the future.
Section 2–Evaluation Findings: Performance

Our evaluation approach requires us to first consider the overall safety performance of the marine sector measured in terms of marine fatalities, marine injuries, and accident rates. Other relevant data presented by the TSB is also examined. The evaluation then looks at whether this overall safety performance could have been influenced by the performance of Oversight and Regulatory Framework sub-activities. Ideally, it should be possible to establish a causal link between the safety performance of the sector and the intermediate outcomes to be achieved by the program, such as compliance and the implementation of a risk-based regulatory framework.

In keeping with this approach, we begin this section by presenting findings on the safety performance of the marine sector. We then examine the outcomes of various components of the Oversight sub-activity, e.g. inspections and training, and of the Regulatory Framework sub-activity.

Considering that the analysis of relevance has to factor in the overall situation in terms of safety, evaluation findings and conclusions regarding the relevance of the program activity are presented at the end the report, in the conclusion section.

2.1 The Safety Performance of the Marine Sector (Ultimate Outcomes)

The Department has identified two expected results at the level of the Marine Safety Program Activity:

- a safe marine transportation system; and
- public confidence in the marine transportation system.

A safe marine transportation system

In The Next Wave–Marine Safety Strategic Plan 2003–2010, TCMS identified four indicators to measure overall safety in the marine sector:

- Number of marine fatalities
- Number of reported marine injuries
- Canadian flag commercial accidents rate
- Foreign flag commercial accident rate.

These indicators and the associated targets have been included in the Department’s Performance Measurement Framework.
Between 1997 and 2008, the number of marine fatalities decreased significantly and reached a historic low of 14 in 2007.

Table 3 shows the annual marine fatalities between 1997 and 2008. Data for 2009 was not available when the evaluation research was conducted. The 1998–2002 five-year average was 34.0 fatalities (taking into account 1998, an apparent outlier year, with 48 fatalities). The 2003–2008 six-year average was 20.2. The difference amounts to a 40 per cent reduction. If 1998 is replaced with 1997, the 1998–2002 average becomes 29.2, which amounts to a 31 per cent reduction in fatalities. At any rate, the target of a 20% reduction has been surpassed.

### Table 3: Fatalities as a result of shipping accidents, 1997-2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>marine fatalities</td>
<td>24</td>
<td>48</td>
<td>29</td>
<td>31</td>
<td>34</td>
<td>28</td>
<td>17</td>
<td>28</td>
<td>20</td>
<td>18</td>
<td>14</td>
<td>24</td>
</tr>
</tbody>
</table>

Source: TSB Marine Statistics

* Includes fatalities from accidents aboard ship. Also includes fatalities resulting from both Canadian and foreign flag vessel accidents.

There has been no real progress in reducing the number of reported marine injuries between 1997 and 2008.

Table 4 presents the number of marine injuries per year between 1997 and 2008. TCMS set a target to reduce reported injuries by 30 per cent from the 1998–2002 five-year average by the year 2010. These data suggest this target will not be reached. The 1998–2002 five-year average for the number of marine injuries was 81.2. The 2003–2008 six-year average was 77.7, which amounts to a very low reduction (four per cent).

### Table 4: Marine injuries, 1997–2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>marine injuries*</td>
<td>84</td>
<td>80</td>
<td>84</td>
<td>94</td>
<td>70</td>
<td>78</td>
<td>95</td>
<td>81</td>
<td>66</td>
<td>79</td>
<td>80</td>
<td>65</td>
</tr>
</tbody>
</table>

*Includes injuries from accidents aboard ship. Also includes injuries resulting from both Canadian and foreign flag vessel accidents.

8 The evaluators note that the yearly figures from Table 4 may be too low and may not capture the large numbers of marine injuries that are officially reported to provincial compensation boards. The evaluation used TSB figures to maintain consistency. However, according to TCMS representatives, Canadian Association of Workers Compensation Boards, together with relevant information from Human Resources and Skills Development Canada – Labour Program, maintain accident statistics that more accurately depict the rates of accidents on board vessels in Canada.
The target set for the reduction in the Canadian flag commercial shipping accident rate has not been reached.

Table 5 shows commercial shipping accidents rates\(^9\) from 1998 to 2008 for Canadian flagged vessels. The five-year average of 3.7 for 1998–2002 decreased to a six-year average of 3.4 between 2003 and 2008, constituting an eight per cent reduction instead of the targeted 20 per cent reduction.

<table>
<thead>
<tr>
<th>Year</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident rate per 1,000 trips*</td>
<td>3.5</td>
<td>4.9</td>
<td>3.1</td>
<td>3.9</td>
<td>3.3</td>
<td>3.3</td>
<td>3.8</td>
<td>3.4</td>
<td>3.3</td>
<td>3.3</td>
<td>3.4</td>
</tr>
</tbody>
</table>

Source: TSB, Marine Statistics, 2007; 2007 and 2008 are estimated by TC.

* The accident rate is the number of Canadian flag commercial vessels of 15 Gross Registered Tonnage (GRT) or more—excluding passenger and fishing vessels—in involved in shipping accidents per 1,000 vessel movements.

A review of TSB’s statistical analysis, using linear regression, shows a consistent downward trend in the number of commercial shipping accidents (both Canadian and foreign vessels) since 1997 (see Figure 2 below). According to TSB data, shipping accidents reached a 32-year low of 341 in 2008 (with 395 shipping accidents in 2007 and 361 in 2008), which means the trend depicted in Figure 2 continued through 2008.

Figure 2: Number of shipping accidents and accidents aboard ship, 1977–2006

Source: TSB Marine Statistics

\(^9\) According to TSB, shipping accidents typically account for 80 to 90 per cent of all marine accidents each year. Shipping accidents are defined as a type of reportable marine accident, which is defined as an accident resulting from the operation of a ship other than a pleasure craft. Shipping accidents do not include accidents aboard ship, such as when a person sustains serious injury or dies as a result of being on-board the ship or falling overboard, or coming into contact with any part of the ship or its contents.
The targeted 20 per cent reduction in the accident rate for foreign flag vessels has been reached.

Analysis of the data presented in Table 6 shows that the six-year average rate for 2003–2007 was 1.55, which represents a 20 per cent reduction in accidents for foreign flag vessels compared to the 1998–2002 five-year average rate of 2.0. Thus, the targeted percentage reduction has been achieved.

<table>
<thead>
<tr>
<th>Year</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident rate per 1,000 trips*</td>
<td>2.2</td>
<td>2.3</td>
<td>2.0</td>
<td>1.8</td>
<td>1.6</td>
<td>1.4</td>
<td>1.3</td>
<td>2.1</td>
<td>1.9</td>
<td>1.5</td>
<td>1.1</td>
</tr>
</tbody>
</table>

*Source: TSB, Marine Statistics, 2007

The safety record of fishing vessels has not improved over the last decade and was recently singled out by the TSB as an area of concern. Small fishing vessels are of particular concern, given their high accident rate.

TSB data clearly demonstrate that fishing vessels are involved in five times as many shipping accidents than other types of commercial shipping vessel, as shown in Figure 3.
In March 2010, the TSB’s on-line *Watchlist*, which identifies safety issues that pose the greatest risk to Canadians, stated “the number of accidents involving loss of life on fishing vessels remains too high.” According to the TSB, Canada’s fishing industry has averaged one fatality per month over the past five years. TSB statistics reveal that 60 fishers have lost their lives over the past five years (2005–2009) and that 15 vessels have been lost. TSB also reports that small fishing vessels have the country’s highest rate of serious marine accidents, with more than 200 reported yearly. Its concern with these figures prompted it to announce in 2009 that it will conduct an in-depth probe into the safety of small fishing vessels across Canada.¹⁰

Although recreational boating accounts for more deaths than commercial boating, TC has not yet set objectives or performance targets for this sector.

Recreational boating accidents account for an estimated 100 to 150 deaths per year (see Table 7 for actual figures collected in 2006). According to the national Lifesaving Society, one-third of drowning deaths in Canada are related to recreational boating. However, because statistics on

---

¹⁰ *The Telegram, (St. John’s, NL)* August 21, 2009.
death by drowning are collected primarily from coroners’ offices by non-governmental organizations (such as The Red Cross and Lifesaving Society) and are slow to be reported, it is difficult to get a complete or accurate sense of the links between deaths and recreational boating. Currently, comprehensive data dates back only as early as 2000. TC is currently working to develop an up-to-date reporting structure but, until it is in place, accurately assessing whether fatalities have been increasing or decreasing in the recent past is impossible. Due to the challenge of obtaining up-to-date data, TC has refrained from setting targets to reduce the frequency of such deaths.

Table 7: Recreational boating deaths, 2006

<table>
<thead>
<tr>
<th>Vessel type</th>
<th># of fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boat, not specified</td>
<td>2</td>
</tr>
<tr>
<td>Cabin motor boat</td>
<td>1</td>
</tr>
<tr>
<td>Canoe</td>
<td>19</td>
</tr>
<tr>
<td>Fishing vessel</td>
<td>4</td>
</tr>
<tr>
<td>Houseboat</td>
<td>2</td>
</tr>
<tr>
<td>Kayak</td>
<td>3</td>
</tr>
<tr>
<td>Open motor boat</td>
<td>11</td>
</tr>
<tr>
<td>Other motorized vessel</td>
<td>1</td>
</tr>
<tr>
<td>Other non-motorized boat</td>
<td>1</td>
</tr>
<tr>
<td>Paddle boat</td>
<td>1</td>
</tr>
<tr>
<td>Pontoon boat</td>
<td>2</td>
</tr>
<tr>
<td>Power boat, not specified</td>
<td>8</td>
</tr>
<tr>
<td>Rowboat</td>
<td>2</td>
</tr>
<tr>
<td>Unknown</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
</tr>
</tbody>
</table>

Source: Traffic Injury Research Foundation for MS (excludes NL)

When last measured in 2005, public confidence in the marine transportation system was high.

Between 2000 and 2005, six out of 10 Canadians rated marine travel as very safe, and four out of 10 viewed it as moderately safe (see Table 8 for the most recent data available).

Table 8: Public confidence in marine transportation

<table>
<thead>
<tr>
<th>Confidence level</th>
<th>March 2005 %</th>
<th>January 2005 %</th>
<th>August 2002 %</th>
<th>March 2002 %</th>
<th>May 2000 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not safe and secure</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Moderately safe and secure</td>
<td>40</td>
<td>46</td>
<td>44</td>
<td>41</td>
<td>36</td>
</tr>
<tr>
<td>Very safe and secure</td>
<td>57</td>
<td>51</td>
<td>54</td>
<td>57</td>
<td>63</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td># Don’t know (excluded)</td>
<td>24</td>
<td>12</td>
<td>9</td>
<td>17</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: TC Public Opinion Research Reports–April 2005
A number of events or initiatives may have served to change the level of confidence since 2005 but TC has not conducted new public opinion research to update data collected in 2005. Therefore, it is not possible to know whether the trend toward high confidence in marine safety remains at the levels depicted in this table.

**Summary:** The overall safety performance of the marine sector has improved over the last ten years. Absolute numbers for marine fatalities and commercial shipping accidents (Canadian and foreign vessels) have reached a historical low during the period. However, reduction targets for marine injuries and Canadian commercial accidents have not been met. Information presented by the TSB suggests that this is related to the lack of improvement in the safety performance of fishing vessels.

### 2.2 Oversight sub-activity (intermediate outcomes)

This section presents evaluation findings for the Oversight sub-activity.

In TC’s PAA, Marine Safety enforcement activities are grouped under the umbrella of the Marine Safety Oversight sub-activity. Activities such as vessels inspections and certification, seafarers’ certification, approval of training programs, or outreach are implemented to ensure compliance with safety regulations and the development of a strong safety culture within the marine community, and ultimately to a safe marine sector.

However, because the new regulatory framework and the new performance framework for this program have been recently implemented, there is no usable information to assess the safety culture in the marine sector. Therefore, this section will focus exclusively on compliance. To that end, we collected and analyzed performance information on various inspection regimes implemented by the program, as well as on certification of seafarers and supervision components of training activities.

The performance indicator for this expected result is “percentage of compliance” with the regulatory framework.

**Inspections**

TCMS is responsible for the inspection of Canadian and foreign vessels in Canadian waters and ports. The inspection program is divided into national and international segments and includes three regimes:

- At the domestic level, the regime is known as Flag State Control (FSC).
- At the international level, two regimes apply, namely Port State Control (PSC) and Port Warden.

TCMC records all FSC inspections in a national database called SIRS (Ship Inspection Reporting System). This is a statutory requirement. In addition, TCMS provides additional inspection oversight for vessels under 15 tons through its Small Vessel Monitoring and Inspection Program.
(SVMIP). Information on these inspections is recorded in the Small Vessel Information System (SVIS).

While Port Warden inspections are a significant activity for TCMS, primarily in the Pacific and Quebec regions, our evaluation did not undertake a thorough analysis of this, as Port Warden activities were initially not a focus of the evaluation. However, 2009 inspection data were analyzed. Future evaluations will include more in-depth assessment.

In the absence of an approved or working definition of “compliance” or of what would constitute an acceptable level of compliance, we used the following two measures of compliance in this evaluation:

- **The percentage of vessels inspected where no deficiencies have been detected.** This definition does not allow for the distinction between different levels or types of deficiencies. As such, it is likely to be too inclusive and could potentially inflate the proportion of non-compliant vessels.

- **The percentage of vessels that have been detained.** TC inspectors and others it delegates to act on its behalf have the authority to order that vessels under their jurisdiction be detained. Detentions help to prevent unsafe vessels from operating. They are also used to prevent the departure of vessels from a particular location while an investigation into alleged violations is being conducted. Research demonstrates that detained vessels show the highest probability of casualty. Given that detentions represent egregious cases of non-compliance, they can be considered an indicator of compliance.

**Between 2001 and 2007, compliance under Port State Control (PSC) has increased, meaning that the number of vessels with no deficiencies is higher than in the past and the number of vessels detained is lower. These results are congruent with the trend observed for the reduction of foreign ships accidents in Canadian waters.**

PSC inspects and verifies the compliance of foreign commercial vessels entering Canadian ports using international conventions and the Coastal Trade Act. TC inspectors gain their authority to act based on the Canada Shipping Act, 2001, the Coasting Trade Act, and the Paris and Tokyo MOUs (both signed in 1994). The goal of inspections and the legal instruments that support them is to help eliminate the threat that foreign commercial vessels pose internationally to life, property and the marine environment. In the agreements it has signed, Canada has agreed to target 25 per cent of all international cargo vessels within its waters.

Canada’s PSC system tracks and reports deficiencies on the basis of 22 categories; this enhances the system’s ability to efficiently focus inspection time on higher risk areas of the vessel. By keeping consistent statistics and producing an annual report that tracks types of deficiencies by general categories, TC inspectors are able to use a risk-based approach that ultimately targets inspection efforts on those vessels that are more likely to be substandard. The targeting “is based on a list of ranked risk factors (such as the age, flag and type of ship) which are used to classify

---

11 Inspectors’ Online Handbook [http://tcinfo/marinesafety/ntp/mioh/menu.htm](http://tcinfo/marinesafety/ntp/mioh/menu.htm) (on the TC Intranet)

12 MS website.
vessels as high, medium, or low risk.”13 These classification types are consistent with research showing that for Port State inspections, the age, vessel type and flag of registry are significant predictors of deficiencies.14

In recent years, the percentage of ships for which deficiencies were detected fell from 53 per cent in 2001 to 38 per cent in 2007 (see Table 9). During the same period, the percentage of vessels detained as a result of PSC inspection decreased from eight per cent to four per cent. These results are in line with the trend observed for the reduction of foreign ships accidents in Canadian waters.

Table 9: Summary of annual Port State Control (PSC) ship inspections

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspections</td>
<td>1,197</td>
<td>1,159</td>
<td>1,277</td>
<td>1,174</td>
<td>1,277</td>
<td>1,237</td>
<td>1,134</td>
</tr>
<tr>
<td>Deficiencies</td>
<td>634 (53%)</td>
<td>525 (45%)</td>
<td>495 (39%)</td>
<td>498 (42%)</td>
<td>482 (38%)</td>
<td>513 (41%)</td>
<td>434 (38%)</td>
</tr>
<tr>
<td>Detained</td>
<td>92 (8%)</td>
<td>49 (4%)</td>
<td>59 (5%)</td>
<td>68 (6%)</td>
<td>49 (4%)</td>
<td>27 (2%)</td>
<td>43 (4%)</td>
</tr>
</tbody>
</table>

Source: TSB, Marine Statistics.

The available data did not allow the evaluation to establish the level of compliance under Flag State Control (FSC).

FSC refers to the inspections of Canadian commercial vessels operating in Canadian waters and ports. The Canada Shipping Act 2000, the Arctic Waters Pollution Shipping Act and the Canada Labour Code give TCMS the mandate to ensure that all Canadian flag vessels comply with Canadian regulations. TCMS is also responsible for ensuring that foreign going Canadian-flag vessels are inspected in accordance with the appropriate international memoranda, conventions and protocols that Canada has ratified, adopted or acceded to. Some of this inspection activity is delegated to recognized organizations (ROs) in accordance with signed agreements between TC and these organizations.

Deficiencies observed during an inspection of a Canadian vessel are recorded on a Steamships Inspection Note (SI-07).15 The issuance of an SI-07 could, therefore, be seen as an indication that at least one deficiency was observed during an inspection. Using this logic, the observed rate of compliance could be calculated as the percentage of vessels inspected for which at least one SI-07 has been issued.

Although FSC inspections can cause a vessel to be detained, all records of detention are removed from the TCMS database once the vessel is released, so no historical record of vessel detention

---

15 Tier II–Program Procedures—TP 13585
exists. Therefore, this indicator could not be used to assess compliance and safety in relation to FSC inspections.

### Table 10: Summary of annual Flag State Control (FSC) ship inspections

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td># Inspections</td>
<td>4,712</td>
<td>4,875</td>
<td>4,725</td>
<td>4,965</td>
<td>4,950</td>
<td>4,886</td>
</tr>
<tr>
<td># Inspections with SI-07s</td>
<td>787</td>
<td>1,684</td>
<td>1,874</td>
<td>1,952</td>
<td>2,093</td>
<td>2,075</td>
</tr>
<tr>
<td>% of inspections with SI-07s</td>
<td>17%</td>
<td>35%</td>
<td>40%</td>
<td>39%</td>
<td>42%</td>
<td>42%</td>
</tr>
<tr>
<td>Total SI-07s</td>
<td>2,428</td>
<td>4,497</td>
<td>6,239</td>
<td>7,231</td>
<td>9,000</td>
<td>9,560</td>
</tr>
</tbody>
</table>

*Source: TCMS*

Table 10 shows that the rate of inspections resulting in SI-07s increased from 17 per cent in 2004 to 42 per cent in 2009. During this same period, the total number of SI-07s issued more than quadrupled. However, it is not possible to infer what the level of industry compliance might be based on these figures, for two reasons. First, the definition of deficiencies and how they are recorded in the database has changed during this time period. TCMS staff indicated that this change to data reporting could explain much of the increase in the total number of SI-07s issued. Secondly, SI-07s are sometimes used for purposes other than recording deficiencies observed during inspection. Our analysis of a sample of 116 SI-07s revealed that at least 9 per cent of the sample were notes produced by inspectors. They did not signal deficiencies.

Given the lack of reliable data, the effectiveness of Flag State Control (FSC) inspections was tentatively assessed by examining the link between the amount of inspection activity and the safety performance of domestic commercial vessels. Data outlined in Table 11 show that there is a weak but negative relationship (-0.075) between accidents and FSC inspections, suggesting that more inspections are associated with fewer accidents. However, this association does not establish causality. In other words, while there is some indication of the effect of inspections on accident rates and of their impact on overall levels of safety, available data did not allow us to verify whether a causal link exists between the inspections and the safety level achieved, or to isolate the impact of inspections from other factors that could have had an impact.

The data also demonstrate that vessels that had accidents had received an average of 3.1 SI-07s and vessels that had not had accidents had received an average of 4.1 SI-07s. The correlation calculated was negligible, 0.00785, indicating no relationship. See Table 11.
Table 11: Correlation of inspections and accidents for vessels in SIRS database, October 2007–December 2008

<table>
<thead>
<tr>
<th>SI-07s</th>
<th>Accidents</th>
<th>Inspections</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00000</td>
<td>0.00785</td>
<td>1.00000</td>
</tr>
<tr>
<td>0.51219</td>
<td>-0.07508</td>
<td>1.00000</td>
</tr>
</tbody>
</table>

*Source: SIRS, TSB (Based on 2,936 vessels in database)*

A review of the Port Warden inspection activity show that the level of compliance with regulations in 2009 was high. This result is congruent with the observed reduction of marine fatalities and commercial shipping incidents.

Improperly loaded cargo can shift and cause a vessel to capsize, resulting in loss of life and loss of vessel. Port Warden inspectors ensure that “high-risk cargo is loaded in accordance with approved practices, relevant regulations and codes to ensure proper vessel stability, structural integrity and securing of deck cargo (i.e. timber).”16 Port Warden inspections are done mostly to meet the requirements of Canada’s Cargo, Fumigation and Tackle regulations and to ensure that all vessels loading grain, mineral concentrate, ores and timber on deck are inspected before and after loading, as well as during loading, when the loading plan requires it.

This evaluation calculated compliance with respect to Port Warden inspections based on “preliminary” certificates issued. Typically, a port warden’s first job will be to inspect a vessel’s relevant certification, verify the various loading calculations, and examine the vessel itself to ensure that no structural or other deficiencies exist that would make it unsafe. If the calculations are correct and no deficiencies are found, the vessel is issued a Readiness to Load certificate. However, there are times when a deficiency is deemed serious enough to withhold the Readiness to Load certificate and delay the vessel. In such cases, the inspector issues a “preliminary” certificate. The vessel would then need to repair the flagged deficiency before the inspector will issue a Readiness to Load certificate.

After a vessel is issued the Readiness to Load certificate, the Port Warden would return to conduct a second examination. If no issues are flagged, the inspector will issue Fitness to Proceed certificate. It confirms that the vessel is capable of carrying the cargo and has been loaded according to regulations.

The rate of compliance for Port Warden activities is calculated by comparing the number of preliminary certificates with the total number of ships inspected. Table 12 summarizes this comparison and shows that the level of compliance is high. This result is congruent with the observed reduction of marine fatalities and commercial shipping incidents.

---

16 Audit of Inspection Standardization Practices, September 2006, file number: 1577-04-012
Table 12: Compliance rate of ships inspected by Port Warden

<table>
<thead>
<tr>
<th></th>
<th>Preliminary</th>
<th>Certificate</th>
<th>Fitness</th>
<th>Total # Ships</th>
<th>% Compliance*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain ships certificates</td>
<td>155</td>
<td>928 Readiness Certificates</td>
<td>841 Fitness Certificates</td>
<td>927</td>
<td>83%</td>
</tr>
<tr>
<td>Timber ships certificates</td>
<td>0</td>
<td>78 Timber Deck Cargo Certificates</td>
<td>96 Fitness Certificates</td>
<td>88</td>
<td>100%</td>
</tr>
<tr>
<td>Concentrates ships certificates</td>
<td>0</td>
<td>132 Stowage &amp; Securing Certificates</td>
<td>215 Fitness Certificates</td>
<td>217</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Compliance as the percentage of vessels not issued a Preliminary Certificate.
Source: TCMS

It should be noted that the analysis above—conducted using data only recently provided to the evaluation team—remains elementary. Port Warden inspections were initially not included in the scope of this evaluation and were therefore not a focus of interviews and surveys. As such, when recent data became available, it was not possible to deepen our analysis and clearly demonstrate a causal link with overall safety performance.

It is difficult to reach a conclusion regarding the level of compliance of small commercial vessels.

To calculate the level of compliance for small commercial vessels, the evaluation looked at number of registered small vessels that received SI-7s. All small vessels in Canada were to be registered in TC’s small vessel register by July 2009. Between 2001 and 2009, 13,542 vessels were listed in the small vessel registry. Of these, 1,332 (or 9.8 per cent) were inspected during the same period. Estimated compliance rate based on these inspections is 54 per cent (see Table 13).

Table 13: Percentage compliance of small commercial vessels, 2001-2009

<table>
<thead>
<tr>
<th></th>
<th>Less than 10 SI-07s</th>
<th>10 or more SI-07s</th>
<th>Zero SI-07s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of vessels inspected</td>
<td>499 (4.0 SI-07s per vessel on average)</td>
<td>109 (15.0 SI-07s per vessel on average)</td>
<td>724</td>
</tr>
<tr>
<td>Percentage of compliance/non-compliance</td>
<td>37% (non-compliance)</td>
<td>8% (non-compliance)</td>
<td>54% compliance</td>
</tr>
</tbody>
</table>

However, the figures above should be approached with a great deal of caution.

---

17 With the coming into force of CSA 2001 in July 2007, TC is now mandated to ensure that all commercial vessels are registered, including vessels 15 tons and under (Section 46).
18 There are an estimated additional 50,000 other small vessels (such as canoes) that were not covered under the previous Act.
First, SI-7s do not provide a robust basis to measure compliance. As discussed earlier, the definition of deficiencies and how they are recorded has changed over time. Moreover, SI-7s do not always signal deficiencies.

Second, the sampling of small commercial vessels does not allow solid statistical analysis and conclusions. TCMS provides oversight for vessels 15 tons or less under its Small Vessel Monitoring and Inspection Program (SVMIP)\(^1\), and inspections under SVMIP are either planned or random. Planned inspections are conducted at the request of the owner/operator. Information on how and why vessels are targeted for random inspections by TC inspectors is not available.

Finally, it is difficult to establish compliance when many current regulations still do not apply to smaller commercial vessels. Before the *Canada Shipping Act 2001* (CSA 2001) came into effect, the law did not require commercial vessels under 15 tons to be inspected, with some exceptions (see Table 14 below). While it is true that when CSA 2001 came into effect in July 2007, the overall exemption for small vessels under 15 tons no longer applied, and that TC is now mandated, under Section 46 of CSA 2001, to ensure that all commercial vessels are registered, including vessels 15 tons and under, this does not imply a Ministerial obligation to have a full inspection regime (through the use of regulation and mandatory inspection periods) for all smaller vessels, only that registered vessels are subject to the provisions of the CSA 2001 and any regulations that may apply. However, the evaluators have been told that many of the regulations that are a carry over from the previous *Canada Shipping Act* (Small Fishing vessel Inspection Regulations, Hull Inspection Regulations, etc….) and some new regulations (Vessel Certificate Regulations) do not apply to lower tonnage vessels.

### Table 14: Inspection requirements for selected vessel classes under former CSA

<table>
<thead>
<tr>
<th>Category</th>
<th>First inspection</th>
<th>Periodic inspection</th>
<th>Intermediate inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Small commercial vessels: 15 T or less</strong></td>
<td>Not mandatory(^{20})</td>
<td>Not Mandatory</td>
<td>Not mandatory</td>
</tr>
<tr>
<td><strong>Small fishing vessels: greater than 15 T but less than 150 T</strong></td>
<td>Mandatory</td>
<td>Mandatory</td>
<td>As needed</td>
</tr>
<tr>
<td><strong>Large fishing vessels: greater than 150 T</strong></td>
<td>Mandatory</td>
<td>Mandatory</td>
<td>As needed</td>
</tr>
<tr>
<td><strong>Passenger vessels (more than 12 passengers): less than 15 T:</strong></td>
<td>Mandatory</td>
<td>Mandatory</td>
<td>As needed</td>
</tr>
</tbody>
</table>

\(^{1}\) While not mandated to do so under the former Act, TCMS provided and continues to provide some oversight for vessels 15 tons or less. The Small Vessel Monitoring and Inspection Program (SVMIP) applies to small commercial vessels, 0–15 tons, including passenger vessels carrying no more than 12 passengers and other non-pleasure, or work vessels.

\(^{20}\) Tonnage measurement, materials inspection, equipment inspection, lifesaving equipment approval, and escape systems evaluations are mandatory for commercial vessels 15 tons or less on a one-time basis. First inspection is mandatory if the vessel is steam powered and weighs more than five tons.
TC does not monitor Flag State Control (FSC) inspections in a way that is conducive to a risk-based approach.

When the evaluation team was doing its research, deficiency information (in the form of SI-07s) was available in a database called the Ship Inspection Reporting System (SIRS). Historically, only the total number of SI-07s has been recorded, meaning that unlike PSC deficiency data, the deficiency data captured for the FSC could not be easily extracted to provide useful information such as “deficiencies by category.” This is despite the fact that SI-07 forms capture details of each deficiency (such as condition and location of the vessel, the regulation that is being breached, the action required, and the time set by the inspector to rectify the problem).

As of October 2007, TCMS has been capturing even more data from the SI-07 form, namely a description of the deficiency and its assignment to one of a possible 320 categories. However, unlike the PSC coding of deficiencies, which uses 22 codes, the FSC coding results in such a large number of different types of deficiencies that a labour-intensive exercise would be required to group codes into smaller categories describing general types of deficiencies. With the goal of doing this so that general patterns in the data could be observed, our evaluation team aligned SI-07s issued from October 2007 to December 2008 into a smaller number of categories to determine what performance information could be mined.

Table 15 shows the number and percentage of SI-07s by type of defect, based on a sample of 116 SI-07s recorded by TCMS during this 15-month period. The sample was drawn from 11,645 SI-07s (every 100th SI-07). Most SI-07s in our sample were issued for deficiencies in fire and emergency equipment (29 per cent). The next largest category was machinery (at 16 per cent). About nine per cent of the sample SI-07s were not deficiencies (noted as Non-defect/notes in the table).

<table>
<thead>
<tr>
<th>Category</th>
<th>First inspection</th>
<th>Periodic inspection</th>
<th>Intermediate inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger vessels (12 or less passengers):</td>
<td>Not mandatory</td>
<td>Not mandatory</td>
<td>Non mandatory</td>
</tr>
<tr>
<td>less than 15 T.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: TCMS
Table 15: Sample\textsuperscript{21} of SI-07s by type of defect from October 2007 to December 2008

<table>
<thead>
<tr>
<th>Type of defect</th>
<th># of SI-07s</th>
<th>% Deficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications equipment</td>
<td>3</td>
<td>2.6</td>
</tr>
<tr>
<td>Electrical</td>
<td>5</td>
<td>4.3</td>
</tr>
<tr>
<td>Fire and emergency equipment</td>
<td>34</td>
<td>29.3</td>
</tr>
<tr>
<td>Hull and superstructure</td>
<td>16</td>
<td>13.8</td>
</tr>
<tr>
<td>SI-07 notice that SI-07s are incomplete</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Machinery</td>
<td>19</td>
<td>16.4</td>
</tr>
<tr>
<td>Navigational lights, charts, etc.</td>
<td>12</td>
<td>10.3</td>
</tr>
<tr>
<td>Official documents</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Personnel</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Pollution preventing equipment</td>
<td>4</td>
<td>3.4</td>
</tr>
<tr>
<td>Steering system</td>
<td>3</td>
<td>2.6</td>
</tr>
<tr>
<td>Stability related</td>
<td>4</td>
<td>3.4</td>
</tr>
<tr>
<td>Non-defect/notes</td>
<td>10</td>
<td>8.6</td>
</tr>
<tr>
<td>Unknown SI-07s</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>100</td>
</tr>
</tbody>
</table>

\textit{Source: SIRS}

Even if TCMS improves the way it identifies, captures and extracts data, deficiency or compliance information alone cannot target risk. In fact, deficiencies are only part of the analysis needed to identify and target high-risk vessels. Other types of information are necessary to implement a risk-based FSC inspection regime.

In a United States Coast Guard (USCG) study,\textsuperscript{22} researchers were able to determine which inspection activities were most important in addressing risk. They based their analysis on where the most accidents occurred and their economic impact. As well, the study analyzed accidents according to basic categories of risk, which included vessel type and inspection district to which an accident or casualty belonged. They then analyzed each accident in terms of the deficiency or inspection category to which it could be linked.\textsuperscript{23}

TCMS could consider improving its risk analysis by performing similar analyses and by obtaining more information on the economic costs of accidents.

**Inconsistency in the conduct of Flag State Control (FSC) inspections is an area of concern.**

According to a review of Program files, key informant interviews and surveys of TCMS staff and stakeholders, there are national inconsistencies in how TCMS inspectors interpret regulations and conduct inspections.

\textsuperscript{21} Sampling of 11,645 SI-07s, choosing every 100\textsuperscript{th} SI-07.


\textsuperscript{23} There were nine basic deficiency categories, including human factors, hull, documentation, cargo handling, lifesaving systems, and steering/navigation, among others.
From Program documents, we learned that “inconsistency is definitely an issue within Marine Safety, namely inspections and interpretation of regulations [that] vary between inspectors.”

Survey results revealed that for both stakeholders and staff, inconsistency in the way regulations are applied was a major concern.

Staff we interviewed told us that consistency in the conduct of inspections was also an area of concern for them, mostly because inconsistent inspection practices and interpretation of regulations can lead to an uneven playing field for the industry.

During visits to the regions, we learned that it is common knowledge that certain operators “shop” for inspectors in the regions or certain TCCs because they know a certain regulation will be differently interpreted or enforced less strictly. There is also concern that this type of conduct may lead to an increased risk of unsafe marine practices. According to Program documents “one of the concerns …as to the lack of consistency is [that] industry may recognize this and start to ask for a particular TCMS examiner to avoid failure/detention.”

Two factors contribute to these inconsistencies. One is lack of quality control processes. The 2006 Audit of Inspection Standardization Practices noted that there was no formal process for assessing how inspectors conduct domestic vessel inspections. Our evaluators confirmed that this is still the case. Instructions were sent from HQ requesting that managers of inspection services vet or review 10% of all inspection activities. This expectation and target was part of the management response to the 2006 TC audit: “Managers are required to evaluate inspection information conducted by their inspectors, documented accordingly, and appropriate follow up action taken where necessary. Target is for 10% of files to be reviewed…” The interview evidence collected during our evaluation shows that this is generally not being done or, in some instances, only done when a stakeholder lodges a complaint. The fact that such processes are not documented makes it difficult to verify what may be happening. TCMS is currently reviewing its quality control process.

Secondly, management oversight of inspection practices is weak at the national level. The 2006 audit also identified the “limited nature of the functional direction governing the conduct of inspections” as the primary cause of inconsistent practices within the regions. Interviewees in general identified the governance structure as a factor leading to the development of inappropriate work instructions and policies within regions or TCCs. This then contributed to inconsistent practices.

---

While there is a mandatory training program on Canadian regulations for all new inspectors, The National Training Program (NTP) does not currently offer specialized courses or include mandatory refresher training to ensure all inspectors remain up-to-date.

The 2006 audit contends that a recognized way to minimize interpretation differences among inspectors and regions is to provide ongoing training. This might be especially important in a situation where new regulations are coming into force.

A review of Program documents suggests that as inspectors begin operating under the new regulations, the risk of inconsistencies increases: “uncertainties, changes, new ways of doing business and more judgment calls on the part of inspectors raises concerns.” As one interviewee said, “because CSA 2001 is less prescriptive, having people trained in interpretation is key.” Interviews with staff confirmed that currently only new inspectors are required to receive training. However, our interviews show that overall, only 48 out of 90 (or 53 per cent) of TCMS staff felt adequately trained to do all aspects of their job.

The mandate of NTP is to provide job-specific training to TCMS staff in support of national objectives and to promote national consistency. Its worth has been upheld and its role reasserted as an ongoing objective in both the 2003–2010 and 2008–2015 Marine Safety Strategic Plans. The current NTP consists of 11 required courses whose completion results in the appointment or designation of Marine Safety Inspectors. In 2008, NTP delivered 16 mandatory courses, nine refresher courses and it trained 417 inspectors. Each course ranges from 1 to 10 days. The NTP has been in place since 1997 but still needs refinement.

Within the inspector population, evidence suggests that refresher training for “ongoing” inspectors is required to ensure everyone is on the same page. In 2007, the International Marine Organization (IMO) conducted an audit of maritime administration and found that in Canada “there was no systematic approach for updating the knowledge of marine inspectors. Training is made available but is not mandated or part of a systematic training plan.” One of the consequences of such ad hoc approach is the risk of inconsistent inspection practices. As the 2006 audit noted, under the current training approach “there is a risk of differing inspection practices between new and senior inspectors” because “only new inspectors are required to take courses for ship inspection and certification.” Some refresher courses are available but management does not identify them as requirements. Regional visits confirmed that there is “no requirement for refresher training for inspectors” and this was a concern in the regions.

A Training Needs Analysis conducted for TCMS in 2008 by the AVCON Group was designed to evaluate existing training programs provided by TCMS and to provide recommendations to upgrade and modernize the program. Both the review and interviews with TCMS staff confirmed that periodic refresher training is required to ensure that inspectors’ knowledge and skills remain

---

27 Audit of Inspection Standardization Practices, September 2006, file number: 1577-04-012
28 TCMS document.
29 The stated purpose of the program is to ensure that inspectors are aware of the specifics of Canadian legislation and international agreements which fall under the Minister’s jurisdiction.
30 IMO Audit Canada, October 2007.
31 Audit of Inspection Standardization Practices, September 2006, file number: 1577-04-012
current. This is necessary for new legislation but also for areas that may not have been used for a long time (OHS, TDG, etc.). Rather than more formal training, inspectors have also suggested that they would like more opportunity to meet with their counterparts in other regions. This type of cross-pollination would allow them to learn from inspectors who use certain skills more often than they do.

Interviewees suggested that more effort is also needed to ensure inspectors are being trained to work in a Canadian context. Both inspectors and senior staff noted that in addition to technical training, more effort should be placed on sensitizing inspectors who are working in different cultural contexts, such as fishing communities or First Nations’ communities. Given a shrinking pool of available inspectors worldwide and the need for TCMS to recruit from an international workforce, various senior staff recognized that training to work in a Canadian setting needs to be addressed through more specific training.

Interviewees also suggested that both the type of vessels and the training received by those recruited from an international context are not aligned with the types of vessels predominately found in Canada. The AVCON report, as well as interviews with senior management, suggests that key elements of the basic inspector training courses need to be expanded to include information on specialty subjects. Complementary training that focuses on the specifics of an inspector’s job (for example, offshore installations in the Atlantic region) is required so that an inspector with more generic knowledge can obtain the specialized knowledge he/she requires. Some regions currently sponsor specialty courses but they are not part of the NTP. Because they are not centrally managed, they are also not consistently funded or offered.

**Summary:** Performance information on compliance does not allow us to determine whether there is a causal link between the program activities and the safety performance of the sector. Nevertheless, the data collected on the Port State Control inspection regime show congruent trends between the increase of compliance and the reduction on marine accidents.

With respect to the domestic inspection regime, the Flag State Control, compliance information collected shows a dramatic increase of non-compliance between 2004 and 2008 (a four-fold increase in the number of SI-7s) while for the same period, we see a 10% decrease in the average number of Canadian flag commercial accident rate. However, we believe that changes in inspection work processes and changes to the way TCMS records SI-7s, as well as inconsistencies variations in the conduct of Flag State inspections, may have masked real rates of compliance. We therefore call for extreme caution when using Flag State compliance data to assess the performance of the program.

Finally, based on the available information, it is also difficult to reach conclusions regarding the compliance of small vessels.

**Training and Certification**

Issuing certificates to Canadian seafarers and approving seafarers’ training programs are two activities conducted under the umbrella of the Oversight sub-activity, with the goal of increasing compliance and promoting a safety culture. TCMS’s expectation when it comes to the
certification and training of seafarers is a reduction in the number of casualties and/or incidents for which unqualified seafarers are a contributing factor.

Each year TSB investigates several incidents involving crew members lacking the skills and knowledge required for safe operations. For example, TSB cited inadequate crew training and unsafe operating practices in incidents that resulted in deaths on the *Cap Rouge II*, *Melina* and *Keith II*, *Ryan’s Commander*, *Hope Bay*, *Big Sister*, and *Lannie & Sisters II*. Although certified, these crew members had not remained current with marine safety developments, were unable to cope with non-routine situations, used unsafe practices, or did not follow accepted maritime procedures. In one case, the TSB concluded that in the absence of regulatory and industry-wide standards for ensuring that officers have received up-to-date training on the equipment they use, some mariners may lack the skills required to operate modern bridge equipment, thus jeopardizing the safety of the vessel, passengers or the environment. However, not enough documentation on the number of occurrences exists to conclude on any trends in this area.

**Between 2005 and 2008, a total 12,656 seafarer certificates were awarded and only 11 have been revoked.**

Since data that would establish a link between the certification of seafarers and the contribution that their lack of qualifications or training might make to the number of accidents and deaths were not available, we instead examined the number of seafarers who were involved in an accident and who also had their certifications revoked.

According to its Automated Certification and Examination Databases (ACES), TCMS issued 12,656 certificates to seafarers from 2005 to 2008 (see Table 16). It is possible that one seafarer was issued more than one certificate over this four-year period, which would explain the greater number of certificates issued in the four-year period relative to the total number of candidates shown in Table18. It is clear that in the Atlantic region (Maritime and Newfoundland) more seafarers are being issued certificates than in any other region.

<table>
<thead>
<tr>
<th>Region</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>Total Candidates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maritime</td>
<td>584</td>
<td>880</td>
<td>594</td>
<td>923</td>
<td>2,693</td>
</tr>
<tr>
<td>Newfoundland</td>
<td>870</td>
<td>1224</td>
<td>835</td>
<td>739</td>
<td>3,121</td>
</tr>
<tr>
<td>North</td>
<td>39</td>
<td>54</td>
<td>56</td>
<td>28</td>
<td>166</td>
</tr>
<tr>
<td>Ontario</td>
<td>438</td>
<td>544</td>
<td>468</td>
<td>460</td>
<td>1,656</td>
</tr>
<tr>
<td>Quebec</td>
<td>465</td>
<td>675</td>
<td>581</td>
<td>575</td>
<td>1,886</td>
</tr>
</tbody>
</table>

32 TSB Marine Fact Sheet (TSB Marine Investigation Reports, M02W0147, M05N0072, M04N0086, M04W0034, M07M0088, and M06N0074, respectively). http://www.tsb.gc.ca/eng/surveillance-watchlist/marine/marine_1pdf
34 Unfortunately the database does not break down the numbers by TC regions but rather by the ports found in the provinces normally associated with the region. For example, both Maritime and Newfoundland are captured separately but are considered the Atlantic region by TCMS. To ensure ongoing consistency and the ability to compare between databases, this should be changed.
<table>
<thead>
<tr>
<th>Region</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>Total Candidates</th>
</tr>
</thead>
<tbody>
<tr>
<td>West</td>
<td>735</td>
<td>1092</td>
<td>853</td>
<td>824</td>
<td>3134</td>
</tr>
<tr>
<td>Total</td>
<td>5,136</td>
<td>6,475</td>
<td>5,394</td>
<td>5,557</td>
<td>12,656</td>
</tr>
</tbody>
</table>

Source: TCMS, ACES.

As determined in the IMO member State Audit Scheme (June 2007), where seafarers, through an investigative process, have their certificates suspended due to professional incompetence, they are required to turn in the certificate and/or other documentation and these suspensions are noted in the ACES system. However, only a limited number of certificates were revoked for such reasons between 2005 and 2008. The actual number was 11—close to zero per cent of the total. This would suggest that a lack of seafarer training is not an issue.

**While TCMS has updated examinations for seafarers to reflect the new regulations, there is room to improve seafarer knowledge.**

Marine Safety is responsible for regulating seafarer training, implementing international covenants and communicating them to Canadian seafarers. Under *CSA 2001*, every vessel must have an authorized representative responsible for ensuring that their crew is trained. While vessel owners should be employing properly trained personnel on their ships, each seafarer should be aware of and comply with the regulatory requirements for their own job. For example, a fishing master would take different training from someone working on an oilrig.

TCMS develops the syllabi for seafarer training, which is delivered by marine institutes it has approved. There are 68 course providers and 32 courses listed in the 2009 TCMS publication. As confirmed by TCMS staff, twice a year approved marine schools are added to their website. Each August, as part of its monitoring of programs, TCMS reviews whether the providers are complying with requirements. As of the spring of 2009, approximately 75 per cent of the changes required to ensure courses conform to *CSA 2001* had been made.

A number of survey respondents stated that seafarer examinations, used for testing seafarer knowledge, are outdated. Some voiced concern that the exams were not properly assessing knowledge because the questions had been passed from person-to-person. This finding is in line with that of the Marine Safety Service Line Review of 2004, which notes that a shortfall exists in the ability of the Program to update the examinations, thereby increasing the risk that cheating will occur. Course providers said that seafarers know they only need to meet a minimum pass rate and so they leave the course part way through to “take their chances.” Other TCMS staff told us that about 50 per cent of the questions, for all courses, have been updated in the past six years.

---

35 *CSA 2000, CSA 2001* and the *International Convention on the Certification of Seafarers* include requirements that properly trained and competent seafarers operate Canadian ships. As signatories to STCW 95—the International Marine Organization Convention on Standards of Training, Certification and Watch Keeping—TC is obligated to meet or exceed the standards. In 2004, MS issued a Training and Certification Quality Manual, which details how the requirements of STCW 95 will be met. The Marine Personnel Regulations (2007), under *CSA 2001*, set out the crewing and certification required on vessels. To communicate the changes to seafarers, *The Examination and Certification of Seafarers TP 2293E* was updated and posted to the MS website following implementation of the new regulations in 2007.

36 Pg. 58, *Marine Safety Service Line Review*. 

---
Since 2004, TCMS considerable work has been conducted to refresh the examination databank. For example, the Nautical examinations have already undergone significant changes following the coming into force of the new Marine Personnel Regulations (MPR). The ability and efficiency of course providers who administer written exams is still evolving.

Respondents were asked in our survey “How would you describe the level of awareness among seafarers about all (new and old) regulations that impact on their work?” As Figure 4 demonstrates, on a five-point response scale ranging from 1 (very low) to 5 (very high), a majority of respondents selected 1 or 2 (at the low end of the scale); 48.8 per cent of stakeholders and 50.5 per cent of staff responded with 1 or 2; the average of all responses for both groups was 46 per cent; and the mean rating for this question for both groups was 2.3 out of 5.

**Figure 4: Perceived level of seafarers’ awareness of regulations as it affects their work**

![Figure 4: Perceived level of seafarers’ awareness of regulations as it affects their work](image)

**Note:** The percentages in the chart will not sum to 100% because of missing responses.

**Source:** Survey of staff and stakeholders

**TC has taken concrete steps to improve the way tests are administered to recreational boaters**

**CSA 2001** also covers recreational boaters. As of September 2009, by regulation, proof of competency is required for the operation of motorized boats in Canada by persons of all ages, except for those using boats in the waters of the Northwest Territories and Nunavut. Proof of competency can be shown by

- proof of having successfully completed a boating safety course in Canada before April 1, 1999
- possession of a valid Pleasure Craft Operator Card (PCOC) issued after the successful completion of an accredited test, or
- completion of a rental boat safety checklist (for power-driven rental boats), valid for the rental period.
TCMS data indicate that approximately half of those recreational boaters estimated to require a PCOC had obtained it by the date for the regulation’s deadline (September 2009). Of the approximately eight to nine million recreational boaters in Canada, TCMS staff estimate that four to six million operate a motorized boat and were required to have the card by September 2009. TC tracks the performance of this regulation by collecting information on the number of people who have successfully obtained a card since the regulations came into force, though the course providers are not required to share this data with TC. Based on our interviews, stakeholders revealed that, “Currently, course providers maintain their own individual database of cardholder information and they are not legislated to share this information with TC. As a result, TCMS has no access to a centralized record or verification process in order to determine which operators have successfully obtained a Pleasure Craft Operator Card.” However, TCMS staff sends out a data request each December to all accredited course providers and claim that most respond.

Table 17 shows that since 1999, 1.6 million PCOC cards have been issued. An additional data request to course providers in August 2009, one month before the deadline for the final phase of the PCOC implementation, showed that approximately 2.7 million cards had been issued.

<table>
<thead>
<tr>
<th>Region</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.C.</td>
<td>16,224</td>
<td>16,234</td>
<td>10,965</td>
<td>26,445</td>
<td>32,652</td>
<td>16,726</td>
<td>9,271</td>
<td>13,567</td>
<td>12,317</td>
<td>13,800</td>
<td>168,201</td>
</tr>
<tr>
<td>Alb.</td>
<td>1,389</td>
<td>4,969</td>
<td>4,436</td>
<td>11,503</td>
<td>21,004</td>
<td>13,669</td>
<td>8,390</td>
<td>11,464</td>
<td>13,179</td>
<td>14,471</td>
<td>104,474</td>
</tr>
<tr>
<td>Sask.</td>
<td>164</td>
<td>8,653</td>
<td>6,477</td>
<td>10,711</td>
<td>11,314</td>
<td>4,944</td>
<td>5,300</td>
<td>5,310</td>
<td>6,164</td>
<td>7,160</td>
<td>66,197</td>
</tr>
<tr>
<td>Man.</td>
<td>951</td>
<td>4,595</td>
<td>5,699</td>
<td>10,001</td>
<td>11,908</td>
<td>2,322</td>
<td>4,488</td>
<td>4,747</td>
<td>4,607</td>
<td>4,905</td>
<td>54,223</td>
</tr>
<tr>
<td>Ont.</td>
<td>47,746</td>
<td>77,139</td>
<td>60,337</td>
<td>70,766</td>
<td>108,263</td>
<td>62,535</td>
<td>46,369</td>
<td>68,263</td>
<td>65,247</td>
<td>112,063</td>
<td>718,728</td>
</tr>
<tr>
<td>Que.</td>
<td>14,907</td>
<td>32,938</td>
<td>58,537</td>
<td>76,521</td>
<td>117,489</td>
<td>31,198</td>
<td>13,771</td>
<td>22,510</td>
<td>38,001</td>
<td>29,097</td>
<td>434,969</td>
</tr>
<tr>
<td>N.B.</td>
<td>165</td>
<td>5,213</td>
<td>1,030</td>
<td>3,271</td>
<td>3,310</td>
<td>1,371</td>
<td>631</td>
<td>1,184</td>
<td>1,327</td>
<td>1,213</td>
<td>20,208</td>
</tr>
<tr>
<td>N.S.</td>
<td>1,733</td>
<td>5,573</td>
<td>3,155</td>
<td>6,255</td>
<td>9,826</td>
<td>2,683</td>
<td>1,625</td>
<td>1,982</td>
<td>1,839</td>
<td>2,079</td>
<td>36,752</td>
</tr>
<tr>
<td>P.E.I.</td>
<td>150</td>
<td>371</td>
<td>265</td>
<td>542</td>
<td>783</td>
<td>213</td>
<td>69</td>
<td>104</td>
<td>165</td>
<td>307</td>
<td>2,969</td>
</tr>
<tr>
<td>Nfld.</td>
<td>170</td>
<td>520</td>
<td>839</td>
<td>1,554</td>
<td>1,470</td>
<td>1,134</td>
<td>609</td>
<td>707</td>
<td>1,918</td>
<td>2,027</td>
<td>10,948</td>
</tr>
<tr>
<td>Yukon</td>
<td>-</td>
<td>35</td>
<td>-</td>
<td>2</td>
<td>54</td>
<td>152</td>
<td>16</td>
<td>32</td>
<td>753</td>
<td>94</td>
<td>1,103</td>
</tr>
<tr>
<td>N.W.T.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>70</td>
<td>-</td>
<td>22</td>
<td>72</td>
<td>200</td>
</tr>
<tr>
<td>Nunavut</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td>13</td>
<td>14</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>85,092</td>
<td>156,240</td>
<td>151,740</td>
<td>217,571</td>
<td>318,076</td>
<td>136,948</td>
<td>90,609</td>
<td>129,880</td>
<td>145,552</td>
<td>187,302</td>
<td>1,621,165</td>
</tr>
<tr>
<td>USA</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PCOC</td>
<td>85,092</td>
<td>156,240</td>
<td>151,740</td>
<td>217,571</td>
<td>318,076</td>
<td>136,948</td>
<td>90,609</td>
<td>129,880</td>
<td>145,552</td>
<td>187,302</td>
<td>1,621,165</td>
</tr>
</tbody>
</table>

Source: TCMS

TCMS updated the regulations in 2007, following strong criticisms in the media and formal complaints about how the program was being administered. A new test protocol was implemented in 2008; this improved the test administration process. On the heels of this, TCMS consulted with course providers and the recreational boat industry and as of November 2009 proposed a strengthened accreditation framework for providers. These changes have introduced a national course provider monitoring system.

According to various presentations by MS officials, including at CMAC 2008, “Results of monitoring efforts of course providers from May 2008 to September 2008 have shown significant
improvement in the way tests are administered.” Based on the updated 2007 regulations, each provider must send copies of its course to TC for review and accreditation. Once reviewed, TCMS accredits those courses that meet the criteria defined in the regulations. Between January 2008 and March 2009, TC monitored 132 training sessions and suspended four course providers.

**Summary:** Evaluation findings show that TCMS has mostly updated examinations for seafarers to reflect the new regulations. Nevertheless, half of TC staff and stakeholders survey for this evaluation perceived the level of seafarers’ awareness or regulations to be very low or low, suggesting that there is room for improving seafarers’ knowledge.

### 2.3 Regulatory Framework sub-activity (immediate outcomes)

Since 2001, MS has been working to develop a new regulatory framework; however, the implementation of major regulatory changes only started in 2007. For this reason, the evaluation focused on output indicators, basically to verify that the regulatory framework developed and currently being implemented by the Program has resulted in regulations that are streamlined, harmonized, and consistent with federal regulatory policies. We also focused on the consultation processes related to the new regulatory framework.

Expected results for the new regulatory framework that forms part of MS are:

- It must comply with federal regulatory policy and directives.
- It must be aligned with *CSA 2001* and international conventions.

Regulatory reform is being implemented in two phases.

Phase 1 involved reforming those regulations that were inconsistent with *CSA 2001*, deemed to have a substantial impact on safety and the environment, and that were needed to bring the CSA into force on July 1, 2007. Below is a list of Phase 1 regulations.

- Aids to Navigation Protection Regulations (Repealed)
- Ballast Water Control and Management Regulations
- Cargo, Fumigation and Tackle Regulations
- Load Line Regulations
- Marine Personnel Regulations
- Regulation for the Prevention of Pollution from Ships and for Dangerous Chemicals
- Publication of Standards Regulations (Repealed)
- Safety Management Regulations
- Shipping Inquiries and Investigations Rules (Repealed)
- Ships Registry and Licensing Fees Tariff
- Vessel Certificate Regulations
- Vessel Clearance Regulations
- Vessel Detention Orders Review Regulations
• Vessel Registration and Tonnage Regulations

Phase 2 addresses regulations that are currently consistent with the CSA 2001 and were not critical to the Act’s implementation on July 1, 2007.

The TCMS regulatory reform project is consistent with the Government of Canada Regulatory Policy and with the Cabinet Directive on Streamlining Regulation (CDSR).

The CSA 2001 regulatory project was subject to two different Government of Canada regulatory development policies and associated guidelines.

The 1999 Government of Canada Regulatory Policy was in effect when most of the regulatory development considered in this evaluation occurred. The Cabinet Directive on Streamlining Regulation (CDSR) came into effect on April 1, 2007. At this point, Phase I of the regulatory development was complete but Phase II was not, and it therefore was subject to the CDSR.

The objective of the first developmental policy, the Government of Canada Regulatory Policy (1999), was to ensure that the use of government's regulatory powers resulted in the greatest net benefit to Canadian society. TCMS’ Regulatory Reform Plan in support of CSA 2001 was created in 2004 to ensure that the expectations of the 1999 policy would be respected. The policy states that when regulating, regulatory authorities must ensure that:

• Canadians are consulted and have an opportunity to participate in developing or modifying regulations and regulatory programs.
• If a problem or risk exists, federal government intervention is justified and regulation is the best alternative.
• The benefits outweigh the costs to Canadians, their governments and businesses.
• Adverse impacts on the economy and employment are minimized and no unnecessary regulatory burden is imposed.
• International and intergovernmental agreements are respected, and full advantage is taken of opportunities for co-ordination with other governments and agencies.

Overall, as Table 18 demonstrates, all of the policy requirements have been met or are on track to be met.

---

37 The Community of Federal Regulators for Regulatory Excellence has given TCMS an award for its handling of the CSA 2001 Regulatory Reform Project.
<table>
<thead>
<tr>
<th>Policy requirements</th>
<th>TCMS output</th>
<th>Met/not met</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canadians are consulted and have an opportunity to participate in developing or modifying regulations and regulatory programs.</td>
<td>Consultations began in the spring of 2003 through the biannual Canadian Marine Advisory Council (CMAC) meetings; feedback was given and received via the MS website; draft regulations were published in the Canada Gazette.</td>
<td>Met</td>
</tr>
<tr>
<td>If a problem or risk exists, federal government intervention is justified and regulation is the best alternative.</td>
<td>Problems were identified through the individual Regulatory Impact Analysis Statements (RIAS) for each set of regulations.</td>
<td>Met</td>
</tr>
<tr>
<td>The benefits outweigh the costs to Canadians, their governments and businesses.</td>
<td>Some cost-benefit consultation documents were developed and shared with stakeholders; depending on the risk of the regulations, some of the RIASs included cost-benefit analyses.</td>
<td>Partial/too soon to tell</td>
</tr>
<tr>
<td>Adverse impacts on the economy and employment are minimized and no unnecessary regulatory burden is imposed.</td>
<td>While research was done to determine this in the development of the regulations, it is too soon to determine the impact of the regulations on the economy and/or employment.</td>
<td>Too soon to tell</td>
</tr>
<tr>
<td>International and intergovernmental agreements are respected, and full advantage is taken of opportunities for co-ordination with other governments and agencies.</td>
<td>One of the objectives of the regulatory reform was to harmonize regulations with the international conventions to which Canada is a signatory.</td>
<td>On track</td>
</tr>
</tbody>
</table>

The *Cabinet Directive on Streamlining Regulation* (CDSR) came into effect on April 1, 2007. One challenge in assessing the alignment of the regulatory framework with the CDSR is that neither the Government of Canada Regulatory Policy (1999) nor the CDSR provides a working definition of “streamlining.” Interviewees did not have a precise understanding of the word either.

Given that *CSA* is one of Canada’s oldest pieces of legislation, one of the key objectives of the regulatory reform was to “modernize and streamline” the new *Act*, along with the regulations that stem from it. The TCMS website states that the Program reviewed and restructured over 100 regulations. Through a review of Program files and interviews, our evaluation team confirmed that a number of regulations have indeed been consolidated, reorganized and/or modernized. For example:

- The *Vessel Clearance Regulations* now sets out, in one place, the documents required for vessel clearance. (The requirements to obtain these documents were previously found in more than 50 legislative provisions stemming from the old *Act.*)
- The *Voyage Classification System* has been consolidated, reducing the number of voyage classifications from eight to four.
Other regulations that were consolidated, reorganized and/or modernized include Load Line Regulations; Marine Personnel Regulations; Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals; Cargo, Fumigation and Tackle Regulations; Fire Safety Regulations; and Ships Registry and Licensing Fees Tariff Regulations.

There is consensus among stakeholders and staff interviewed on this subject that the new regulations are better organized. One stakeholder stated that the “regulations are clearer; having it all in [one] package helps.” However, according to another stakeholder “regulations are [simply] consolidated, not necessarily streamlined.”

**The Marine Safety Program’s level of consultation exceeded the requirements of the Government of Canada Regulatory Policy (1999).**

While the policy states that regulatory authorities must ensure Canadians are consulted and have an opportunity to participate in developing or modifying regulations and regulatory programs, in reality it sets the bar quite low. For example, to meet this requirement, the regulatory authority need only ensure that the regulation is posted in the *Canada Gazette* and that feedback is obtained. A review of Program documents and the CMAC website suggests that the level of consultation carried out by TCMS exceeded the consultation requirements of the Government of Canada Regulatory Policy (1999). TCMS began consultations before the publication of the regulations in Part 1 of the *Canada Gazette*; consultation typically starts after publication. According to Program documents, the intent was to consult with both internal and external staff and stakeholders so that everyone had the opportunity to comment on the development of the regulatory amendments, from conception through to the *Canada Gazette* process. TCMS used CMAC as the main forum for consultation since it meets twice a year (November and April) in Ottawa and normally twice a year in each TC region. A summary of this process, based on a review of Program documents, shows that the consultations proceeded as follows:

- In the spring of 2003, the national CMAC held a discussion on Vessel Registration and Tonnage Regulations.
- TCMS continued cross-country public consultations at national CMAC meetings in 2004 and 2005 for Phase 1 regulations.
- In the following years, consultations took place regarding several Phase 1 regulations, including (but not limited to) Aids to Navigation Protection Regulations; Pleasure Craft Regulations; Small Vessel Regulations; Competency of Operators of Pleasure Craft Regulations; Marine Personnel Regulations; Load Line Regulations; Fire Safety Regulations; Fishing Vessel Safety Regulations; and Environmental Response Regulations.
- Program documents from 2004 show that TCMS conducted some outreach sessions for the Fishing Vessel Regulations and Environmental Response Regulations.

---

38 *Canada Gazette* gives Canadians the opportunity to provide their comments on the proposed regulations that are published in the *Canada Gazette, Part I*. For each of the proposed regulations listed, there is a contact name from the relevant department or agency and a closing date for comments. Anyone who may be affected by the proposed regulations can also request background information from the issuing department.
**Canadian regulations are harmonized with international conventions and protocols.**

Canada has brought into force nine international maritime conventions.

The bringing into force of International Marine Organization (IMO) conventions and protocols dealing with maritime pollution, safety and security, liability, and compensation issues is a necessary step in implementing the coming into force of the CSA 2001, and in modernizing the regulatory framework. Canadian regulations must be aligned with the convention in order to be brought into force.

According to Program documents, the implementation of CSA 2001 and its associated regulations means Canada is now in a position to bring into force an additional nine international conventions: eight from the IMO and one from the International Labour Organization (ILO).39

Below is a list of conventions dealing with marine safety and the dates of ratification/accession.40


While the protection of marine environment is part of the TCMS mandate, it was not within the scope of this evaluation. However, here is a list of conventions dealing with pollution from ships and the dates of ratification/accession.

- Annexes IV, V and VI of the International Convention for the Prevention of Pollution from Ships (MARPOL) (reduced pollution from sewage and garbage; control of air emissions from ships)–March 26, 2010.
- International Convention for the Control and Management of Ships' Ballast Water and Sediments (control of invasive species in the water)–April 8, 2010.

---

39 It should be noted that Canada also ratified three conventions dealing with liability and compensation as they relate to passengers, cargo, pollution and property damage:
- The International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001 (otherwise known as the Bunkers Convention).

40 Departmental document.
Summary: Evaluation findings show that the consultations conducted by TCMS for the regulatory reform project met and, in some cases, exceeded the requirements of government central agencies. Information gathered also shows that the new regulatory framework is being aligned with international conventions and protocols. It is however too early to assess the impact of the new regulations on the overall safety performance of the sector.

Section 3–Evaluation Findings: Economy and Efficiency

In this section, the evaluation focuses on the extent to which TCMS is making the best use of its resources to achieve its outputs and outcomes. To this end, we examined whether TCMS is using the most efficient and effective approaches to achieving its outcomes. In doing so, we looked at three issues:

- Distribution of inspection effort
- Use of third-party inspections
- Trends in cost-recovery

3.1 Distribution of inspection effort

Small vessels and shipping do not seem to have received an inspection effort commensurate with their share of accidents.

Given that there are high accident rates among fishing vessels—especially small fishing vessels (15 tons or less)—the evaluation examined how much effort was spent conducting FSC inspections per vessel size category relative to the percentage of accidents for that same category.

Based on available data from TCMS, the analysis focused on the period October 2007 to December 2008, and therefore did not capture inspection activity in larger vessel categories, which is only undertaken every four years. For purposes of the analysis, vessels were categorized based on their tonnage: 0–15 tons; 16–150 tons; and greater than 150 tons. Both TCMS and TSB use these tonnage categories for reporting on mandatory inspection requirements and accident rates. The data outlined in Table 19 show that even though they were not mandated to be inspected, small vessels (0–15 tons) had more accidents relative to their share of inspections. They accounted for 27.5 per cent of shipping accidents but only 5.2 per cent of inspection efforts.
Table 19: Summary of inspection effort and shipping accidents, October 2007–December 2008

<table>
<thead>
<tr>
<th>Tonnage*</th>
<th>% of accidents*</th>
<th>% of inspections</th>
<th>Average inspection times(^{41}) (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-15 Tons</td>
<td>27.5%</td>
<td>5.2%</td>
<td>18.2</td>
</tr>
<tr>
<td>16-150 Tons</td>
<td>37.9%</td>
<td>70.6%</td>
<td>20.2</td>
</tr>
<tr>
<td>&gt; 150 Tons</td>
<td>34.6%</td>
<td>24.2%</td>
<td>110.2</td>
</tr>
</tbody>
</table>

These data exclude vessels of unknown tonnage as well as vessels inspected under delegated authority. Source: TCMS

Overall, the evidence suggests that despite the sizeable share of accidents among small vessels, TCMS did not focus a proportionate amount of inspection activity on them. The fact that commercial vessels under 15 tons (with some exceptions) are not required by law to be inspected and the fact that significant inspection resources are required to carry out mandatory inspections of vessels over 15 tons constitute the most likely reasons why TCMS has not focused on the smaller vessel population.

According to information from SIRS (Ship Inspection Reporting System), between October 2007 and December 2008, fishing vessels in general accounted for 53 per cent of inspected vessels. Small fishing vessels (15 tons or less) accounted for only one per cent of this total. This figure is not surprising since the inspection of fishing vessels 15 tons or less was not mandatory until the new Canada Shipping Act came into effect in July 2007. However, data suggests that small shipping vessels are not receiving a commensurate amount of inspection attention relative to the percentage of accidents in which they are involved. Table 20 compares the accident rates of small fishing vessels with their reported accident rate. It shows that such vessels represent one per cent of the inspection database (SIRS) while figuring at 17 per cent in TSB’s shipping accident database between October 2007 and December 2008.

Table 20: Accident rate compared to inspection rate for small and other fishing vessels, October 2007–December 2008

<table>
<thead>
<tr>
<th>Vessel Type</th>
<th>% of TSB reported shipping accidents</th>
<th>% in TCMS Inspection Data Base (SIRS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Fishing Vessels</td>
<td>46%</td>
<td>53%</td>
</tr>
<tr>
<td>Small Fishing Vessels (15 Tons or less)</td>
<td>17%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: TCMS and TSB Marine Statistics

\(^{41}\) The National Time and Activity Recording System (NTARS) at TCMS operates under a Comprehensive Process Concept. Unless otherwise stated, time recorded for each task code includes the full range of technical and administrative work activities carried out by either a Program Officer, Inspector or Administrative Support staff member, or combination thereof that is required to accomplish the task from beginning to end.
3.2 Use of third-party inspections

Monitoring effort by TCMS inspectors for delegated vessels is 62 hours less on average than the inspection effort for non-delegated vessels.

Some of the FSC inspection activity is delegated to classification societies in accordance with signed agreements between TCMS and these organizations. Under these agreements, classification societies play two roles: they are delegated the compliance inspection responsibilities of FSC and they provide expertise during shipbuilding to classify ships as being seaworthy.

The Delegated Statutory Inspection Program (DSIP) was created by TCMS to implement and manage the agreements with classification societies. Under CSA 2001, the authority to delegate FSC inspection activity is broader. Under the new Act, TCMS may now, in addition to classification societies, authorize individuals and other organizations to perform vessel inspections, audits, and/or to issue Canadian Maritime Documents (such as certificates). The Canadian Alternate Compliance Program (CACP) that is currently being piloted is expected to help implement this broader authorization.

A review of Program files shows that as of November 2009, 107 out of 260 vessels were fully delegated. To measure the expected savings from DSIP, we carried out an analysis that compared monitoring effort required (measured as hours of TCMS inspectors’ time) for delegated vessels to that of inspections for similar, non-delegated vessels. A sample of 38 delegated vessels and 71 non-delegated vessels of similar size and vessel type was created. The monitoring effort by TCMS inspectors for delegated vessels was found to be considerably less on average than the inspection effort for non-delegated vessels—62 hours less.

---

42 Lloyd’s Register of Shipping; American Bureau of Shipping; Germanischer Lloyd; Det Norske Veritas; Bureau Veritas.
43 The size of the sample was limited to the number of delegated vessels that could be placed into categories by type and tonnage that had a match with non-delegated vessels. Vessels in the sample of delegated vessels were selected to ensure that delegation handover inspections had been completed by 2006; this would ensure that the monitoring effort measured did not include any pre-delegation handover inspection effort.
Figure 5 presents the average inspection times for delegated and non-delegated inspections by tonnage and vessel type (68 tug boats; 39 bulk carriers; two oil tankers). When the individual timesaving for the 38 delegated vessels in this fairly small sample was totalled, it equalled 2,445 hours of inspection time—approximately two FTEs.

These results need to be considered in the context of other evidence suggesting that, beyond the narrowly defined inspection hours spent on monitoring of delegated vessels, DSIP may have strained the inspection resources of certain regions. Interview evidence suggests that in some regions, DSIP has added to the workload instead of decreasing it. It also suggests that because of TCMS’ commitment to bringing vessels into full compliance with regulations before they could be completely delegated, a higher level of effort at the outset of the program was anticipated. Nevertheless, the program has been in place for nearly nine years and it is reasonable to expect the initial spike in effort to have subsided.

44 While all vessels are tracked in TCMS databases under the delegated category, some have not been fully delegated to the classification societies.
45 The 2004 Service Line Review of TCMS states: “Delegation of inspections while having the potential to have a long-term resource benefit has a short-term increase in costs. The increase in cost is associated with the need to have a full assessment of a vessel prior to the [classification] society accepting the vessel. The assessment is expensive and exceeds the level of effort associated with major inspections.”
Monitoring of delegated inspection activities by TCMS has so far failed to meet the established targets.

TCMS set a target of 25 per cent monitoring for delegated vessel inspections. Two TCMS reviews of monitoring activity under DSIP found that “DSIP monitoring…did not meet the 25 per cent monitoring target set by the Marine Safety Executive.”\textsuperscript{46} In interviews we did as part of this evaluation, monitoring consistently came up as a problem area. Other issues regarding DSIP were also flagged. According to several interviewees, functional leadership and guidance from HQ was not as consistent as it should have been. In the absence of clear, national guidance and dedicated resources, the program has been implemented in an ad hoc manner in each region. There appears to be widely-shared agreement among staff interviewed in both HQ and the regions that while delegation is a “good idea,” the implementation of DSIP could have been handled better.

Interviews and Program documents also suggest that classification societies have demonstrated an inadequate level of understanding of Canadian regulations. Some interviewees stated that classification societies tended to apply their own standards. The safety implications of these potential gaps are unclear given that a gap analysis between the classification societies’ standards and TCMS’ requirements, is not available.\textsuperscript{47} However, classification societies are, under the current agreements, authorized to perform statutory functions on TCMS’ behalf.

The evaluators have recently been told that TCMS has made significant improvements in the area of delegated inspections over the past year. However given that the data collection for this evaluation ended in January 2010, these improvements will have to be reported in future assessments of the program.

**TCMS intends to increase the overall efficiency of its inspection regime by further extending the delegation of inspection authorities to others.**

With the coming into force of \textit{CSA 2001} in July 2007, TC may now, in addition to classification societies, authorize individuals and other organizations to perform vessel inspections, audits, and/or to issue Canadian Maritime Documents (such as certificates) on behalf of the Minister of Transport. Section 12 (1) of \textit{CSA 2001} states: “The minister may authorize any person, classification society or other organization to…carry out inspections under section 211 if the person determines that the person, classification society or other organization is qualified to…carry out the inspection.” Sections (10) 1(c) and 13 of the \textit{Act} also allow increased flexibility for such delegations of authority.

One example of this new approach is the Canadian Alternate Compliance Program (CACP)—a voluntary initiative that is currently in a pilot phase involving five towboat companies in the Pacific Region under the umbrella of the Council of Marine Carriers (CMC).

\textsuperscript{46} 2006 Review of Monitoring of Inspections Carried out under the DSIP RDIMS\# 1747248 and Review of Monitoring of Inspections Carried out under the DSIP (2004) RDIMS\# 964690.

\textsuperscript{47} The evaluators were told on several occasions that a gap analysis had been conducted but repeated efforts to locate it proved unsuccessful.
CACP will require operators to demonstrate they have ongoing and sound risk management practices in place in order to enter into the program. TCMS will do a detailed assessment of applicant practices by using a detailed risk assessment framework (RAF). Our review of the draft tool shows the assessment will include a review of practices and procedures for reporting accidents, safety and environmental protection plans, as well as others.

While programs like CACP are intended to result in a culture of “continual compliance” among lower risk operators able to demonstrate that they have sound risk management practices in place, CACP is an authorization program aimed at improving inspection services; its primary benefit is to increase the overall safety of the marine industry by increasing the overall efficiency of TCMS’ inspection regime. The intent is to have operators that are deemed qualified perform functions on behalf of TCMS, such as inspections. This would allow TCMS to shift the focus of its own inspection resources to areas of higher risk like small vessels, including fishing vessels and recreational boats, both of which have higher accident rates. Larger vessels with higher non-compliance and risk levels would be another sector that TCMS might focus on. According to one respondent interviewed on this subject “with an increase [of delegation] we can leverage and use our workforce better.” That would then is increase the overall level of marine safety.

Our evaluation research revealed the following issues regarding increased delegation to others:

- Surveys of stakeholders and staff showed that there is a view that TCMS has not fully realized the intent of the new Act, i.e. in taking advantage of the flexibilities afforded by CSA 2001 with respect to the broader application of delegations of authority. When we asked in our surveys “How satisfied are you with Transport Canada’s implementation of the new regulatory ability to authorize others to carry out inspections?” this question received low ratings from both staff (2.4 out of five or 48 per cent) and stakeholders (2.5 out of five or 50 per cent).
- Staff seem to have a lack of confidence in the situation. When our survey asked “Are you confident inspections carried out by others will ensure the safety of personnel and vessels?” they gave the second lowest rating to this question, as compared to all other questions in the survey: 2.2 out of five or 44 per cent.
- Stakeholders were somewhat more confident that TCMS’ move away from direct inspections would ensure safety. They rated the question 3.1 out of five, or 62 per cent. Interestingly, out of all questions on the survey, staff and stakeholders were most divergent on this question. As Figure 6 below demonstrates, 29 per cent of stakeholders rated their confidence level as 1 or 2 out of five (at the lowest end of the scale) compared to 64 per cent of staff.

---

48 Operators who demonstrate that they have sound risk management practices in place—one of the criteria for entry into the program—may be deemed lower risk and thus subject to less frequent inspections than those that do not qualify for the program. By developing ongoing practices to meet or exceed regulatory requirements, the expectation is that operators will move into a culture of “continual compliance.”

53
Figure 6: Level of confidence that inspections carried out by others will ensure the safety of personnel and vessels

<table>
<thead>
<tr>
<th></th>
<th>Stakeholders</th>
<th>Staff</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Not Confident)</td>
<td>16</td>
<td>31</td>
<td>35</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
<td>33</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
<td>14</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>24</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>5 (Very Confident)</td>
<td>16</td>
<td>5</td>
<td>15</td>
</tr>
</tbody>
</table>

Note: The percentages in the chart will not sum to 100% because of missing responses.

Source: DES Survey of Staff and Stakeholders.

According to Program files, implementing a risk-based inspection regime and the SMS tool will require the use of a different set of competencies for inspectors, including risk-analysis, communications skills, critical thinking and writing skills. This change in role may be the cause of an apparent scepticism in the inspector community. A number of interviewees pointed out that inspector buy-in will be crucial for success and the current lack of buy-in will need to be well managed if inspector support is important for the success of the new regime.

Finally, as discussed earlier in this section, our evaluation found that TCMS has not met its targets with respect to monitoring of other types of delegated inspection activities already in place. TCMS did not meet the 25 per cent annual monitoring target for its DSIP set by the Marine Safety Executive.49

3.3 Trends in cost-recovery

Table 21 presents the services for which TCMS charges fees. The cost recovery ratio of these fees for services is 9.1 per cent, slightly higher than the ratio for the department as a whole. Please note that the cost recovery ratio was lower in 2007–2008 than in 2004–2005.

Table 21: Marine Safety cost recovery based on fees (in $1,000s)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Revenue</td>
<td>Full Cost</td>
<td>Ratio: Revenue to Full Cost</td>
</tr>
</tbody>
</table>

49 2006 Review of Monitoring of Inspections Carried out under the DSIP RDIMS# 1747248 and Review of Monitoring of Inspections Carried out under the DSIP (2004) RDIMS# 964690.
<table>
<thead>
<tr>
<th></th>
<th>Transport Canada</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total: Transport Canada</strong></td>
<td>29,782</td>
<td>397,946</td>
<td>7.5%</td>
<td>31,839</td>
<td>399,277</td>
</tr>
<tr>
<td><strong>Marine Safety</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inspections, surveys, services</strong></td>
<td>7,917</td>
<td>88,243</td>
<td>9.0%</td>
<td>8,114</td>
<td>70,578</td>
</tr>
<tr>
<td><strong>OBS, construction standards, compliance labels</strong></td>
<td>209</td>
<td>682</td>
<td>30.6%</td>
<td>167</td>
<td>373</td>
</tr>
<tr>
<td><strong>Ship radio inspections</strong></td>
<td>48</td>
<td>1017</td>
<td>4.7%</td>
<td>18</td>
<td>1,016</td>
</tr>
<tr>
<td><strong>Total: Marine Safety</strong></td>
<td>8,174</td>
<td>89,942</td>
<td>9.1%</td>
<td>8,299</td>
<td>71,967</td>
</tr>
</tbody>
</table>

*Source: Transportation in Canada, 2007*

MS fees have not changed over time. This is of concern for two reasons:

1) They are an important source of needed program revenue, and

2) They serve to implement MS policy.

Low fees or free services, for example, could be used to encourage compliance or participation in programs. MS provides some services to the public for free and in some cases, for a nominal cost. This encourages participation or compliance on the part of the industry or the public. However, some of our interview respondents suggested that the fees TCMS charges for inspections have stayed lower than fees charged by classification societies for inspection services in order to create an economic incentive for vessel owners to choose TCMS inspections rather than those offered by the classification societies. There is some evidence that this is in fact occurring, making some eligible vessel owners hesitant to participate in “Delegation to Class.”
Section 4–Conclusions

The evaluation was to assess the relevance and performance of the Marine Safety Program Activity through examination of the outputs and outcomes achieved in each of the Program sub-activity areas, namely the Regulatory Framework and Safety Oversight sub-activities.

Evaluation research and findings support the conclusions that follow.

Relevance

Relevance is documented by examining both the rationale of a program and its alignment with government priorities, and federal roles and responsibilities.

The Marine Safety Program Activity aligns with TC’s legislated mandate and priorities.

Legal authority to address safety in marine transportation, commerce, recreational boating, and the marine environment in general is mandated to TC. The British North America Act of 1867 gave the federal government the responsibility for safe navigation and shipping. The principal legislation governing safety in marine transportation and recreational boating is the Canada Shipping Act, 2001 (CSA 2001). It mandates that the Minister of Transport protect the health and safety of individuals who participate in marine transport and commerce. Other responsibilities of the Minister of Transport, delineated by CSA 2001, include promoting safe recreational boating practices, promoting safe marine transportation practices, and protecting the marine environment from various shipping activities. TC’s Marine Safety Program (TCMS) is responsible for fulfilling the Minister’s mandate with respect to CSA 2001. For a complete list of marine transportation acts that impact TCMS’ work, see Annex 4.

The Marine Safety Program supports TC’s operational priority of strengthening transportation safety, as outlined in the 2009/10 Report on Plans and Priorities (RPP). A key element of this priority is the implementation of Safety Management Systems (SMS) domestically. According to Departmental strategic documents, TC views SMS as a way to improve transportation safety as the sector continues to grow. Specifically, TC aims to enhance “its oversight role by combining its traditional inspection program with the added ability to assess safety systems that companies have in place.”

Evaluation findings demonstrate that there is a continuing need to improve the safety of the marine transportation system to achieve departmental objectives and targets.

In addition to TCMS’ responsibility to Transport Canada’s legislated mandate and TC’s international responsibilities, there is a continuing need for TCMS to address marine safety issues. While the safety performance of the sector is improving, there is still a need to pursue oversight and regulatory activities to address safety issues.

50 Departmental strategic document.
Evaluation findings suggest that TCMS should place a greater focus on small vessels and fishing vessels when it comes to marine safety. Based on TSB recommendations, a need exists to increase the knowledge and use of safe operating procedures and practices among fishing vessel operators.

Recreational boating is another sector where the need for improvement is more acute. Indications are that recreational boaters have the largest number of marine fatalities. Information gathered during the evaluation suggests that due to problems in obtaining up-to-date data on deaths from recreational boating, TCMS has not set targets to address the frequency of these deaths.

**Performance (achievement of expected outcomes)**

The evaluation findings support the following conclusions regarding the achievement of the Marine Safety Program’s expected outcomes.

_Ultimate outcomes: safety and public confidence_

When it comes to the ‘safety of the marine transportation system’ objective, safety appears to have improved over the period covered by the evaluation, mostly due to the important reduction in total marine fatalities.

Evaluation findings show that two of the four targets TCMS set for itself in 2003 have been reached. There was improvement with respect to one target. One target was not reached.

- The target to reduce the five-year average of marine fatalities by 20 per cent was well exceeded, with a reduction of 36 per cent.
- The target of a 20 per cent reduction in the five-year average accident rate for foreign flag vessels was reached.
- The target of a 20 per cent reduction in the five-year average for the Canadian flag commercial accident rate was only partially met, as only an eight per cent reduction could be observed.
- A reduction of only four per cent could be observed in the number of reported marine injuries whereas the targeted level of reduction was 30 per cent.

Table 22 below summarizes the achievement of TCMS safety targets.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td># Marine fatalities</td>
<td>34.0</td>
<td>21.8</td>
<td>40%</td>
<td>20%</td>
<td>Yes</td>
</tr>
<tr>
<td># Marine fatalities,</td>
<td>29.2</td>
<td>20.2</td>
<td>31%</td>
<td>20%</td>
<td>Yes</td>
</tr>
</tbody>
</table>
The strongest success observed regarding Marine Safety was a reduction in the number of marine fatalities. From this perspective, the sector has never been safer. Not only was the performance target easily surpassed, but the number of fatalities reached a historic low in 2007, when only 14 marine fatalities were reported.

The targets set for reductions in the commercial accident rate were either met (foreign vessels) or partially met (domestic). No substantial progress was achieved regarding the reduction of reported marine injuries.

These results and the qualitative evaluation findings reported in Section 2 suggest that the difficulties in reducing the rate of commercial shipping accidents and the number of reported injuries are related to the safety performance of a specific sector, namely fishing vessels. TSB figures and our analysis in that same section show that fishing vessels account for 51 per cent of the recorded Canadian commercial shipping accidents. Furthermore, although the overall number of vessels involved in accidents has been decreasing, the percentage involving fishing vessels has remained more or less stable. The situation regarding these vessels is such that the TSB identified “the number of accidents involving loss of life on fishing vessels” as one of the issues on its March 2010 Watchlist. The solutions identified by TBS were directed both at industry and government (TCMS) with the industry needing to adopt and promote safe operating procedures and practices to increase safety knowledge of fishing vessel operators and the government needing to work with industry to improve training and awareness and to provide a stronger regulatory framework in support of these initiatives.

It should also be noted that although TC does not closely monitor and does not have specific targets for recreational boating, the largest number of fatalities related to marine safety occurs in this sector. The estimated 100 to 150 deaths per year for this sector are significantly higher than the number of deaths registered for commercial vessels.

There is a lack of current data to support an assessment of “public confidence in the marine transportation system” objective.

New public opinion research could not be conducted for this evaluation. Such research would have allowed us

---

### Safety indicators

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign flag accident rate excluding 1998</td>
<td>2.0</td>
<td>1.6*</td>
<td>20%</td>
<td>20%</td>
<td>Yes</td>
</tr>
<tr>
<td>Canadian flag commercial shipping accident rate (per 1,000 trips)</td>
<td>3.7</td>
<td>3.4</td>
<td>8%</td>
<td>20%</td>
<td>No</td>
</tr>
<tr>
<td># Marine injuries</td>
<td>81.2</td>
<td>77.7</td>
<td>4%</td>
<td>30%</td>
<td>No</td>
</tr>
</tbody>
</table>

* This is a five-year average as data for 2008 was not available.
to assess the level of public confidence in the marine transportation system, and
to determine the extent to which this confidence level could be attributable to the
performance of the Program.

Evaluation findings based on public opinion research conducted in the past suggest that between
2000 and 2005, Canadians’ confidence in the safety of the marine transportation system was high
and that more than 90 per cent of the public expressed confidence in the system. However, since
these polls were conducted, a new set of regulations was implemented and some events occurred
that could have influenced public perceptions regarding marine safety. It would therefore not be
reasonable, or useful, to assume that previous results are still relevant.

If public confidence is to remain as one of the criteria used to monitor performance in the area of
Marine Safety, steps should be taken to ensure that ongoing monitoring of this indicator occurs. If
the department is not in position to conduct such research, it should consider revisiting the
relevance of this criterion.

Intermediate outcome: compliance

Performance information on compliance does not allow the evaluation to determine if there is a
causal link between the program activities and the safety performance of the sector. However,
some conclusions can be reached about the effectiveness of the programs.

Inspections conducted under the Port Sate Control Regime appear to be having a positive
impact in reducing the foreign flag commercial accident rate.

Evaluation findings show that compliance—as observed through Port State Control (PSC)
inspections—increased significantly between 2001 and 2008. The percentage of inspected ships
with at least one reported deficiency decreased from 53 to 38 per cent during this period, and the
percentage of inspected ships that were detained fell from eight to four per cent.

Although it was not possible for this evaluation to isolate the impact of PSC inspections on
overall safety performance by conducting a quantitative statistical analysis, the observed decrease
in accidents involving foreign ships in Canadian waters is congruent with the trend towards
significantly higher compliance. The Canadian PSC inspection regime is based on risk.
Inspections systematically target vessels that are likely to be non-compliant based on a list of risk
factors such as age, flag and type of ship. Research conducted in other countries51 and presented
in the evaluation findings section strongly suggested that such an approach is effective in
improving compliance.

Therefore, considering the trends in safety performance and the trends observed in compliance, it
is reasonable to assume that at least a part of the success in reducing the foreign flag commercial
shipping accident rate to the targeted level can be attributed to the effectiveness of the PSC

51 Cariou, P; Mejia Jr, M.Q.; Wolff, F-C (2008). On the Effectiveness of Port State Control Inspections. Science
Direct Part E 44, 491-503.
inspection regime. This conclusion jibes with research conducted on similar inspection regimes in other countries.

**It is not possible to reach a clear conclusion regarding the effectiveness of inspections under Flag State Control in reducing the number of marine fatalities and the domestic accident rate. It is also difficult to measure the impact of the Port Warden Inspection Program and of the Small Vessels Monitoring and Inspection Program.**

Evaluation findings showed that between 2001 and 2006, the percentage of compliance for Canadian commercial shipping vessels inspected each year has been falling sharply while the total number of deficiencies (SI-07s) noted in the SIRS database more than quadrupled. Evidence gathered from interviews and our document review suggests that this increase might have more to do with changes in inspection work processes and how information is being recorded than with the real rate of compliance. For instance, the mere definition of a deficiency was not consistent over the period and SI-07 forms were used to report things other than deficiencies. In addition, evaluation findings also show that the inconsistency in the conduct of the inspections has been an area of concern. As such, we cannot meaningful conclusion regarding the impact, or lack thereof, of the SVMIP on safety.

Although the high compliance observed as a result of the Port Warden Inspection is congruent with the good performance related to marine fatalities and accidents, there is insufficient data to reach authoritative conclusions.

**Qualitative evidence suggests that an improvement in seafarers’ knowledge of regulations and safety procedures could improve the safety performance of the commercial marine sector. However, it is not possible to assess the extent of this potential improvement in terms of safety.**

Based on results from an investigation from the TSB, it is possible to conclude that some mariners may lack the skills required to operate modern bridge equipment, which could be the source of marine accidents, injuries or fatalities. However, it is not possible to estimate the extent to which the overall safety performance can be explained by this lack of knowledge. Evaluation findings regarding the numbers of certificates having been revoked suggest that seafarers incompetence is not a prevalent issue. Nevertheless, half of TC staff and stakeholders surveyed for this evaluation perceived the level of seafarers’ awareness or regulations to be very low or low, suggesting that there is room for improving seafarers’ knowledge.

**While it is too early to assess the impact or contribution of the new regulatory framework sub-activity on Marine Safety objectives and targets, data available from this evaluation provide a baseline from which to evaluate the impact of this new regime.**

The new or updated regulations stemming from CSA 2001 began to come into force in July 2007. As such, it is obviously too early to assess the impact of this sub-activity.

Performance information reported in the previous section of our conclusions provides the baseline against which the effectiveness of the new regulatory framework will be assessed. Our evaluation findings suggest that the compliance approach implemented so far has been most
effective in improving the safety of vessels over 15 tons, while fishing vessels, and small vessels in particular, exhibit the biggest need for safety improvement. Given that fishing vessels account for nearly half of the domestic commercial accidents and marine fatalities, and that small vessels are involved in a significant number of accidents each year, it is clear to us that the current trend toward a steady reduction in marine fatalities and commercial marine accidents could only be maintained or improved upon by focusing on the safety performance of fishing vessels and small vessels.

If the Department were to implement an approach to marine safety based on risk, made possible by a broader delegation of inspection authorities as well as the increased use of the SMS tool, this would allow for a more effective use of the Department’s resources as it strives to achieve its marine safety objectives. However, the effectiveness of any new approach to compliance will ultimately be determined by TCMS’ ability to focus on where the risk is and to maintain or improve upon the positive trends in safety results it set over the last decade.

It should be noted that under the Cabinet directive on streamlining regulation (CDSR), TCMS will be responsible for reviewing the success of its major regulatory changes every five years on an ongoing basis. To date, some guidance on the stated objectives of the regulations exists but no comprehensive monitoring system has been created.
Section 5 – Recommendations and Management Action Plan

5.1 Recommendations

- ADM / Safety and Security should improve the way TCMS documents, categorizes and analyses deficiencies under Flag State Control to enhance capacity to identify and target risk.

- ADM / Safety and Security should ensure that TCMS focuses greater attention on fishing vessel and small vessel safety in order to maintain or improve the trend of a steady reduction in marine fatalities and commercial marine accidents.

- ADM / Safety and Security should ensure that TCMS adopts a systematic approach to providing
  - Refresher training to inspectors that have been in the job for a while
  - Specialized training that focuses on the specifics of an inspector’s job (such as offshore drilling)

- ADM / Safety and Security should ensure that there is stronger and more consistent direction from HQ with respect to delegated activities and that effective monitoring takes place in future iterations of such activities.

- ADM / Safety and Security should ensure that a review of TCMS’ inspection fees is conducted with a view to finding ways to bring them closer to market rates for similar services.
5.2 Management Action Plan

It is recommended that the ADM / Safety and Security:

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Management Action Plan</th>
<th>Expected Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure that TCMS focuses more on fishing vessel and small vessel safety in order to maintain or improve the trend of a steady reduction in marine fatalities and commercial marine accidents.</td>
<td>Marine Safety will enhance its policies and programs for small commercial vessels, including fishing vessels. To this end, Marine Safety will develop inspection guidelines for small vessels.</td>
<td>Inspection guidelines for small fishing vessels (February 2011)</td>
</tr>
<tr>
<td></td>
<td>Marine Safety will also develop a renewed small vessel program that will focus, in its first stage, on small commercial vessels other than fishing vessels. Marine Safety has already developed the inspection guidelines for small commercial vessels other than fishing vessels.</td>
<td>A renewed small vessel program supported by a strong business plan – Rollout of the renewed program (April 2011)</td>
</tr>
<tr>
<td></td>
<td>Marine Safety will review and report on the small vessel program on an annual basis, beginning one year after the program launch. Expansion of the program to fishing vessels will be carefully considered.</td>
<td>Annual reporting on the small vessel program (April 2012)</td>
</tr>
<tr>
<td>Improve the way TCMS documents, categorizes and analyses deficiencies under Flag State Control to enhance its capacity to identify and target risk.</td>
<td>Marine Safety will pilot enhancements to the existing ship inspection database in order to standardize the collection and analysis of deficiencies on Canadian registered vessels. This enhancement uses a new process for recording and reporting deficiencies in order to simplify the reporting process for its inspectors, and to improve tracking and analysis of deficiencies by providing a uniform approach to recording inspection results. If this pilot is successful, TCMS will apply the process to all vessel inspections nationally. This enhanced system for recording and reporting deficiencies will allow TCMS to identify vessels or systems that have the highest number of deficiencies. This will greatly enhance the capacity of TCMS to identify risk.</td>
<td>New Reporting Process (January 2011)</td>
</tr>
<tr>
<td></td>
<td>Enhance Flag State Control database (March 2012)</td>
<td></td>
</tr>
<tr>
<td>Recommendation</td>
<td>Management Action Plan</td>
<td>Expected Completion Date</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Ensure that TCMS adopts a systematic approach to providing</td>
<td>and to target vessels or systems that require the greatest attention from TCMS Inspectors. TCMS will develop a new Flag State Control database to better capture this information. To aid in this process, TCMS will also develop a new form for recording inspection results, which will include standardized categories of deficiencies.</td>
<td>Development &amp; Delivery of Refresher Training (January 2011)</td>
</tr>
<tr>
<td>• Refresher training to its inspectors that have been in the job for a while</td>
<td>Marine Safety will, through policies, mandate that all powers and duties, appointments and other designations obtained by Marine Safety inspectors, be subject to a review for continuous proficiency and/or refresher training.</td>
<td>Development and Delivery of Specialized Training (March 2011)</td>
</tr>
<tr>
<td>• Specialized training that focuses on the specifics of an inspector’s job (e.g. offshore drilling)</td>
<td>Marine Safety will enhance its list of nationally organized “mandatory” and “specialized” training that make up the core training of Marine Safety inspectors. The listing will form the basis for a policy that shall clearly identify which training is organized nationally and training, that due to its localized scope is the responsibility of the region concerned.</td>
<td>Integration of tracking plan proposal (March 2011)</td>
</tr>
<tr>
<td>Ensure that there is greater leadership from HQ with respect to delegated activities and that effective monitoring takes place in the future iterations of such activities.</td>
<td>Marine Safety will submit for approval of the Minister of Transport, authorizations (Departmental delegation of Authority Instrument) under the Canada Shipping Act, 2001. Positions identified in the authority instrument will be responsible for the effective monitoring and leadership related to any delegated inspection activities as authorized to be carried out on behalf of the Minister.</td>
<td>Submit Delegation of Authority Instrument request to Minister of Transport for approval (March 2011)</td>
</tr>
<tr>
<td></td>
<td>A national functional leadership workshop is being organized and all headquarters and regional directors and managers responsible for delegated inspection activities will be required to attend. Development of roles and responsibilities of HQ staff</td>
<td>Organize a Functional Leadership Workshop - with attendance by all applicable HQ &amp; regional Directors and managers</td>
</tr>
<tr>
<td></td>
<td>A national re-alignment of headquarters directorates to more closely match the department’s Program Activity Architecture</td>
<td></td>
</tr>
<tr>
<td>Recommendation</td>
<td>Management Action Plan</td>
<td>Expected Completion Date</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>(PAA) structure will be presented to the National Human Resources Management Committee (NHRMC). Implementation of the new organizational structure will take place in 2011/2012.</td>
<td>(Winter 2010) Present Marine Safety re-alignment (Winter 2011) Implement new organizational structure (2011-2012)</td>
<td></td>
</tr>
<tr>
<td>Ensure that TCMS conducts a review of its inspection fees with a view to finding ways to bring them closer to market rates for similar services.</td>
<td>Develop project Terms of Reference and workplan (December 2011) Consultations with internal and external stakeholders (2011-2012) Develop Regulations (2012-2013) Implement new and updated fee structure (2013-2014)</td>
<td></td>
</tr>
<tr>
<td>The present Marine Safety initiative related to service standards, concession fees, and service fees will continue to be a priority for Marine Safety. Marine Safety will develop Terms of Reference for the project and submit to the ADM Safety and Security, a plan to bring inspection fees in line with market rates, Treasury Board Guidelines and the User Fees Act.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ANNEXES HAVE BEEN REMOVED AND ARE AVAILABLE UPON REQUEST

ANNEX 1 - STAKEHOLDER SURVEY

ANNEX 2 - STAFF SURVEY

ANNEX 3 - INTERVIEW GUIDE

ANNEX 4 - LIST OF MARINE TRANSPORTATION ACTS

ANNEX 5 - EXAMPLES OF REGULATIONS THAT HAVE BEEN CONSOLIDATED AND STREAMLINED