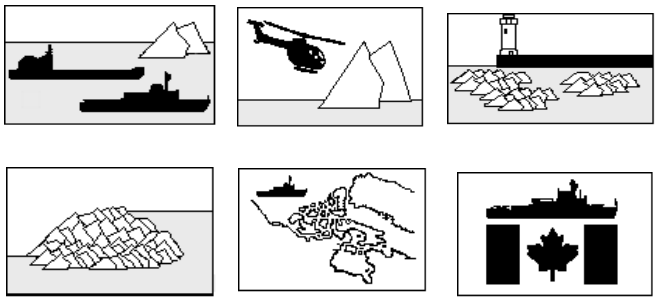
Fisheries and Oceans Canada
Pêches et Océans Canada

Coast Guard
Garde côtière

ICEBREAKING OPERATIONS

LEVELS OF SERVICE



ICEBREAKING PROGRAM

2001

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INTRODUCTION

The federal government provides icebreaking services in Canadian waters through the Canadian Coast Guard (CCG), a branch of Fisheries and Oceans Canada. Icebreaking Operations accounts for $74.2 million in planned operating expenditures in 1999/2000, approximately 6.75% of the entire DFO operating budget.

The current CCG icebreaking fleet consists of 5 dedicated icebreakers, 12 multi-tasked ice-strengthened vessels and one air cushion vehicle, which are operated out of 5 regions. There are two operational seasons for the icebreaking fleet:

- Summer Operations in the Canadian Arctic (from late June to October)
- Winter Operations on the East Coast, Gulf, Saint Lawrence River and Great Lakes (from mid-December to April or May)

Direction of these operations are carried out on a seasonal basis from the Regional Operations Centres, namely ICE ST. JOHN'S, ICE HALIFAX, ICE QUÉBEC, and ICE SARNIA (for Great Lakes and Arctic Operations).

DEVELOPMENT OF SERVICE STANDARDS

The CCG has had icebreaking service standards in place since the *Icebreaking Operations Levels of Service* (LOS) document was first published in October 1990. The Icebreaking Operations Data Information System (IODIS) was implemented in 1989 as a reporting system used to monitor the efficiency of the icebreaking fleet and to support the Icebreaking service standards. Performance reporting has been ongoing since 1990 comparing selected delivery targets against performance achieved. Icebreaking Reports are issued following each operational period, providing details on the services provided to clients.

The LOS document was updated and revised to be more easily understood by the client community and the providers of the service. This second edition was published in January 1993 and distributed widely throughout the CCG as well as to interested stakeholders. A client satisfaction survey was developed in 1996 and is used to solicit feedback from clients on the quality of the services provided. A toll-free number (fax only) is in place to receive these surveys.

In June 1997 the Joint Industry / CCG Icebreaking Task Force presented its final report to the Marine Advisory Board. This report included a section on "icebreaker requirements" which described the requirements for icebreaking services for three categories of users - commercial shipping, ferries and others. The report provided details in terms of the number of icebreakers required, their class, the location of deployment and the period for which their deployment is required. These "icebreaker requirements" have been incorporated in this document.

This publication provides clear definitions of icebreaking services that clients can expect to be provided with as well as delivery targets - the what, where, when, how much, and how fast. The document includes client-focused performance measures, which were developed through workshops held with representatives of commercial shipping, ferries and other government

departments. The document also contains detailed costs of icebreaking operations and a complaint and redress mechanism.

HISTORY OF ICEBREAKING IN CANADA

Icebreaking has played an important role in Canada's development since the 1800's. In 1842, the CHIEF JUSTICE ROBINSON was built in Niagara and was the first Great Lakes vessel designed for icebreaking, although she was a commercially owned passenger steamer. From 1906 in the Great Lakes, and possibly before, requests for icebreaking were dealt with by the chartering of local tugs for the clearing of harbour approaches and channels.

In 1855, the government decided that they had a role to play in the provision of services in support to shipping off the east coast. Two vessels, the QUEEN VICTORIA and the NAPOLEON III were used to tow sailing ships during the fall and spring between the ice floes to do salvage work and supply lighthouses. For four years, the government funded the ships, leaving their operation to a private contractor in return for fees of service. The user pay idea failed and in 1859 the ships were taken over by the government.

The Federal government of Canada has provided an icebreaking service off Prince Edward Island since 1873, beginning with the NORTHERN LIGHT, employed off the coast of Prince Edward Island. This vessel was followed by more capable icebreakers, the STANLEY and MINTO, to ensure a communication link with the rest of Canada during a vital period in Canada's history. While the icebreaker service was developing in Prince Edward Island similar developments were being made in the St. Lawrence river between Quebec and Montreal. In the St. Lawrence River Valley annual winter flooding was an impediment to commercial development. Flooding was caused by the formation of ice barriers or dams in the narrow points of the river. At the turn of the century, it was decided to try and alleviate this flooding by designing special ships whose purpose was to break up the ice at strategic locations in the river and keep the ice moving down the deepest channels. In 1904, CHAMPLAIN and MONTCALM were ordered from Scotland and performed this role effectively for many years.

A benefit of the flood control activities in the St. Lawrence River was the opening of the river to winter navigation. Other than a few exceptional days during abnormally severe weather conditions, the River has been kept open year-round as far as Montreal since the late 1950's. Extension of the navigation season to Montreal led to demands for icebreaker services throughout the Gulf of St. Lawrence and its ports. Icebreaking became more important in support of safety of shipping and increased the ability of Canada to trade with other maritime nations during the winter season.

Exploration of Canada's Arctic, which peaked in the late 1890's, plus the purchase of the CGS ARCTIC from the German government in 1904, precipitated the establishment of regular Arctic patrols in the 1920's during the short summer navigation season. The patrols were initiated to respond to a number of needs, including the re-supply of isolated outposts, provision of services to native settlements and in a broader sense, backing up Canada's claims to sovereignty over the Arctic archipelago. During the 1930's the port of Churchill was opened for grain export

shipment through Hudson Bay and required icebreaker services at the beginning and end of each season.

With "cold war" developments at the beginning of the 1950s, the first of the modern icebreakers were built to improve access to the north, supply defense sites and northern communities. In 1957, the Canadian Government undertook the annual resupply of Distant Early Warning Line sites spread across the Arctic, adding another dimension to the growing need for icebreaker services. In more recent years, the extraction of raw materials (ores, crude oil, natural gas) has caused increased commercial activity throughout Canadian Arctic waters. This in turn generated further demand for icebreakers capable of northern operations.

Since confederation, demand has steadily increased, consequently, icebreaking services have evolved and developed as well. What started as icebreaking "between the ice" has gradually increased to include navigating during the entire ice season, and including Arctic sovereignty as well. Consequently, icebreaking services have shifted from mainly a safety and communications based activity to include activities based on the extension of the navigation season for continued maritime trade in direct support to the economy of Canada.

LEGAL MANDATE

The authority for the icebreaking activities of the federal government can be found in the BNA Act of 1867. The undertaking accepted by Canada under the terms of union was delegated to the Department of Marine and Fisheries. The Department of Marine and Fisheries Act of 1892 gave the Department responsibility for, among other areas, winter communication between Prince Edward Island and the mainland by steamer and iceboat.

Specific responsibility for Dominion icebreakers and icebreaking was added in the 1930 legislation setting out the functions of the Minister of Marine. These functions were transferred to the Minister of Transport in 1936. A commitment to maintain access to the mainland, similar to the commitment made to Prince Edward Island, was made to Newfoundland under the Terms of Union in 1949. The Arctic Waters Pollution Prevention Act (AWPPA) (1970) also provides federal government responsibility for icebreaking and navigation through Arctic shipping zones. The Oceans Act (1997) transferred the responsibility for icebreaking activities to the Minister of Fisheries and Oceans.

PARTNERSHIPS

The icebreaking services described in this document are being delivered in partnership with other CCG/DFO programs, federal departments, other governments and agencies. These arrangements have two primary objectives; to increase the efficiency of service delivery and to provide more rationalized service delivery from the client's point of view.

The CCG Fleet Management business line provides appropriate, cost-effective sea and air platforms for the delivery of DFO programs. During the ice seasons, the Icebreaking Program provides secondary support to other DFO/CCG programs, namely

- search and rescue coverage in ice covered waters and response to marine emergencies;

- provision of Marine Navigation Services in ice-covered waters, i.e. repositioning winter spar buoys to mark channels;
- support to the Science and Conservation and Protection Programs on an opportunity basis.

Ice Routing and Information services are provided in partnership with the Canadian Ice Service, Environment Canada.

The federal government has established national and international agreements, both formal and informal, which delineate the operational commitment of icebreaking resources. One such treaty is the Canada/United States Icebreaking Agreement for the Great Lakes. It provides for the coordination of icebreaking activities of Canada and the United States in the Great Lakes and is intended to increase efficiency in the utilization of icebreaking resources in those waters, thereby increasing the capability to maintain open routes for maritime commerce to the mutual advantage of both countries. This arrangement includes designation of geographical areas within the Great Lakes and connecting waterways where each organization has principal responsibility for icebreaking.

SERVICES OUTSIDE OF THE APPROVED LEVEL OF SERVICE

Requests for icebreaking services in areas or timeframes outside those defined in this document will be reviewed with regard to such factors as the number of available CCG icebreaking resources, the priority of other commitments, the expected volume of shipping into and out of the area, the potential client base, the ice conditions, and funding availability. Applications should be made in writing to Manager, Icebreaking Program, 200 Kent Street, Ottawa, Ontario K1A 0E6

Any additional ice information services which may be required for the new service area would also be negotiated by the Icebreaking Program with the Canadian Ice Service.

COST RECOVERY FOR ICEBREAKING SERVICES

The Marine Service Fee (MSF) is a separate initiative for the Government of Canada to ensure that commercial users of Canadian Coast Guard marine navigation and icebreaking services contribute toward a portion of the cost of providing these services.

The federal budget of February 1995 called for cost recovery within Coast Guard, based on the principle that those who benefit directly from services provided at public expense should pay a fair share of the associated cost. Recommendations by the Standing Committee on Transportation of the House of Commons and the government's National Marine Policy set the context for Coast Guard's cost recovery plan, which includes the introduction of fees on the marine commercial shipping industry for both marine navigation and icebreaking services.

The Marine Navigation Services Fee was introduced in June 1996 following extensive consultation with the commercial shipping industry over the previous year. The Icebreaking Services Fee (ISF) was implemented on December 21, 1998. The commercial shipping industry and other stakeholders will continue to be consulted prior to the implementation of any changes

to the current cost recovery regime. Detailed information on the ISF can be located at the CCG Internet site: http://www.ccg-gcc.gc.ca/msf-dsm/main.htm.

Cost recovery mechanisms also exist for icebreaking services in areas/timeframes outside those defined in this document, a initiative separate from the ISF.

CLIENT CONSULTATION

The Canadian Coast Guard has several consultative forum in place for the marine industry; the Canadian Marine Advisory Council (Regional and National); Marine Advisory Board (MAB), Regional Advisory Boards (RAB). These are consultative bodies representing all areas of the marine industry and advises the Commissioner of the CCG on matters that fall under CCG responsibility. The Icebreaking Program also conducts client consultation prior to and following seasonal icebreaking operations. The CCG makes every effort to consult with groups most likely to be affected by changes in service standards. At the same time, it must also balance the needs of these user groups with considerations of the general public's interests.

DECLARATION OF QUALITY SERVICE

The Canadian Coast Guard and its employees are committed to delivering quality services within affordable resources. This commitment to service will be demonstrated through the following principles:

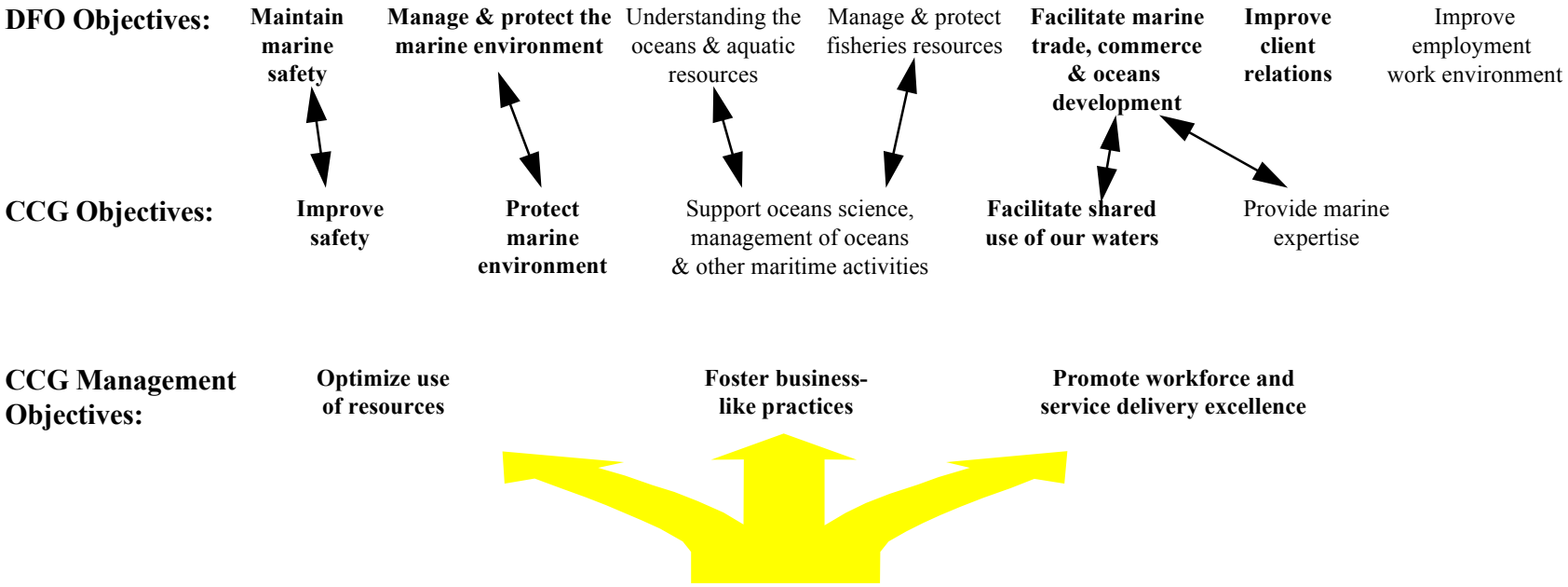
- *commitment to safety and protection of the marine environment*
- *responsiveness to client needs through consultation*
- *commitment to improvement*
- *professionalism*
- *honest and open communication*
- *integrity and trust*
- *fairness and equality*
- *commitment to people*
- *cost effectiveness*
- *responsibility and accountability*
- *quality programs and services*
- *ongoing commitment to creativity and innovation*
- *timely, accurate advice and information*

Strategic Framework
DFO/CCG/Icebreaking

DFO Mission: "To manage Canada's oceans and major waterways so that they are clean, safe, productive and accessible, to ensure sustainable use of fisheries resources and to facilitate marine trade and commerce."

CCG Mission: "The CCG will ensure the safe and environmentally responsible use of Canada's waters, support understanding and management of oceans resources, facilitate the use of our waters for shipping, recreation and fishing, and provide marine expertise in support of Canada's domestic and international interests."

Icebreaking Mission: "To provide icebreaking services of benefit to Canadian commerce, sovereignty, and riparian interests with regard to the marine environment, consistent with client needs and government expectatations."



Icebreaking Program contribution towards Departmental and Sectoral Objectives

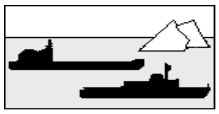
Mission: To provide icebreaking and related services of benefit to Canadian commerce, sovereignty and riparian interests with regard to the marine environment, consistent with clients needs and government expectations.

Vision: The CCG Icebreaking Program aims to be the International authority in cost-effective icebreaking services.

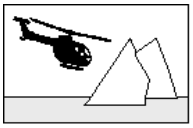
	HOW?		WHO?	WHAT DO WE WANT?	WHY?
INPUTS	ACTIVITIES	OUTPUTS		DIRECT OUTCOMES	ULTIMATE IMPACTS
Appropriations & Revenue (O&M, Capital) Employees Icebreakers Helicopters International agreements Stakeholders input	**Route Assistance** escort services organizing convoys freeing beset ships maintaining channels & tracks in shore-fast ice standing by for route assistance requests **Ice Routing & Information** ice information ice routing ice reconnaissance managing ice operations centres **Flood Control** flood control monitoring ice conditions & water levels to anticipate flood risks standing by for flood control **Harbour Breakouts** breaking out port approaches & clearing ice from wharf faces spring harbour breakouts assisting shipping at remote locations **Northern Resupply** **Arctic Sovereignty**	clients served ships escorted through ice open waterways and ports recommended routing ice charts ice jams cleared flooding prevented cargo delivered to northern sites Canadian presence R&D products	**Primary clients** commercial shipping ferries fishing vessels cruise ships ports fishing harbours riparian interests **Other beneficiaries** SLSA, OGDs civil authorities provinces & territories communities northern residents industry, general public, **Partners** CIS, USCG, MCTS, SAR, Fleet, OGDs TC (Marine Safety) Marine associations Ice pilots Scientific community **Others affected** police, ship building environmental groups maritime associations aboriginal groups Canadian Space Agency Radar Sat Int.	**client service** client satisfaction commercial vessels arrive on time and undamaged timely response to service requests no increase/reductions in V/L insurance continued winter/arctic commercial voyages predictability and reliability of cargo movements quality service quantity of service communication between client and service provider meeting LOS proactive to industry needs national security less property damage/shore erosion **behavioural change** ships loaded or in ballast before entering ice foreign captains aware of ice procedures decreased demand for services ice capable vessels used by shipping companies acceptance of convoys improved icebreaker planning acceptance of modern technology improved use of ice information and forecasting	**economic, social, cultural** internationally competitive more tonnage transported by sea continued reduced inventory costs support economic provision of goods to remote communities number of lives saved predictable level of service icebreakers used year round icebreaking fees implemented operate in a manner sensitive to arctic culture and their environment reduced damage to property & ships positive media exposure re sovereignty **environment, natural resource** avoid flood damage reductions of accidents continued support to new development **industry** economic activity industry growth open season to ship **regional** degree of flood damage support employment reduced cost of industry operations revenue from marine service fees **other** new Polar Code

ICEBREAKING OPERATIONS

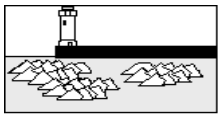
There are 6 sub-activities of Icebreaking Operations:



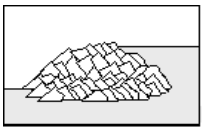
1) Route Assistance



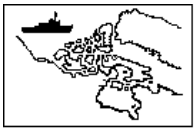
2) Ice Routing and Information Services



3) Harbour Breakout



4) Flood Control / Ice Management

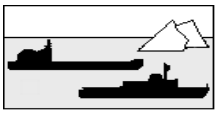


5) Northern Resupply

6) Arctic Sovereignty

Each sub-activity will be described under the following:

- **SERVICES PROVIDED**
- **CLIENTS**
- **PERFORMANCE TARGETS**
- **EFFECTIVENESS**



ROUTE ASSISTANCE

SERVICES PROVIDED

The Canadian Coast Guard will...

a) escort ships and organize convoys to travel through ice-infested waters,
b) free beset vessels to allow them to proceed,
c) maintain shipping channels and tracks in shore-fast ice, and
d) stand by in areas where requests for route assistance are likely,

...when requested and/or when the need is deemed to exist, and when resources are available.

Applicable Criteria

The following criteria must be considered in an operational context when deciding whether the service can be effectively and efficiently provided:

a) **ability** of the subject vessel to safely navigate in ice;
b) **experience** of vessel's master in ice navigation; and
c) **willingness** to cooperate and comply with routing advice.

CLIENTS

Direct beneficiaries of route assistance services include domestic and foreign commercial vessels, ferries, fishing vessels, Canadian and foreign government vessels and interested marine parties.

PERFORMANCE TARGETS

Extent of Services

Coverage
Waters of interest to Canada where the federal government has traditionally accepted responsibility for providing assistance. On a regional level, the primary geographic areas of operation are listed in the Block Commitments Tables and Chartlets in Annex A.

Availability
During winter, from about mid-November to the end of June, icebreaking services are provided on the Labrador Coast, East Coast, Gulf of St. Lawrence, the St. Lawrence and Saguenay Rivers and in the Great Lakes.

During the summer months, from about July to November, icebreakers are deployed to the Canadian Arctic.

For specific details, refer to the Block Commitments Tables and Chartlets.

Quality of Services

Reliability
All service requests will be actioned within this service situation.

Readiness
Canadian Coast Guard icebreakers will be maintained in a state of readiness whereby they may respond to a service request within 1 hour.

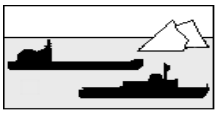
Response Time
Under average ice conditions, a Canadian Coast Guard icebreaker will be on scene to provide route assistance within the hours stipulated below:

Canadian Arctic	10 hrs
East Coast of Newfoundland	8 hrs
Gulf of St. Lawrence	12 hrs
St. Lawrence and Saguenay Rivers	5 hrs
Great Lakes	8 hrs

These hours shall be calculated from the time that the service is required (which is not necessarily the time that the request for service is received) until the icebreaker arrives on scene.

There are several variables which will affect the response time for route assistance requests:

a) location of the vessel requiring assistance;
b) conditions of ice and weather ;
c) availability of an icebreaking resource;
d) proximity of an icebreaker to the vessel (transit time); and
e) capability of the assigned icebreaker.



Applicable Priorities
The priorities listed are those that must be considered in an operational context when delivering the service:

1) all distress and emergency situations take precedence;
2) service requests from ferry services provided in accordance with the Terms of Confederation/Union will be given priority; other ferry services will receive priority as deemed appropriate by the CCG;
3) ships with vulnerable cargoes (i.e. pollution potential of cargo, dangerous goods, perishable) and vessels transporting cargo which is vital to the survival of communities;
4) marine traffic and fishing vessels**.**

Limitations of Services
The limitations which may affect delivery of route assistance services are:

a) **weather restrictions:** services may be reduced when, in the opinion of the CCG, current and forecast meteorological conditions will not permit successful delivery of the services;
b) **severity of ice season:** services may be reduced when, in the opinion of the CCG, current and forecast ice conditions will not permit successful delivery of the services;
c) **physical restrictions:** services will not be provided when, in the opinion of the CCG, hydrographic and/or geographic features of the area under consideration prevent safe operation by a CCG unit;
d) **safety restrictions:** services will not be provided when, in the opinion of the CCG, conditions would unduly endanger CCG crew, ships or equipment, and/or those requesting the services; and
e) **availability of resources:** services will be provided when sufficient CCG units are available.

<u>Quantity of Services</u>

Client Benefits / Impacts:[1]

- ships reach destination;
  - # of requests for escort service - 724 total (646 winter, 78 summer)
  - # of vessels escorted,
    - ⇒ high risk cargo vessels (tankers) - 126 total (106 winter, 20 summer)
    - ⇒ other commercial vessels - 390 total (341 winter, 49 summer)
    - ⇒ ferries - 135 total (134 winter, 1 summer)
    - ⇒ fishing vessels - 52 winter
    - ⇒ other vessels - 44 total (37 winter, 7 summer)
- on-schedule arrivals/departures;
  - zero complaints about arrival time
  - average response time for escort service requests - 2.65 hours winter, 13.57 summer

[1] All statistics used are for 1996/97 unless otherwise specified.

- reduced risk of ice damage to ships in transit through ice-infested waters;
  - # of ice related incidents as per incident report from the Transportation Safety Board

	1997	1996	1995	1991-95 average
Ice Damage	21	22	11	30

Operational Outputs

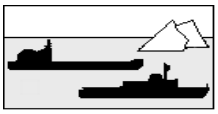
- icebreakers operated in escort service tasks;
  - # of icebreakers utilized by class,
    - ⇒ 1 x 1300
    - ⇒ 4 x 1200
    - ⇒ 6 winter, 1 summer x 1100
    - ⇒ 2 x 1050
    - ⇒ 3 x 1000
    - ⇒ 1 x 600,
  - # of ships escorted / hours of escort by class of icebreakers,

	# of escorts		# of hours	
	winter	summer	winter	summer
1300	19	8	233.29	597.22
1200	250	55	2380.21	3927.53
1100	274	7	3344.2	494.15
1050	68	-	977.54	-
1000	8	-	99.74	-
600	1	-	3.6	-

EFFECTIVENESS

Strategic Outcomes

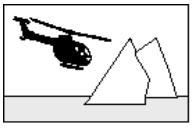
- enhanced socio-economic performance of communities;
  - tonnage moved by escorted vessels,
- contribution to the constitutional requirements of Confederation through the provision of escort services to designated interprovincial ferry systems;
  - 135 ferries escorted,
- environmental risk is reduced;
  - # of environmental incidents,
  - 126 high risk vessels escorted.



Link to Departmental Objectives & Key Results

This activity directly contributes to three of the department's long term objectives:

- *Maintain maritime safety* - reduced risk of ice damage to ships in transit through ice-infested waters;
- *Manage and protect the marine and freshwater environment* - protection of the marine environment by escorting ships, including petroleum tankers and other vessels carrying dangerous goods, through ice-infested waters; and
- *Facilitate marine trade, commerce and ocean development* - decreased transit time for marine traffic traveling through ice-infested waters (irregular delays in shipping increase transportation costs, enhancement of clients' operational/economic performance, improved marine trade and commerce; and security of maritime transportation not normally requiring icebreaker assistance (the mere presence of icebreakers and the "potential" for assistance when needed would encourage marine traffic to transit ice-infested waters).



ICE ROUTING AND INFORMATION SERVICES

SERVICES PROVIDED

The Canadian Coast Guard will...

a) provide ice information to interested parties,
b) undertake ice reconnaissance services to survey and forecast ice conditions (tactical, close tactical and strategic),
c) provide ice information broadcasts and ice routing advice to ships requiring such information via Marine Communication and Traffic Services (MCTS) centres, and
d) manage Ice Operations Centres during periods where ice constitutes a marine hazard,

...when the need for it is deemed to exist by Coast Guard, and/or if it is requested.

Applicable Criteria:

In order to receive ice routing advice and information, vessels must have appropriate electronic equipment (radios and facsimile machines) in proper working condition. Service may also be adversely affected by prevailing radio atmospheric conditions.

CLIENTS

Direct beneficiaries of ice routing and information services domestic and foreign commercial vessels, ferries, fishing vessels, Canadian and foreign government vessels and interested marine parties requiring ice condition information.

PERFORMANCE TARGETS

Extent of Services

Coverage
Waters of interest to Canada where the federal government has traditionally accepted responsibility for providing information. On a regional level, the primary geographic areas of operation are listed in the Block Commitments Tables and Chartlets in Annex A.

Availability
During winter, from about mid-November to the end of June, recommended routings and ice information are provided on the Labrador Coast, east Coast, Gulf of St. Lawrence, the St. Lawrence and Saguenay Rivers and in the Great Lakes.

During the summer months, from about July to November, ice information is provided in the Canadian Arctic.

Quality of Services

Reliability
All service requests will be actioned by the Canadian Coast Guard.

Readiness
The Canadian Coast Guard will provide ice routing and information services on a continuous basis via ice operations centres during the ice seasons.

Response Time
The Canadian Coast Guard will respond to a request for ice routing and/or information within 1 hour of the time requested.

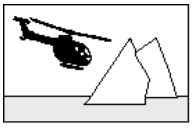
Applicable Priorities:

1) vessels which are entering or in ice-infested waters will be given ice routing advice on a priority basis;
2) ice information broadcast messages for vessels transiting Canadian waters; and
3) strategic ice information for voyage planning.

Limitations of Services
Successful delivery of services requires electronic equipment (e.g. radios, facsimile machines) which is in proper working condition to receive the information available, and which may depend upon prevailing radio atmospheric conditions.

Quantity of Services

Client Benefits / Impacts
- reduced requirement for icebreaker support;
  - # of ice routing/information messages disseminated - 6424 in winter, 575 in summer,
  - % of vessels complying with ice routing advise
  - # of ice information broadcasts.
- on-schedule arrivals/departures;
  - # of complaints about ice routing and information
- reduced risk of damage to ships;
  - # of ice related incidents as per incident report from the Transportation Safety Board



Operational Outputs

- units operated in ice information service tasks;
  - # of aircraft utilized - 2,
  - # of helicopter sorties,
  - # /hours of aerial reconnaissance flights - Canice 3 (C-GCFR) 140 flights/ 712 hrs, 3 min,

EFFECTIVENESS

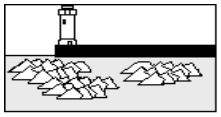
Strategic Outcomes

- enhanced socio-economic performance of communities;
  - tonnage moved by vessels transiting the area,
- environmental risk is reduced;
  - # of environmental incidents,

Link to Departmental Objectives & Key Results

This activity directly contributes to two of the department's long term objectives:

- *Maintain maritime safety* - reduced risk of ice damage to ships in transit through ice-infested waters;
- *Facilitate marine trade, commerce and ocean development* - by providing ice routing assistance to vessels in transit through hazardous ice-infested waters and by providing tactical and strategic ice reconnaissance information to commercial traffic, thereby supporting effective voyage planning and reducing delays caused by vessels beset in ice, and reducing the demand for other icebreaking services.



HARBOUR BREAKOUTS

SERVICES PROVIDED

The Canadian Coast Guard will provide icebreaking services to permit more intensive use of both public and private marine infrastructures, facilities and equipment by...

a) breaking out approaches and clearing ice from wharf faces of port terminals and facilities,
b) assisting shipping within ports and at marine facilities, by keeping ice clear of barge operations and the ship at anchor, and by streaming petroleum off-loading hoses, and
c) breaking out harbours to facilitate acceleration of ice clearance at the end of the ice season,

...when requested and/or when the need is deemed to exist, and when resources are available.

Applicable Criteria

Consideration will be given to the importance or volume of marine traffic and the ability of ships/fishing vessels to proceed once clear of the facility.

The Canadian Coast Guard will schedule requests efficiently in order to service a series of neighbouring harbours, ports and/or facilities.

CLIENTS

Direct Beneficiaries of this sub-activity include domestic and foreign commercial vessels, ferries, fishing vessels, ferry terminal operators, St. Lawrence Seaway Authority, owners and operators of the Canadian marine ports and harbours infrastructure, fish processing companies and communities dependent on these services.

PERFORMANCE TARGETS

Extent of Services

Coverage
See Block Commitments for more detailed information.

Availability
Services will be provided when sufficient CCG resources are available and when no appropriate commercial alternatives are available to the port authority. Under these conditions, services will be normally provided as noted in the Block Commitments.

Quality of Services

Reliability
All service requests will be actioned within this service situation.

Readiness
Canadian Coast Guard icebreakers will be maintained in a state of readiness whereby they may respond to a service request within one hour.

Response Time
Under average ice conditions, a Canadian Coast Guard icebreaker will be on scene to provide icebreaking services within the hours stipulated below:

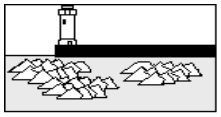
Canadian Arctic	10 hrs
East Coast of Newfoundland	8 hrs
Gulf of St. Lawrence	12 hrs
St. Lawrence and Saguenay Rivers	5 hrs
Great Lakes	8 hrs
All Fishing Harbour Breakouts	24 hrs

These hours shall be calculated from the time that the service is required (which is not necessarily the time that the request for service is received) until the icebreaker arrives on scene.

Applicable Priorities:

1) all distress and emergency situations take precedence;
2) ferry terminals that support services provided in accordance with the Terms of Confederation/Union will be given priority for service requests; other ferry terminals will receive priority assistance, as deemed appropriate by the Canadian Coast Guard;
3) priority will be given to requests where provision of services will maximize the use of the port.
4) service will be given to fishing harbours when it is considered to be most effective, ideally, at the end of the ice season.

Limitations of Services
The limitations which may affect delivery of harbour breakouts are the same as for route assistance.



Quantity of Services

Client Benefits / Impacts

- vessels can access and egress harbours and ports;
  - # of ports serviced
    - ⇒ 72 commercial
    - ⇒ 20 fishing
  - 326 requests for harbour breakouts,
  - # of breakouts done,
    - ⇒ 293 commercial
    - ⇒ 33 fishing
- harbour and port shutdowns minimized;
  - average response time - 8.94 winter, .27 summer
  - no complaints about response time

Operational Outputs

- ice breakers utilized for harbour breakouts;
  - # of ice breakers available by class,
    - ⇒ 4 x 1200 winter, 2 x 1200 summer
    - ⇒ 6 x 1100
    - ⇒ 2 x 1050
    - ⇒ 4 x 1000
    - ⇒ 1 x 600
  - hours of harbour breakouts
    - ⇒ commercial - 2243.41 winter, 28.81 summer
    - ⇒ fishing - 417.69 winter

EFFECTIVENESS

Strategic Outcomes

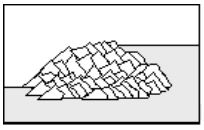
- enhanced economic performance of harbours and ports;

Link to Departmental Objectives & Key Results

This activity directly contributes to one of the department's long term objectives:

- *Facilitate marine trade, commerce and ocean development* - increased access to marine facilities; reduced risk of ice damage to structural components of ports and marine facilities; maintenance of approaches to SLSA locks to prevent unscheduled closure of the system; and early breakout of harbours permits fishermen to begin their fishing season earlier and equalizes access to fish among inshore fisheries.

Icebreaking is important for the maintenance of maritime commerce and the consequent industrial and port employment of these regions. Without icebreaking, there would be higher transportation costs and increased capital costs for transportation infrastructure and storage facilities. Also, because harbour breakouts can often be scheduled in advance, services support the efficient use of public resources by reducing the amount of work needed for route assistance.



FLOOD CONTROL / ICE MANAGEMENT

SERVICES PROVIDED

The Canadian Coast Guard will provide flood control in areas prone to or threatened by flooding by...

a) monitoring ice conditions and water levels in anticipation of flood risks,
b) preventing formation of ice jams and excessive build-up of ice in areas considered prone to or threatened by flooding,
c) providing icebreaker services to facilitate ice flow during spring break-up,
d) standing by in areas prone to excessive buildup of ice, and
e) constructing and positioning ice booms and artificial ice islands to encourage the formation of an ice cover outside the main shipping channel in winter.

...when requested and/or when the need is deemed to exist, and when resources are available.

Applicable Criteria

Consideration will be given to taking early preventative action to alleviate potential risk to life, property or the environment.

CLIENTS

Ice management services benefit owners and users of property in specific flood risk areas.

PERFORMANCE TARGETS

Extent of Services

Coverage
Waters of interest to Canada where the federal government has accepted responsibility for providing flood control assistance. On a regional level, the primary geographic areas of operation are listed in the Block Commitments Tables and Chartlets in Annex A.

Availability
See Block Commitments in Annex A.

Quality of Services

Reliability
All service requests will be actioned within this service situation.

Readiness
Canadian Coast Guard Icebreakers will be maintained in a state of readiness whereby they may respond to a service request within 1 hour.

Response Time
Under average ice conditions, a Canadian Coast Guard icebreaker will be on scene to provide flood control services within the hours stipulated below:

Upper St. Lawrence River and its tributaries	5 hrs
St. Clair/Detroit River System	8 hrs

These hours shall be calculated from the time that the service is required (which is not necessarily the time that the request for service is received) until the icebreaker arrives on scene. The Canadian Coast Guard will schedule requests for flood control in other navigable waters subject to the availability of resources and the urgency of the situation.

Applicable Priorities:

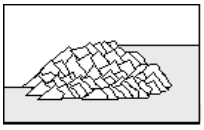
1) all distress and emergency situations take precedence.
2) when the risk of flooding is high, icebreakers will stand by in strategic areas.

Limitations of Services
The limitations which may affect delivery of flood control services are the same as for route assistance services.

Quantity of Services

Client Benefits / Impacts

- reduced risk of damage to property;
  - # of complaints,
- reduced risk of damage to ships;
  - # of vessels damaged,



Operational Outputs

- icebreakers operated in ice management and flood control tasks;
    - # of icebreakers, helicopters, vehicles utilized,
        - ⇒ 2 x 1200
        - ⇒ 3 x 1100
        - ⇒ 2 x 1050
        - ⇒ 1 x 1000
        - ⇒ 1 x ACV,
        - ⇒ 6 helicopters
        - ⇒ 5 vehicles
    - 867.49 hours provided to ice management service by icebreakers, (6190.16 on standby)
    - # of monitors, cameras, sensors utilized for monitoring ice conditions
    - # of ice retention booms deployed

EFFECTIVENESS

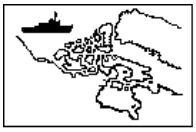
Strategic Outcomes

- enhanced property use along areas prone to flooding;
    - narratives,
- environmental risk is reduced;
    - estimated $ worth of damage due to flooding,

Link to Departmental Objectives & Key Results

This activity directly contributes to three of the department's long term objectives:

- *Maintain maritime safety* - reduced risk to life and property by the prevention of ice conditions that lead to flooding;
- *Manage and protect the marine and freshwater environment* - reduced risk to the marine environment by the prevention of ice conditions that lead to flooding;
- *Facilitate marine trade, commerce and ocean development* - improved land use along rivers is made possible through reduced danger of flooding and reduced risk of ice damage to structural components of bridges and marine facilities, such as the Quebec Bridge.



NORTHERN RESUPPLY

SERVICES PROVIDED

The Canadian Coast Guard will transport dry cargo and fuel during the annual resupply of Northern settlements and military sites when commercial carriers are not available, when requested and/or when the need is deemed to exist, and when resources are available.

Applicable Criteria:

a) all cargo transportation will be subject to cost recovery.

CLIENTS

Direct Beneficiaries of this activity are Arctic communities, indigenous people, and federal and territorial governments.

PERFORMANCE TARGETS

Extent of Services

Coverage
Waters of the Northwest Territories north of 60 degrees, not serviced by commercial carriers. Refer to the Block Commitments for more details.

Availability
Dry cargo and fuel transportation will be provided on an as required basis between July and October.

Quality of Services

Reliability
All dry cargo and fuel will be delivered as per negotiated agreements.

Readiness
Not applicable to cargo movement operations.

Response
Not applicable to cargo movement operations.

Applicable Priorities
All distress and emergency situations take precedence over the provision of normal services.

Limitations of Services
The limitations which may affect delivery of northern resupply support are:

a) **weather restrictions:** services may not be provided when, in the opinion of the Canadian Coast Guard, current and forecast ice and meteorological conditions will not result in the successful delivery of the services;
b) **safety restrictions:** cargo services will not be provided when, in the opinion of the Canadian Coast Guard, conditions will unduly endanger CCG crew, ships or equipment and/or those requesting the services; and
c) **cost restrictions:** provision of services will be on a cost-recovery basis, including the direct administration costs, the direct costs of the transportation services provided, including the Department's direct costs.

Quantity of Services

Client Benefits / Impacts
- communities and military sites in the Eastern Arctic are re-supplied by sea;
  - # of communities and military sites serviced – 2 (Pelly Bay, Eureka)
  - average tonnage delivered for resupply activity (tonnes)

Operational Outputs
- icebreakers operated in Northern Resupply tasks;
  - # of icebreakers utilized by class,
    $\Rightarrow$ 2 x 1200
  - 1222.73 hours provided by icebreakers,


EFFECTIVENESS

Strategic Outcomes
- enhanced socio-economic performance of the Arctic communities serviced.

Link to Departmental Objectives & Key Results

This business line and its activities directly contribute to three of the department's long term objectives:
- *Maintain maritime safety* - coordination/direction of vessels operating in Arctic waters reduces the risk of ice damage; and
- *Manage and protect the marine and freshwater environment* - protection/prevention of damage to the environment.

SOVEREIGNTY

SERVICES PROVIDED

The Canadian Coast Guard will...

- **a)** support a Canadian presence in the Arctic, to respond to specific sovereignty challenges identified by the Canadian Government
- **b)** assist and support ships making Arctic voyages and exploratory or demonstration voyages in Canadian Arctic shipping safety zones,
- **c)** participate in the support to user communities and local population through the conduct of various program activities;
- **d)** maintain effective control over foreign navigation; and
- **e)** provide support to other government departments, agencies and organizations in ice-infested waters,

...when requested and/or when the need is deemed to exist, and when resources are available.

Applicable Criteria

All services will be subject to the terms of a **memorandum of understanding** (MOU), including provisions for full cost recovery for dedicated service, incremental costs for ship time, or cost sharing for joint projects. Accommodation, including meals, laboratory space and equipment, is also provided on a cost recovery basis.

CLIENTS

Canada and the Canadian public, commercial shipping, the marine community, provincial and territorial governments, other government departments, agencies or organizations.

PERFORMANCE TARGETS

Extent of Services

Coverage
Waters of interest to Canada where the federal government has (traditionally) accepted responsibility for providing assistance.

Availability
Services will be provided subject to availability of CCG resources.

Quality of Services

Reliability
All service requests will be actioned within this service situation.

Readiness
The Canadian Coast Guard will respond to service requests, as defined within the terms of a memorandum of understanding (MOU).

Response
The Canadian Coast Guard will respond (on scene) to service requests, as defined within the terms of a memorandum of understanding (MOU).

Applicable Priorities
The priorities listed are those that must be considered in an operational context when delivering the service:

1) all distress and emergency situations take precedence; and
2) Transport Canada and government requirements will be met on a priority basis.

Limitations of Services
The limitations which may affect support to other government departments and agencies are:

a) **weather restrictions:** services may not be provided when, in the opinion of the Canadian Coast Guard, current and forecast ice and meteorological conditions will not result in successful delivery of services;
b) **physical restrictions:** services will not be provided when, in the opinion of the Canadian Coast Guard, hydrographic and/or geographic features of the area under consideration prevent safe operation of a Coast Guard unit; and
c) **safety restrictions:** services will not be provided where, in the opinion of the Canadian Coast Guard, conditions will unduly endanger CCG crew, ships or equipment, and/or those requesting the services.

Quantity of Services

Client Benefits / Impacts

- maintenance of a Canadian presence in the Arctic and in isolated areas;
  - 34 requests for sovereignty support

Operational Outputs

- icebreakers operated in sovereignty support;
  - # of icebreakers utilized by class,
    - ⇒ 1 x 1300
    - ⇒ 1 x 1200
  - 1140.25 hours provided by icebreakers,


EFFECTIVENESS

Strategic Outcomes

- maintenance of a Canadian presence in the Arctic and in isolated areas
- enhanced regional socio-economic development; equity, access, protection of indigenous culture;
- protection of the environment

Link to Departmental Objectives & Key Results

This business line and its activities directly contribute to two of the department's long term objectives:

- *Maintain maritime safety* - coordination/direction of vessels operating in Arctic waters reduces the risk of ice damage; and
- *Manage and protect the marine and freshwater environment* - protection/prevention of damage to the environment by providing control and assistance to ships making exploratory voyages in the Canadian Arctic.

This subactivity of traffic monitoring and support contribute to Canadian sovereignty in the Arctic, a general government objective. In particular, this service supports the objectives of responding to sovereignty concerns over territorial, political and economic independence and national unity and culture. The presence of Canadian Coast Guard ships, crews and equipment is a positive measure in that it elicits recognition of Canadian sovereignty, through requests for, dependence on, efficient government support to authorized foreign ship transits. Historic occupancy and the ability to monitor and manage activity in an area are sovereignty characteristics exercised by Canadian Coast Guard icebreaking operations.

BLOCK COMMITMENTS

Background

In AUG 89, the '*Program Evaluation Study Of The Icebreaking And Arctic Operations Subactivity Of The Marine Component Of Transport Canada'*, was published by Sypher:Mueller International Inc. The study recommended an analysis of icebreaking "Block Commitments" as an approach to understanding the nature of demand and the interaction between capacity and demand. With the development and use of Icebreaking Block Commitments within the Levels of Service framework, more effective monitoring and forecasting of demand and icebreaking capacity can be done.

Icebreaking Block Commitments

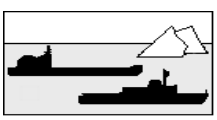
The icebreaking program has developed from the historical response to client demands and expectations. The present LOS is a representation of the contemporary CCG response to these demands and expectations. The response results in a series of predictable and measurable taskings or "block commitments" for Coast Guard icebreaking services. A block commitment is a requirement for a Canadian Coast Guard icebreaking service by an identified client or client group in a specific geographic area and in a defined time period. Ideally, the demand can be measured in terms of icebreaker days for a specific type of icebreaker.

The following tables were developed with assistance from regional ice superintendents. The tables include:

Area Number -A three character code to identify the block commitment area. The first character identifies the Region where the service was performed.
Area Name -Name used to identify the block commitment area.
Description of Area - Description of the block commitment area.
Period -This identifies the period when the icebreaking service is required for that area.
Service -This identifies the icebreaking service to be provided, as described in the Icebreaking Levels of Service Document.
Icebreaker Type - The vessel type required to perform the icebreaking service.

Canadian Arctic Block Commitments

#	Area Name	Description of Area	Period dd/mm	Service	Icebreaker Type
A01	Hudson Bay	Hudson Bay and CASPR Zones 16 & 14	03/07 - 24/10	1,2,3,5,6	1200
A02	Foxe Basin	CASPR Zone 8 exc. Fury & Hecla Strait	20/08 - 15/09	1,2,3,5,6	1200
A03	Hudson Strait	CASPR Zone 15 inc Ungava Bay	03/07 - 24/10	1,2,3,5,6	1200
A04	East Baffin	CASPR Zones 10 & 9	14/08 - 18/09	1,2,3,5,6	1200
A05	Parry Channel East	CASPR Zone 13 & Wellington Channel to Penny Strait	10/08 - 15/10	1,2,3,5,6	1200
A06	Parry Channel West	CASPR Zone 2, Peel Sound, Franklin Strait, Byam Martin Channel north to Cameron Is. and all of M'Clure Strait	10/08 - 15/10	1,2,3,5,6	1300
A07	Pelly	CASPR Zone 5, Gulf of Boothia, Prince Regent Inlet, inc. Fury & Hecla Strait & Bellot Strait	12/08 - 13/10	1,2,3,5,6	1300
A08	Ellesmere	CASPR Zone 3, Jones Sound, the Lincoln Sea & approaches to Alert	24/08 - 05/09	1,2,3,5,6	1300
A09	Victoria	CASPR Zones 7 & 11	12/08 - 13/10	1,2,3,5,6	1200, 1100
A10	Beaufort	CASPR Zones 12 & 4 west to Canada/U.S. border	10/07 - 06/10	1,2,3,5,6	1200, 1100
A11	Barrow	Canada/U.S. border west to Icy Cape, Alaska	10/07 - 06/10	1,2,3,5,6	1300
A12	West Greenland	East Baffin Bay, Disko Is. to Arctic Circle at CASPR Zone 10 limits	05/07 - 15/08	1,2,3,5,6	1200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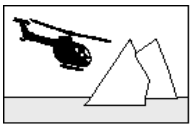
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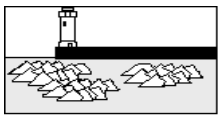
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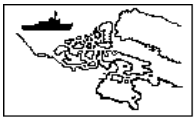
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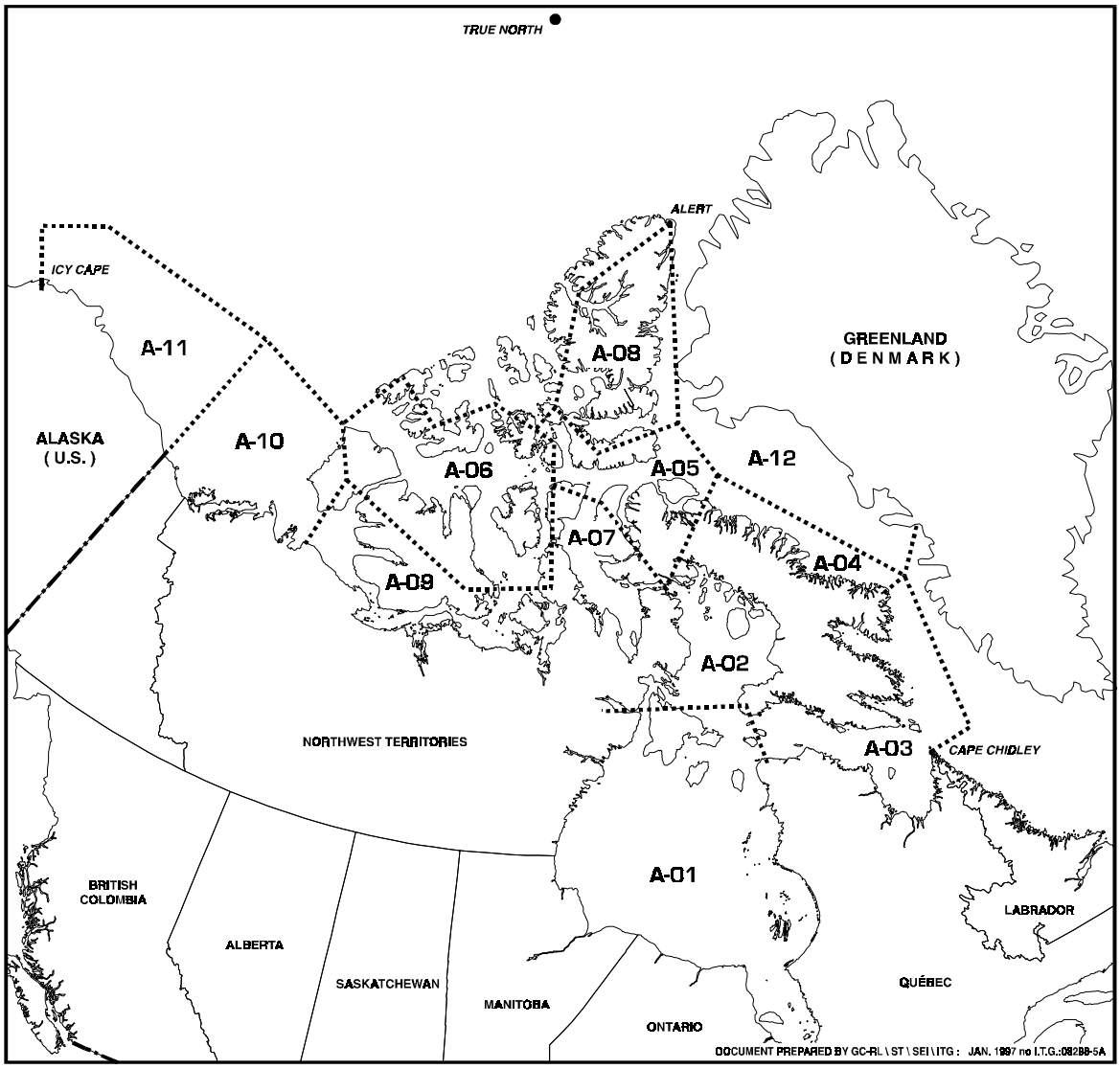
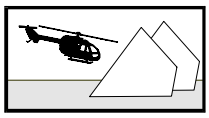
Fisheries and Oceans Canada / Pêches et Océans Canada
Coast Guard / Garde côtière

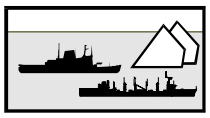
CANADIAN ARCTIC: ICE OPERATIONS SERVICE AREAS

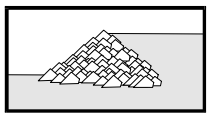
(BLOCK COMMITMENTS)

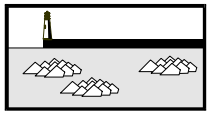


PRIMARY SERVICES:


ICE ROUTING AND INFORMATION SERVICES


ROUTE ASSISTANCE


FLOOD CONTROL

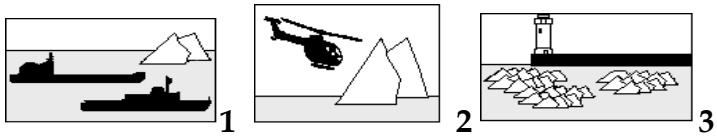

PORT MAINTENANCE


NORTHERN RESUPPLY SUPPORT


SUPPORT TO OTHER MINISTRY AND PUBLICS ORGANIZATIONS

Newfoundland Region Block Commitments

#	Area Name	Description of Area	Period dd/mm	Service	Vessel Type
N01	Northern Labrador	Cape Chidley to Cape Makkovik	15/10 - 15/12 15/05 - 15/07	1,2,3	1100
N02	Central Labrador	Cape Makkovik to Cape North	15/10 - 15/12 15/05 - 15/07	1,2,3	1100,1200
N03	Southern Labrador	Cape North to Forteau	15/12 - 07/01 15/05 - 15/07	1,2,3	1100
N04	NE Coast Newfoundland	Cape Bauld to Cape Freels	01/01 - 01/06	1,2,3	1100
N05	East Coast Newfoundland	Cape Freels to Cape St. Francis	15/02 - 15/05	1,2,3	1100,1200
N06	South Coast Newfoundland	Cape St. Francis to Cape St. Mary's	01/04 - 01/05	1,2,3	1100
N07	Placentia Bay	Cape St. Mary's to Lamaline	01/04 - 01/05	1,2,3	1100
N08	Southwest Coast Newfoundland	Lamaline to Havre Margaree	15/02 - 15/05	1,2,3	1100
N09	West Coast Newfoundland (south)	Fox Roost to South Head	15/02 - 15/05	1,2,3	1100,1200
N10	West Coast Newfoundland (north)	South Head to St. Barb's	15/02 - 15/05	1,2,3	1100
N11	Offshore Atlantic (northern portion)	Area north of 51°N between 60 & 200 miles offshore	15/02 - 15/05	1,2,3	1100,1200
N12	Offshore Atlantic (southern portion)	Area south of 51°N between 60 & 200 miles offshore	15/02 - 15/05	1,2,3	1100,1200



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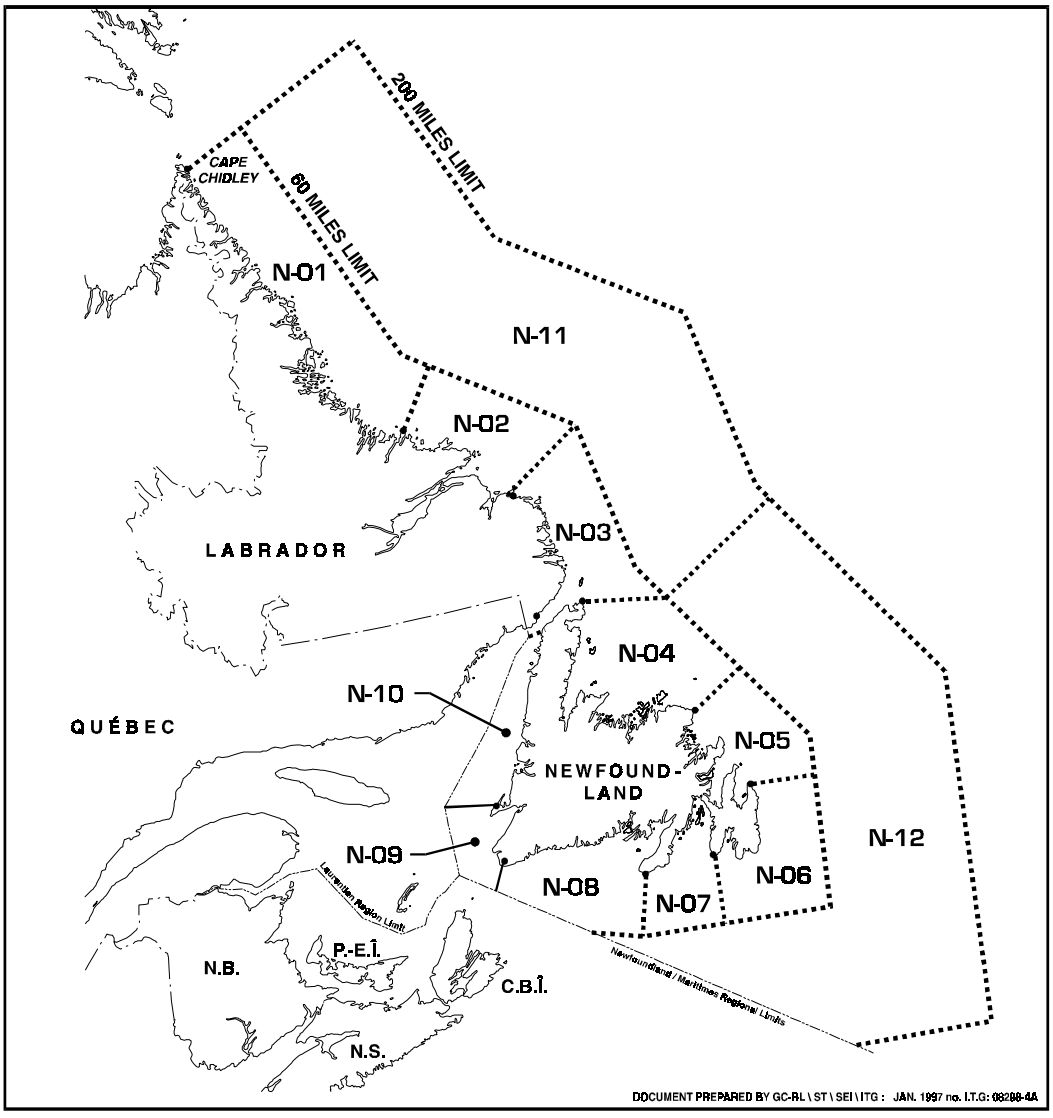
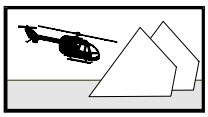
NEWFOUNDLAND REGION: ICE OPERATIONS SERVICE AREAS

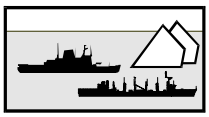
(BLOCK COMMITMENTS)



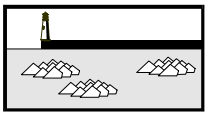
PRIMARY SERVICES:



ICE ROUTING AND INFORMATION SERVICES



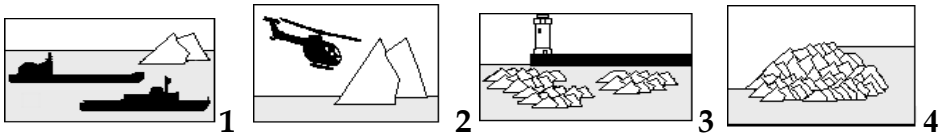
ROUTE ASSISTANCE



PORT MAINTENANCE

Maritimes Region Block Commitments

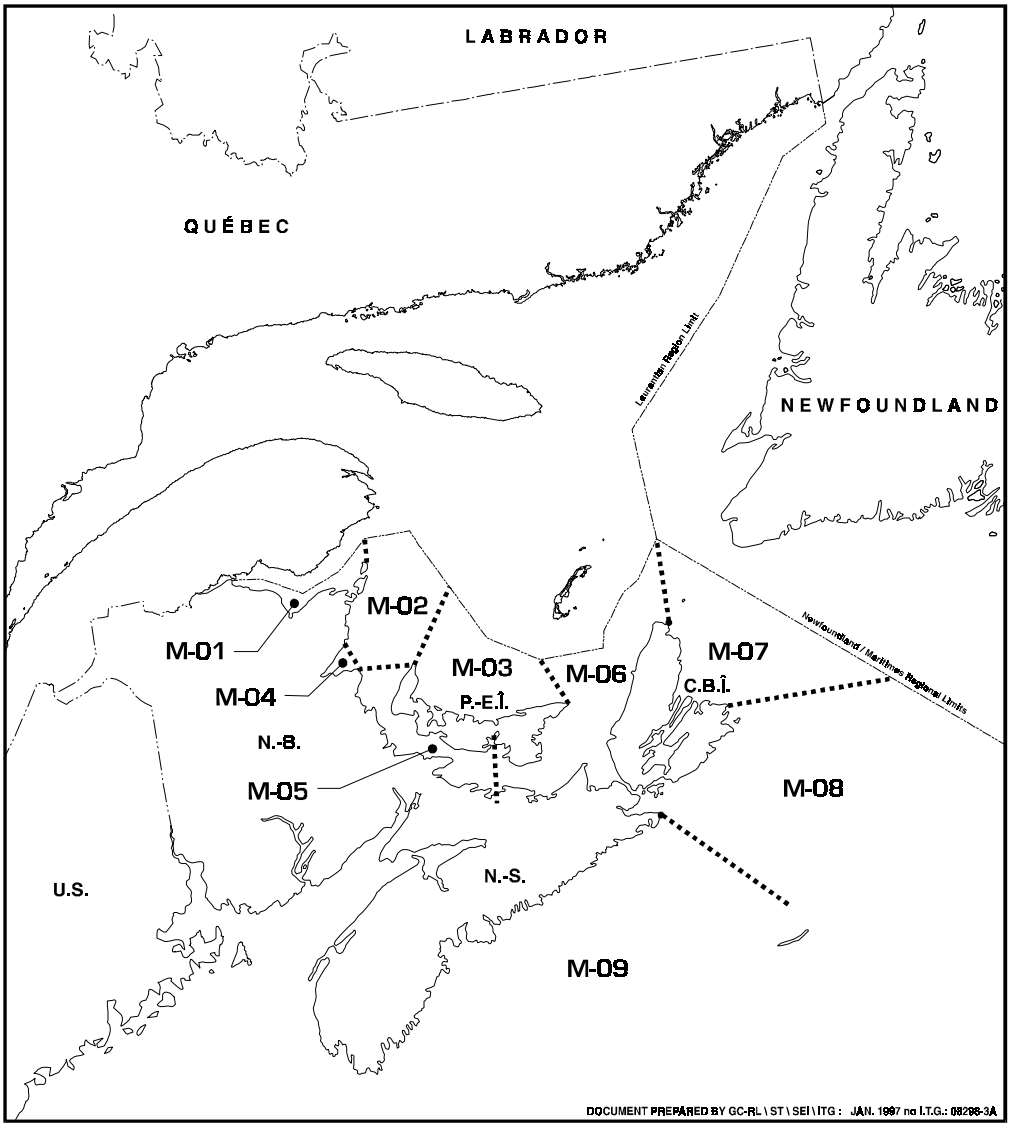
#	Area Name	Description of Area	Period dd/mm	Service	Vessel Type
M01	Chaleur Bay (south)	Dalhousie to Birch Pt . (southern portion)	21/12 - 15/04	1,2,3,4	1050,1100, 1200,1300
M02	Southwest Gulf	Birch Pt. to Pt. Escouminac to North Pt. to border	01/01 - 10/06	1,2,3	1050,1100, 1200,1300
M03	West Central Gulf	North Pt. to East Pt. and area north of P.E.I.	07/01 - 28/03	1,2	1050,1100, 1200,1300
M04	Miramichi	Miramichi River	01/01 - 07/04	1,2,3	1050,1100
M05	Northumberland Strait (west)	Northumberland Strait from Pt. Escouminac to Charlottetown	01/01 - 26/04	1,2,3	1050,1100, 1200,1300
M06	Northumberland Strait (east)	Northumberland Strait from Charlottetown to C. North	18/01 - 26/04	1,2,3	1050,1100, 1200,1300
M07	Sydney	Scatarie Is. to 46°N 58° 40'W to Cape North	28/01 - 29/04	1,2,3	1200,1300 1050,1100
M08	Cape Breton, South Coast	Cape Canso to 45°N 60°W to 46°N 58°40'W to Scatarie Is.	22/01 - 20/04	1,2,3	600,1100, 1000
M09	Southwest Coast Nova Scotia	West of C. Canso inc. Bay of Fundy	22/01 - 20/04	1,2,3	600,1000



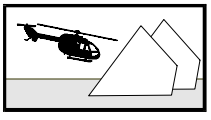
Fisheries and Oceans Canada / Pêches et Océans Canada
Coast Guard / Garde côtière

MARITIMES REGION: ICE OPERATIONS SERVICE AREAS

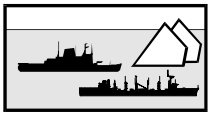
(BLOCK COMMITMENTS)



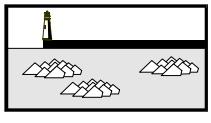
PRIMARY SERVICES:



ICE ROUTING AND INFORMATION SERVICES



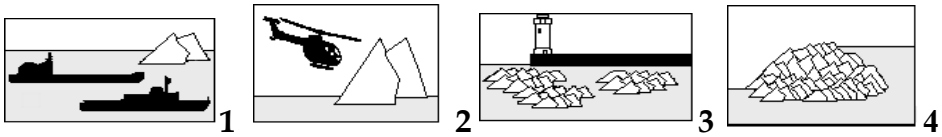
ROUTE ASSISTANCE



PORT MAINTENANCE

Gulf and River St. Lawrence Block Commitments

#	Area Name	Description of Area	Period dd/mm	Service	Icebreaker Type
L01	Lac St-Louis	St-Lambert to Beauharnois canal incl. south channel	15/12 - 31/12 20/03 - 02/04	1,2,3,4	ACV,1000, 1100,1200
L02	Trois-Rivières	Grondines to St-Lambert (Montreal)	15/12 - 31/03	1,2,3,4	ACV,1000, 1100,1200
L03	Québec	Ile Blanche to Grondines	15/12 - 31/03	1,2,3,4	1100,1200
L04	Saguenay	Bic to Ile Blanche including the Saguenay	21/12 - 31/03	1,2,3,4	1100,1200
L05	Sept-Îles	66°W to Bic	21/12 - 15/04	1,2,3	1100,1200
L06	Anticosti South	From 66°W to Pte à la Renommée to 47°38'N 60°35'W to 48°40'N 60°00'W to 49°52'N 64°31'W to 50°18'N 64°31'W to 48°40'N 60°00'W to 49°52'N 64°31'W to 50°18'N 64°31'W	01/01 - 15/04	1,2,3	1100,1200
L07	Anticosti North	From 50°18'N 64°13'W to 49°52'N 64°31'W to 48°40'N 60°00'W to 49°46'N 59°35'W to 50°18'N 64°13'W	01/01 - 15/04	1,2,3	1100,1200
L08	Lower North Shore	From 50°18'N 64°13'W to 49°46'N 59°35'W to 51°11.8'N 57°07.5'W to Québec/ Labrador border	01/01 - 15/04	1,2,3	1100,1200
L09	Iles-de-la-Madeleine	From 48°13'14"N 63°47'33"W along the regional boundary to 47°38'N 60°35'W to 48°15'N 62°17'W to 48°13'14"N 63°47'33"W	01/01 - 15/04	1,2,3	1100,1200
L10	Gaspé/Chaleurs	From the Restigouche River eastwards to 48°13'14"N 64°25'22"W to 48°15'N 62°17'W to 49°00'N 64°24'W	01/01 - 15/04	1,2,3 4	1100,1200 ACV
L11	Les Rivières	Lac St-Louis, R. Châteauguay, R. des Prairies, R. des Milles-Iles, R. L'Assomption, Lac St-Pierre, R. Maskinongé, R.-du-Loup, R. Yamaska, R. St-François, R. Nicolet, Pont de Trois-Rivières, R. de Bécancour, R. Batiscan	01/01 - 05/04	1,2,3,4	ACV



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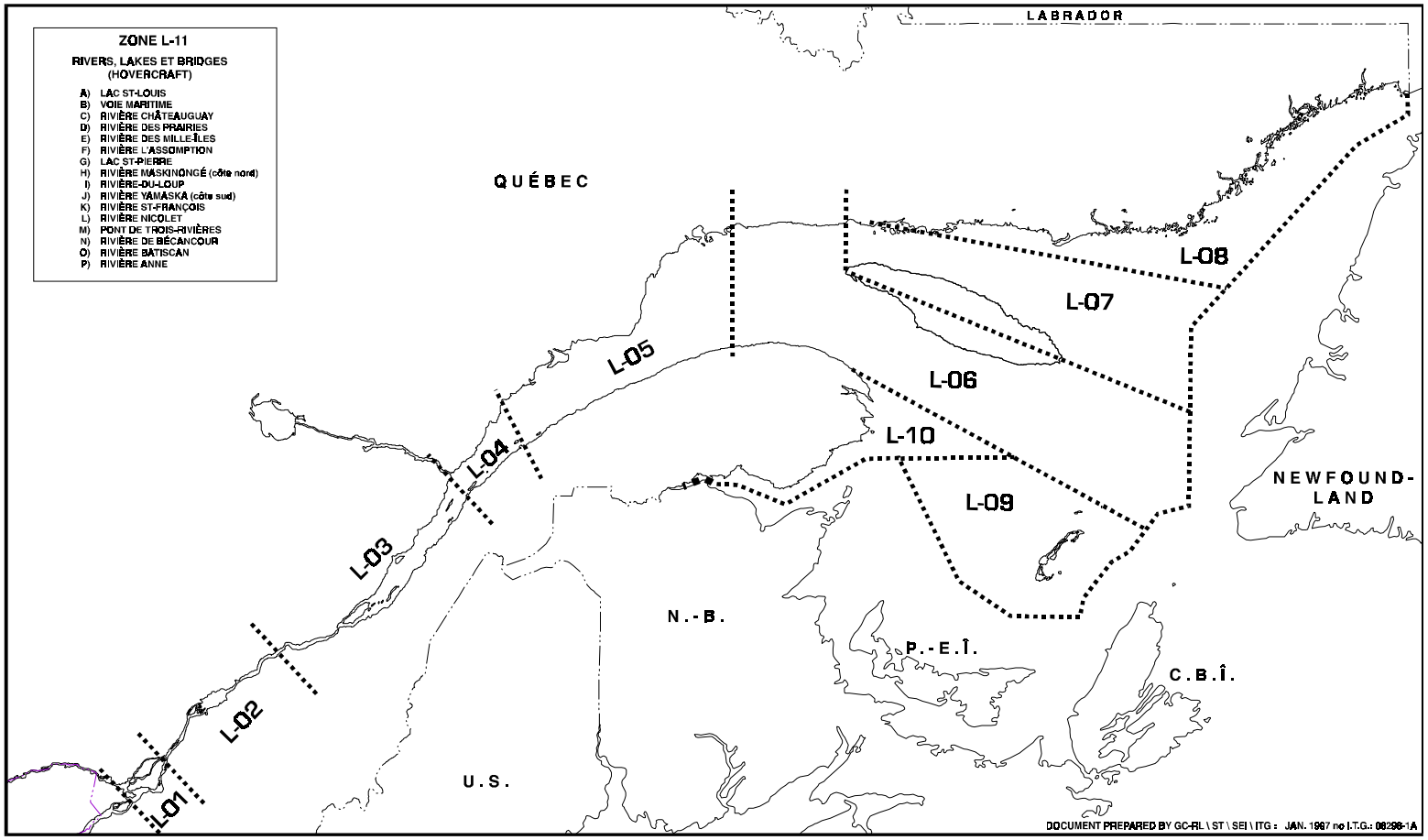
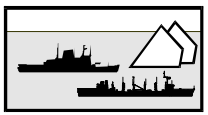
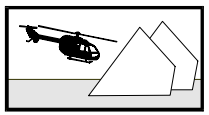
LAURENTIAN REGION: ICE OPERATIONS SERVICE AREAS

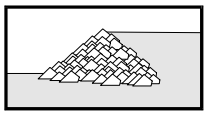
(BLOCK COMMITMENTS)

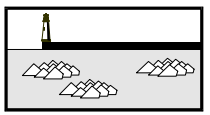


PRIMARY SERVICES:


ROUTE ASSISTANCE

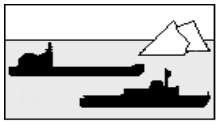

ICE ROUTING AND INFORMATION SERVICES


FLOOD CONTROL


PORT MAINTENANCE

Great Lakes Block Commitments

#	Area Name	Description of Area	Period dd/mm	Service	Vessel Type
C01	Lake Ontario to Beauharnois	Upper Beauharnois Lock to Bay of Quinte	20/03 - 10/04	1,2,3,4	1000
C02	Lake Erie East	Eastern Lake Erie - Port Colborne/Buffalo westward to Port Stanley	20/12 - 20/04	1,2,3,4	1100,1050
C03	Lake Erie West	Port Stanley to Sarnia, including Pelee Passage, Detroit River and St. Clair River	20/12 - 10/04 01/03 - 31/03	1,2,3,4	1100,1050
C04	Lake Huron	Goderich Hbr., Sarnia, Lake Huron	20/12 - 10/04	1,2,3,4	1100,1050
C05	Georgian Bay	Georgian Bay, North Channel of Lake Huron	20/12 - 10/04	1,2,3	1100,1050
C06	St. Mary's River	St. Mary's River, Detour Reefs to Gros Cap Lt.	21/03 - 10/04	1,2,3	1100,1050
C07	Lake Superior	All of Lake Superior excluding Thunder Bay and Duluth Harbours	21/03 - 20/04	1,2,3	1050
C08	Nipigon Bay	Nipigon Bay	21/03 - 10/04	1,2,3	1050
C09	Thunder Bay	Thunder Bay Harbour	20/12 - 15/01	1,2,3	1050
C10	Lake Superior West	Duluth Harbour	21/03 - 10/04	1,2,3	1050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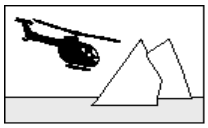
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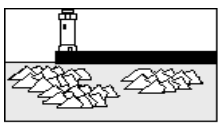
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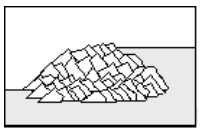
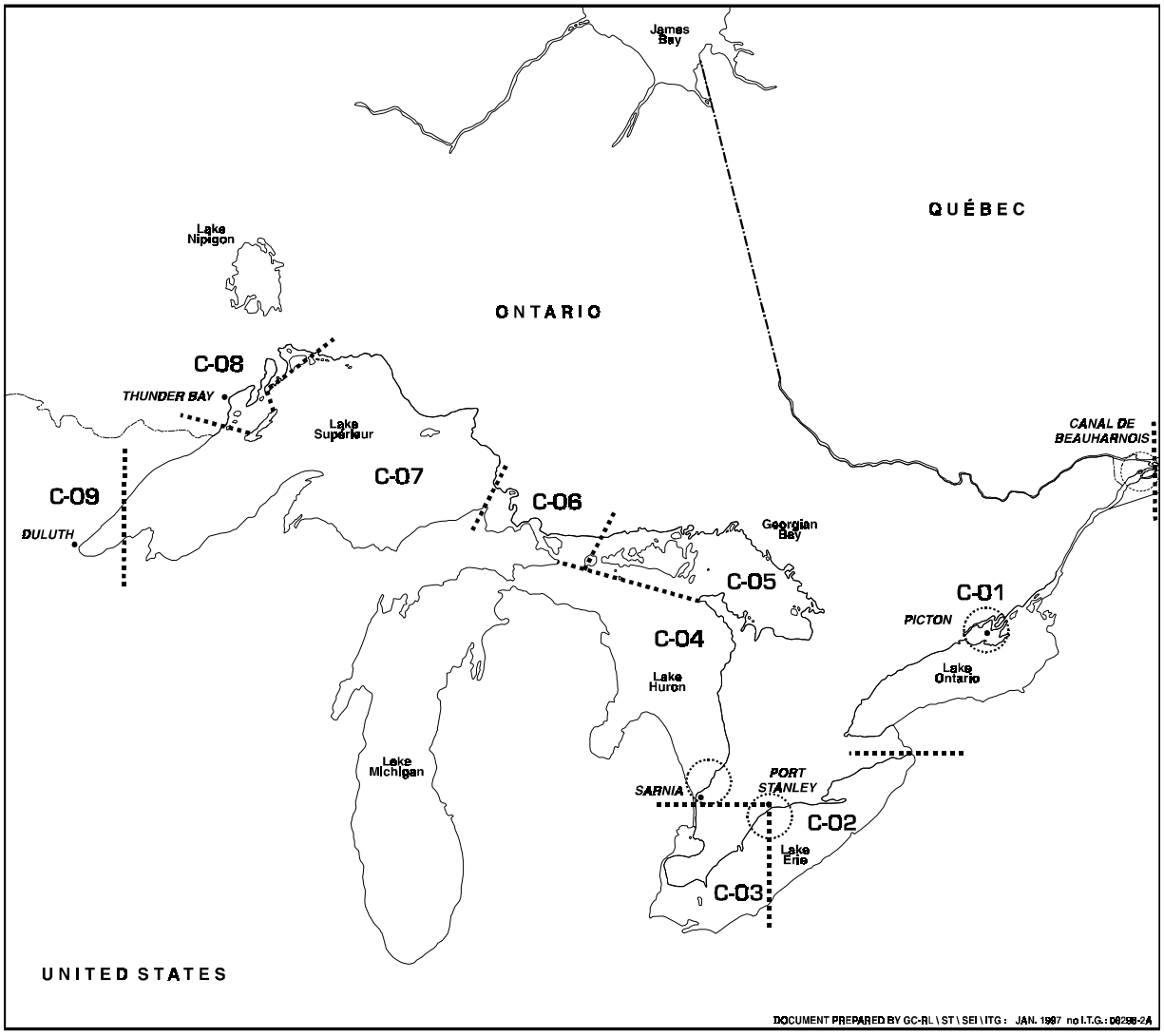

4

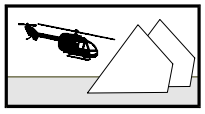
Fisheries and Oceans Canada / Pêches et Océans Canada
Coast Guard / Garde côtière

GREAT LAKES: ICE OPERATIONS SERVICE AREAS

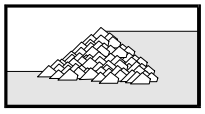
(BLOCK COMMITMENTS)



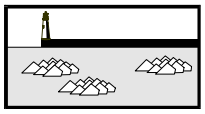
PRIMARY SERVICES:



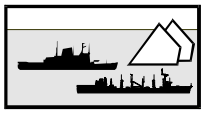
ICE ROUTING AND INFORMATION SERVICES



FLOOD CONTROL



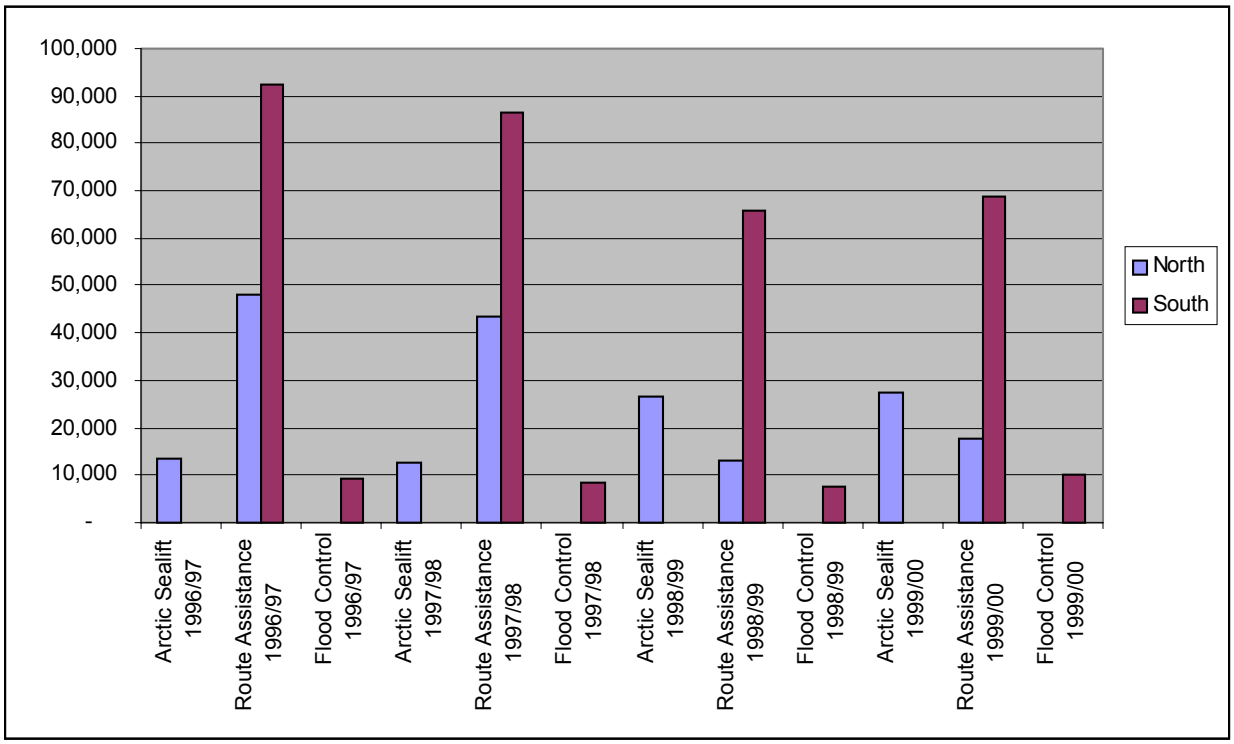
PORT MAINTENANCE



ROUTE ASSISTANCE

RESOURCE INFORMATION

FULL COSTS OF ICEBREAKING ($000)



CANADIAN COAST GUARD ICEBREAKERS

REGION	VESSEL TYPE	VESSEL NAME
Newfoundland	1200	HENRY LARSEN
	1100	ANN HARVEY
	1100	J.E. BERNIER
Maritimes	1300	LOUIS S. ST-LAURENT
	Icebreaker/Supply Tug	TERRY FOX
	1100	SIR WILLIAM ALEXANDER
	1100	EDWARD CORNWALLIS
	1050	EARL GREY
Quebec	1200	DES GROSEILLIERS
	1200	PIERRE RADISSON
	1200	SIR JOHN FRANKLIN
	1100	GEORGE R. PEARKES
	1100	MARTHA L. BLACK
	1000	TRACY
	ACV	WABAN-AKI
	ACV	SIPU-MUIN
Central & Arctic	1100	GRIFFON
	1050	SAMUEL RISLEY
	1000	SIMCOE
Pacific	1100	SIR WILFRID LAURIER

PLANNED ICEBREAKER DELOYMENT

There are 20 Canadian Coast Guard vessels available for support to the Icebreaking Program. The Joint Industry / Coast Guard Icebreaking Task Force, a sub-committee of the Marine Advisory Board established on December 5, 1995, determined the number of vessels required for a core icebreaker fleet, namely 5 heavy icebreakers, 12 light icebreakers and one air cushion vehicle, for winter and Arctic operations. There are sometimes conflicting demands for these vessels by other DFO programs during planned icebreaking operations, for Search and Rescue coverage, Marine Navigation Services, Ocean Science projects, and Conservation and Protection activities. There is also the possibility of temporary re-deployments to other regions to meet icebreaking program shortfalls, a zonal approach to meeting LOS standards. Therefore, the number of units utilized during the ice seasons may exceed 18, however, the number of shipdays will remain within planning figures.

The Chart 'Planned Icebreaker Deployment' does not include pre and post arctic operations required for the loading/unloading of the icebreakers. The pre-Arctic period averages 3 weeks, and the post-Arctic period averages two weeks.

PLANNED ICEBREAKER DEPLOYMENT

Ship Type	Reg	December				January				February				March					April				May				June				July				August				September				October				November				Number of Ship-days
		7	14	21	28	5	12	19	26	2	9	16	23	2	9	16	23	30	6	13	20	27	4	11	18	25	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	5	12	19	26	9	16	23	30	
1100	C & A			■	■	■	■	■								■	■	■	■	■																																68
1050	C & A			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																																121
1000	C & A																■	■																																		14
1000	Q			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																																		106
1100	Q			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																																		106
ACV	Q					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																																	104
ACV	Q					■	■	■	■	■	■	■	■	■	■	■	■	■																																			90
1200	Q			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■										■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					121 + 117
1200	Q			■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■												■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					121+109
1100	Q				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																																	114
1100	M					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																																	105
1100/1050	M				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																																	121
1200	M					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■											■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					105 + 108
1300	M							■	■	■	■	■	■	■	■	■	■	■	■	■															■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				86 + 80
1100	N					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																												■			121 + 7
1200	N							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■									■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					121 + 102
1100	N																		■	■	■	■																													30
1100	P																														■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					109

VESSEL/AIRCRAFT DESCRIPTION

TYPE 1300 HEAVY GULF ICEBREAKER

"Large vessel escort in most severe Atlantic and Gulf Operations, extended season operations through ice zone 6 or areas of less severity."

Quantity: 1	Range: 23,000 n.m.
Power: 29,400 kW	GRT: 10,908 t
Max. Speed: 18.3 Kts	Length: 119.63 m
Draft: 9.91 m	Fuel Capacity: 3,600 t

Capable of maintaining a speed of advance of 3 Knots through uniform first year ice 1,400 mm (4.5 ft.) thick.

HEAVY ICEBREAKER/SUPPLY TUG

"Large vessel escort in all areas of Southern Canada, summer Arctic Operations."

Quantity: 1	Range:
Power: 23,200 kW	GRT: 4,234 t
Max. Speed: 15.43 Kts	Length: 88 m
Draft: 8.3 m	Fuel Capacity: 1919 t

Ice Class: Arctic Class 4

TYPE 1200 MEDIUM GULF/RIVER ICEBREAKER

"Large vessel escort in all areas of Southern Canada, summer Arctic Operations."

Quantity: 4	Range: 15,000 n.m.
Power: 10,000 - 12,000 kW	GRT: 5,910 - 6,172 t
Max. Speed: 16.5 Kts	Length: 98 - 100 m
Draft: 7 m	Fuel Capacity: 1,584 - 2,215 t

Capable of maintaining a speed of advance of 3 Kts through uniform first year ice 900 mm (3.0 ft.)

TYPE 1100 MAJOR NAVAIDS TENDER/LIGHT ICEBREAKER

"Buoy handling and heavy cargo; small to large vessel escort in all areas of Southern Canada and Sub-Arctic."

Quantity: 8	Range: 5,500 - 6,500 n.m.
Power: 5,000 - 6,000 kW	GRT: 2,200 - 3,800 t
Max. Speed: 15.5 Kts	Length: 70 - 80 m
Draft: 4 - 6 m	Fuel Capacity: 323 - 783.7 t

Capable of maintaining a speed of advance of 3 Kts through uniform first year ice 600 mm (2.0 ft.)

TYPE 1050 MEDIUM NAVAIDS TENDER/LIGHT ICEBREAKER

"Buoy handling, restricted mainly to deck cargo; small and medium vessel escort in more restricted waters."

Quantity: 2	Range: 12,000 - 18,000 n.m.
Power: 6,360 - 6,500 kW	GRT: 1,988 t
Max. Speed: 13 Kts	Length: 69.73 m
Draft: 5.2 m	Fuel Capacity: 640 t

Capable of maintaining a speed of advance of 3 Kts through uniform first year ice 600 mm (2.0 ft.)

TYPE 1000 MEDIUM NAVAIDS TENDER

"Buoy handling and medium capacity cargo; small and medium vessel escort in more restricted and shallow waters."

Quantity: 2	Range: 3,300 - 10,000 n.m.
Power: 1,490 - 2,900 kW	GRT: 960 - 2,064 t
Max. Speed: 11 - 13 Kts	Length: 50 - 65 m
Draft: 3.66 - 4.6 m	Fuel Capacity: 180 t

Capable of maintaining a speed of advance of 3 Kts through uniform first year ice 300 mm (1.0 ft.)

AIR CUSHION VEHICLES

AP 1-88/200: "Icebreaking for flood control and seaway operation; small navaids tender."

Quantity: 2	Range: 350 n.m.
Power: 1,760 kW	Max. gross weight: 47.6 t
Max. Speed: 50 Kts	Length: 24.5 m
Breadth: 11.2 m	Fuel Capacity: 4.8 t

Ice: Capable of breaking 1.52 m. (4.5 ft.) of relatively flat river ice. Not used for escort operations.

ROTARY WING AIRCRAFT:

BELL 212 Quantity: 5

Length: 17.45 m	Max. fuel: 1,179 kg
Rotor dia.: 14.64 m	Power: 962 kW
Max. take-off weight: 5,081 kg	Endurance: 3.3 hr.
Empty weight: 3,130 kg	Cruise speed: 100 Kts
Disposable load (full fuel and pilots): 750 kg	

BELL 206L Quantity: 7

Length: 12.93 m	Max. fuel: 300 kg
Rotor dia.: 11.28 m	Power: 313 kW
Max. take-off weight: 1,814 kg	Endurance: 2.8 hr.
Empty weight: 1,075 kg	Cruise speed: 110 Kts
Disposable load (full fuel and pilots): 250 kg	

MBB BO 105 Quantity: 16

Length: 11.86 m	Max. fuel: 464 kg/624 kg (aux. tank)
Rotor dia.: 9.84 m	Power: 626 kW
Max. take-off weight: 2,500 kg	Endurance: 2.5 hr.
Empty weight:	Cruise speed: 115 Kts
Disposable load (full fuel and pilots): 360 kg	

FIXED WING AIRCRAFT:

DeHAVILLAND DHC-8 Quantity: 1

Length: 22.25 m	Max. fuel: 40,792 kg
Wing span: 25.6 m	Power: 2 x 1,342 kW
Max. take-off weight: 15,648.93 kg	Empty weight: 11,022.29 kg
Endurance: 10.0 hr.	Disposable load 136.08 kg
Cruise speed: 180 Kts	

FLOOD CONTROL / ICE MANAGEMENT

Special conditions exist in the St. Lawrence River between Quebec and Montreal where broken ice brought down by the current is apt to consolidate, forming extensive jams which cause a rapid rise in the water level to dangerous heights. In order to prevent the development of this situation, CCG icebreakers operate in the river throughout the winter to keep a channel open for the unobstructed movement of broken ice downstream, while ensuring the maintenance of shore fast ice.

There are various methods of alleviating flooding problems caused by ice jams on the upper St. Lawrence River and other Canadian waterways:

a) To encourage the formation of an ice cover outside the channel:

   The deployment of ice retention booms - Two types of ice booms are used by the Canadian Coast Guard; traditional wooden ice booms and steel ice booms. Each section of the steel ice booms have instrumentation to measure the force of ice against the boom.

   Manmade islands are located off the north and south coast of Lac St. Pierre to increase the stability of ice coverage on the lake outside the channel.

   CCG regulates the speed of commercial vessels when necessary to prevent breakage of the ice cover by the wake of passing vessels.

b. To encourage the evacuation of ice within the shipping channel from Lac St. Pierre:

   The CCG will aim for improved management of water levels in the Great Lakes/St. Lawrence System. This will ensure control of water flow and current to respond to ice conditions on the river, thus increasing the rate of ice evacuation.

   As a result of research undertaken, Laurentian Region has developed new methods of operations and new techniques for icebreaking in this area.

c. Icebreaking Operations

   To help improve flood control operations management, CCG, in partnership with Environment Canada, has installed a sophisticated data gathering network on Lac. St. Pierre to precisely monitor and measure water levels, velocity of the current, water flows, water and air temperature and direction, as well as wind speed and direction. Video cameras and dynamometers are used to monitor and measure ice conditions at Lanoraie, Lavaltrie and Lac St. Pierre. This real-time information is analyzed by a hydraulic specialist and is available to the Ice Operations Centre in Québec to ensure improved coordination and tasking of icebreakers.

CANADIAN ICE SERVICE, ENVIRONMENT CANADA

The Canadian Coast Guard has a contractual agreement with the Canadian Ice Services (CIS) Branch, Meteorological Services of Canada (MSC), of Environment Canada, to provide strategic and tactical ice information.

Ice Conditions Observations and Analysis

Ice observations are acquired from a mix of the following sources:

- satellite-based visual (NOAA, RADARSAT),
- infrared (NOAA) and passive microwave imagery (SSM/I),
- fixed wing airborne human observations,
- CCG helicopter-borne human observations,
- fixed wing airborne remote sensing (radar imagery, passive microwave imagery, infrared and visual imagery, laser profiles),
- CCG ship borne human observations, and
- other surface based observations and measurements.

CIS Ice Service Specialists (ISS) are assigned to CCG icebreakers, CCG Ice Operations Centres as well as on board Ice Patrol aircraft. During periods when the ships or the aircraft operate in or near ice infested waters, these specialists observe and record the ice conditions (occasionally by in situ sampling measurements on the ice).

The data is analyzed using various techniques for inclusion into the products that CIS provides to Coast Guard and other Users. Analysis is done at ICEC (Ice Centre, Environment Canada) using the Ice Data Integration and Analysis System (IDIAS). ISS personnel on ships and in the Ice Offices also analyze data as required for local areas.

Ice Conditions Forecasts

Information bulletins, including descriptions of current (near-term forecast) ice conditions and forecasts of future ice conditions, are produced by the CIS for ice-infested waters during the appropriate navigational seasons. The forecast periods range from 24 hours to a full seasonal outlook (4-5 months).

Typically, the ice information provided to CCG includes the following items:

- freeze-up and break-up forecasts
- ice types and/or stages of development
- ice concentration and its distribution by type and floe size
- direction of ice drift and an indication of pressure development
- presence of ice of land origin (e.g. icebergs)

Ice Charts

Some ice information is presented in chart format and distributed by facsimile, (phone, satellite or radio) or mail:

a) Observed Ice Conditions (1:1 000 000 scale) is used to give detailed real time descriptions of the ice as observed.

b) Ice Analysis Charts (1:2 000 000 scale) uses data from the sources mentioned above to give a pictorial representation of the ice conditions at a moment of time.

c) Composite Ice Conditions (1:4 000 000 scale) these are sent out once or twice a week by mail to subscribers. These show a broader area of coverage than a or b.

d) Forecast chart of selected areas (1:2 000 000 scale) experimental basis.

Telecommunications

Observations, imagery and analyses of ice conditions are transmitted in digital or analogue format between the field, ICEC, and users, including CCG Ice Offices, Traffic Centres, and CCG icebreakers, by the following modes of communication:

- facsimile,
- code or plain language means using:
- public telephone,
- electronic mail,
- broadband systems,
- INMARSAT,
- CIS telecommunications systems
- HF, VHF radio
- TELEX

The CIS ice reconnaissance aircraft transmits data in flight. A computer based receiving, recording and display system allows raw SAR (Synthetic Aperture Radar) and SLAR (Side Looking Airborne Radar) imagery to be viewed on specially equipped vessels and Ice Offices. The IRDNET telecommunications system relays this data in real time from the aircraft to ICEC and Ice Offices.

HF-Radio, Facsimile and CIS telecommunications systems are the primary means of broadcasting ice information. Canadian Coast Guard Radio Stations (CGRS) stations provide such information to interested vessels as outlined in TP146 Radio Aids to Marine Navigation (RAMN).

Ice Climatology

For planning and research and development purposes, CCG requires climatological information on ice conditions. CIS develops and maintains historical tabular and/or analyzed (Ice Atlas) ice conditions information for relevant Canadian waters. Increasingly, this information will be kept in user-accessible computer files.

CIS also maintains a data base on the heat content of the water and currents, along with forecast weather and oceanic conditions to provide useful forecasts of ice freeze-up, development, decay and break-up in areas of interest for the ice navigation season.

REQUESTS FOR ICEBREAKING SERVICES

The CCG Ice Operations Centres are in operation seasonally as ice conditions dictate within their area of responsibility. During the ice season, they are in operation 24 hours a day and are staffed with professional Ships Officers who have experience in the operation of icebreakers and ships in ice. The Ice Operations Centres are in contact with icebreakers at all times and maintain contact with shipping via CCG Marine Communications and Traffic Service Centres.

Requests for icebreaking services should be forwarded to the following Ice Operations Centres or CCG offices.

Winter Operations:

Ice Operations Centre
Newfoundland Region:
P.O. Box 1300
St. John's, Newfoundland A1C 6H8
Telephone: (709) 772-5119 or (709) 772-2078
Fax: (709) 772-5369

Ice Operations Centre
Laurentian Region:
101 Blvd Champlain
Québec, Québec
Téléphone: (418) 648-2214 or (418) 648-7290
Fax: (418) 648-7305

Ice Operations Centre
Maritimes Region:
P.O. Box 1000
Dartmouth, Nova Scotia
Telephone: (902) 426-5664 or (902) 426-5665
Fax: (902) 426-6444

Ice Operations Centre
Central & Arctic Region:
105 Christina Street South
Sarnia, Ontario N7T 7W1
Telephone: (519) 383-1918
Fax: (519) 337-2498

Arctic Operations:

Marine Communications & Traffic Services
Centre Iqaluit:
P.O. Box 189
Iqaluit, Nunavut X04 0H0
Telephone: (867) 979-5200
Fax: (867) 979-2618

Central & Arctic Region:
201 N. Front St., Suite 703
Sarnia, Ontario N7T 8B1
Telephone: (613) 383-1918
Fax: (613) 383-2498

COMPLAINTS, COMMENTS OR SUGGESTIONS

CCG is committed to providing you with the best service possible. In order to ensure that your needs are being addressed, your comments, complaints or suggestions are encouraged. Please contact the appropriate offices listed above or comment in writing to the Manager, Icebreaking Program, Canadian Coast Guard, 200 Kent St, Ottawa, Ontario K1A 0E6
Fax: (613) 990-5541 or 1-800-920-7767