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Homeland Security

**United States
Coast Guard**

Waterways Management: Domestic Ice Management Tactics, Techniques, and Procedures (TTP)

**Force Readiness Command
(FORCECOM)**

**CGTTP 3-71.17
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United States Coast Guard

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COAST GUARD TACTICS, TECHNIQUES, AND PROCEDURES 3-71.17

Subj: WATERWAYS MANAGEMENT: DOMESTIC ICE MANAGEMENT

Ref:
(a) Use of Vessels for Ice-breaking Operations in Channels and Harbors, Executive Order 7521
(b) Primary Duties, 14 U.S.C. § 2
(c) Purpose, 49 U.S.C. § 101
(d) Ports and Waterways Safety—General, 33 CFR Part 160
(e) Vessel Traffic Management, 33 CFR Part 161
(f) Regulated Navigation Areas and Limited Access Areas, 33 CFR Part 165
(g) Waterways Management (WWM): Limited Access Areas and Other Access Control Measures Tactics, Techniques, and Procedures (TTP), CGTTP 3-71.1 (series)
(h) Domestic Icebreaking Operations Policy, COMDTINST 16151.1 (series)
(i) Domestic Icebreaking Tactics, Techniques, and Procedures (TTP), CGTTP 3-91.9 (series)
(j) Marine Safety Manual, Volume I, Administration and Management, COMDTINST M16000.6 (series)
(k) Marine Transportation System Recovery Planning and Operations, COMDTINST 16000.28 (series)
(l) Telecommunication Manual, COMDTINST M2000.3 (series)
(m) Telecommunication Tactics, Techniques, and Procedures (TTP), CGTTP 6-01.2 (series)
(n) External Affairs Tactics, Techniques, and Procedures (TTP), CGTTP 1-04.1 (series)
(o) Waterways Management (WWM): Hazards to Navigation Tactics, Techniques, and Procedures (TTP), CGTTP 3-71.5 (series)
(p) Navigable waters of the United States, navigable waters, and territorial waters, 33 CFR 2.36

1. PURPOSE. To provide sectors and marine safety units (MSU) with Coast Guard tactics, techniques, and procedures (CGTTP) on how to safely, effectively, and efficiently manage domestic ice breaking within their captain of the port zone.

2. ACTION. This CGTTP publication applies primarily to sector and MSU waterways management staff but can be leveraged by anyone responsible for managing domestic ice breaking. Internet release is authorized.

3. DIRECTIVES/TTP AFFECTED. None.

4. DISCUSSION. Successful management of domestic ice breaking is vital to facilitating commerce and maintaining a safe and vibrant marine transportation system in the United States. District commanders, Sector commanders and commanding officers of MSUs are responsible for coordinating with international, federal, state, and local agencies, industry, and the public to ensure navigable waterways critical to commerce remain open and safe for navigation. This CGTTP publication provides novice users with foundational and practical knowledge necessary to understand and manage domestic ice breaking. It also provides experienced personnel with a means of referencing current best practices and standardizes common domestic ice management principles across the Coast Guard.

5. DISTRIBUTION. FORCECOM TTP Division posts an electronic version of this TTP publication to the CGTTP Library on CGPortal. In CGPortal, navigate to the CGTTP Library by selecting **References > TACTICS, TECHNIQUES, AND PROCEDURES LIBRARY**. FORCECOM TTP Division does not provide paper distribution of this publication.

6. REQUEST FOR CHANGES. Submit recommendations for TTP improvements or corrections through the TTP Request form on CGPortal. In CGPortal, navigate to the TTP Request form by selecting **References** > **FORCECOM - TTP Requests**.

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Chapter 1: Introduction

Introduction

This chapter overviews the contents of this tactics, techniques, and procedures (TTP) publication. It also defines the use of notes, cautions, and warnings in TTP publications.

In This Chapter

This chapter contains the following sections:

Section	Title	Page
A	Introduction	1-2
B	Notes, Cautions, and Warnings	1-3

Section A: Introduction

A.1. Introduction

The purpose of this TTP publication is to assist waterways managers with effectively and efficiently managing domestic icebreaking (DOMICE) operations.

The United States Coast Guard (USCG) conducts icebreaking operations in U.S. territorial waters and, by agreement, in Canadian waters on the Great Lakes to respond to situations in this priority:

1. Search and rescue (SAR), and ports, waterways, and coastal security (PWCS) missions.
2. Urgent vessel requests (i.e., vessels beset in the ice or subject to navigational hazards).
3. Exigent community service requests (i.e., open channels to icebound communities that have a need for fuel, food, and medical supplies, or aid in preventing floods and hazardous water stages caused by ice jams).
4. Provide for safety of navigation subject to the reasonable demands of commerce.

A.2. The Ice Season

The icebreaking season is an annual event that historically occurs between December and April. Specific dates of the ice season vary regionally and from year to year.

A.3. TTP Deviations

This TTP publication cannot cover every icebreaking management scenario that might arise. Certain cases might result in a need to deviate from guidance in this publication. Deviate from this TTP publication as necessary to complete tasks with greater safety, effectiveness, or efficiency. Do not take such deviations lightly. Temper any decision to deviate with good judgment and a complete understanding of the mission, policy, members' capabilities, and equipment. Whenever possible, consult your unit chain of command prior to deviation. Report TTP adjustment needs per the Request for Changes paragraph in the letter of promulgation.

Section B: Notes, Cautions, and Warnings

B.1. Overview

The following definitions apply to notes, cautions, and warnings found in TTP publications.

NOTE: **An emphasized statement, procedure, or technique.**

CAUTION: **A procedure, technique, or action that, if not followed, results in risk to the safety or security of the port, waterways users, marine environment, or the facilitation of commerce.**

WARNING: ***A procedure, technique, or action that, if not followed, carries significant risk to the safety or security of ports, waterways users, the marine environment, or facilitation of commerce. It could also risk damage to potential or actual prosecutions, defenses, or other litigation involving the USCG.***

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Chapter 2: Fundamental Principles

Introduction

This chapter discusses captain of the port (COTP) and district commander authorities and jurisdictions as they relate to the DOMICE mission.

In This Chapter

This chapter contains the following sections:

Section	Title	Page
A	Authorities Relevant to DOMICE Management	2-2
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Section A: Authorities Relevant to DOMICE Management

A.1. Executive Order 7521, Use of Vessels for Ice-breaking Operations in Channels and Harbors

Reference (a), Use of Vessels for Ice-breaking Operations in Channels and Harbors, Executive Order 7521, issued by President Franklin D. Roosevelt in 1936, is the core directive that provides overarching authority for the USCG's icebreaking mission:

"1. The Coast Guard, operating under the direction of the Secretary of the Treasury, is hereby directed to assist in keeping open to navigation by means of ice-breaking operations, in so far as practicable and as the exigencies may require, channels and harbors in accordance with the reasonable demands of commerce; and to use for that purpose such vessels subject to its control and jurisdiction or which may be made available to it under paragraph 2 hereof as are necessary and are reasonably suitable for such operations.

"2. The Secretary of War (Army), the Secretary of the Navy, and the Secretary of Commerce are hereby directed to cooperate with the Coast Guard in such icebreaking operations, and to furnish the Coast Guard, upon the request of the Commandant thereof, for this service such vessels under their jurisdiction and control as in the opinion of the Commandant, with the concurrence of the head of the Department concerned, are available and are, or may readily be made, suitable for this service."

A.2. Primary Duties, 14 U.S.C. § 2

Reference (b), Primary Duties, 14 U.S.C. § 2, provides further authority for the USCG to establish, maintain, and carry out its icebreaking capabilities, which states:

"The Coast Guard shall — … (4) develop, establish, maintain, and operate, with due regard to the requirements of national defense, aids to maritime navigation, icebreaking facilities, and rescue facilities for the promotion of safety on, under, and over the high seas and waters subject to the jurisdiction of the United States;

"(5) pursuant to international agreements, develop, establish, maintain, and operate icebreaking facilities on, under, and over waters other than the high seas and waters subject to the jurisdiction of the United States;"

A.3. Purpose 49 U.S.C. § 101

Reference (c), Purpose, 49 U.S.C. § 101, requires development of transportation policies and programs that contribute to providing fast, safe, efficient, and convenient transportation. This includes icebreaking as a means of facilitating commerce by making waterways more navigable.

A.4. Ports and Waterways Safety—General, 33 CFR Part 160

Reference (d), Ports and Waterways Safety—General, 33 CFR Part 160, describes the authority exercised by district commanders and COTPs to ensure:

- The safety of vessels and waterfront facilities.
- The protection of the navigable waters and the resources therein.

A.5. Vessel Traffic Management, 33 CFR Part 161

Reference (e), Vessel Traffic Management, 33 CFR Part 161, provides the USCG authority to use Vessel Traffic Services (VTS) to facilitate safe navigation of vessels through waterways impacted by icing conditions:

"The purpose of this part is to promulgate regulations implementing and enforcing certain sections of the Ports and Waterways Safety Act (PWSA) setting up a national system of Vessel Traffic Services that will enhance navigation, vessel safety, and marine environmental protection, and promote safe vessel movement by reducing the potential for collisions, rammings, and groundings, and the loss of lives and property associated with these incidents within VTS areas established hereunder."

A.6. Regulated Navigation Areas and Limited Access Areas, 33 CFR Part 165

Reference (f), Regulated Navigation Areas and Limited Access Areas, 33 CFR Part 165 provides the USCG with authority to establish and maintain limited access areas. This includes regulated navigation areas, and safety and security zones to maintain adequate maritime safety and security on waterways affected by icing conditions. See reference (g), Waterways Management (WWM): Limited Access Areas and Other Access Control Measures Tactics, Techniques, and Procedures (TTP), CGTTP 3-71.1, for detailed guidance on creating new limited access areas.

Section B: Roles and Relationships

B.1. District Commander

Per reference (h), Domestic Icebreaking Operations Policy, COMDTINST 16151.1 (series), district commanders establish, maintain, and execute commercial icebreaking assistance plans for their areas of responsibility (AORs). This includes:

- Promulgate whether an operations order (OPORD), incident action plan (IAP), or standard operating procedure (SOP) provides details of icebreaking services to be provided in specific waterways.
- Provide area specific DOMICE management guidance for each COTP zone, including icebreaking priorities and commercial assistance.
- Work with harbor safety committees (HSCs) and local stakeholders to establish and document, in a publicly available plan or notice, waterways priorities for facilitation of navigation per the tiered waterways system.
- Liaise with appropriate authorities to evaluate DOMICE requests.
- Incorporate effective risk management procedures.
- Forward requests for significant expansion of icebreaking services via the chain of command to Commandant (CG-WWM-3) for consideration. Significant expansion of icebreaking services is defined as services beyond a district's normal level of resources.
- Assign district icebreakers to sectors.
- Coordinate icebreaking through sectors when the situation requires.
- Coordinate country clearance requests for cutters operating in Canadian ports.
- Request icebreaking resources from and provide icebreaking resources to the Canadian Coast Guard (CCG), as circumstances dictate. Exchange resources per the current agreement between the U.S. and Canada concerning coordination of icebreaking operations in the Great Lakes and St. Lawrence Seaway System (D9 only).
- Coordinate with the United States Army Corps of Engineers (USACE) to support later lock closing or early lock opening due to
  - Regional economic crisis.
  - Emergency navigational problem.
  - SAR operations.
  - Other emergency circumstance.

B.2. District (dpw) Waterways Management

District waterways managers manage the icebreaking assistance plan, coordinate efforts across sectors, and ensure compliance with additional guidance set forth by the district commander. Tasks include:

- Directing district icebreaking resources as necessary.
- Providing tasking to assigned units by date and area or division.
- Forecast tasking to allow units to plan logistics and maintenance.
- Collect and disseminate vessel movement and ice condition information.
- Request additional resources from Atlantic and Pacific areas as needed.
- Conduct outreach with industry, communities, government agencies, CCG, other sectors, district, units, and others as needed. Appendix B: Example Outreach Letter is one form of outreach.
- Monitor use of commercial icebreaking resources. Continuously evaluate their availability as conditions and requests for assistance require.
- Coordinate vessel management with the COTP.
- Collect and report information on program measures.
- Submit reports per Enclosure (1) of reference (h), Domestic Icebreaking Operations Policy, COMDTINST 16151.1 (series).

B.3. Sector Commander

Sector commanders execute the DOMICE mission for their AOR. In doing so, they carry out district icebreaking instructional direction and commercial assistance guidance, including a plan to conduct outreach and invite participation from stakeholders.

B.3.a. Tactical Commanders

Tactical commanders are sector commanders with authority and responsibility over additional forces and areas necessary to accomplish the icebreaking mission. Districts can designate tactical commanders in OPORDs for icebreaking activities involving multiple COTP zones.

Supporting sectors keep the tactical commander apprised of ice conditions and ice effects on vessel movements and render support where needed. While rendering support, remain cognizant of varying factors, such as:

- Flow of commerce.
- Underpowered vessels.
- Environmental protection.
- Overall efficiency of icebreaking operations.

B.4. Sector Waterways Management

Sector WWM assists the sector commander in tactical execution of the icebreaking assistance plan. Sector WWM possesses local knowledge needed to make effective decisions and provide sound recommendations. Sector WWM also has experts on:

- Vessel patterns and shipping routes.
- Relevant nautical charts.
- Current regulations.
- Jurisdictions.
- Memorandum of agreement (MOA)/Memorandum of understanding (MOU) and treaties.
- Tiered waterways.
- Automatic Identification System (AIS).
- Communications:
  - Drafting correspondence.
  - Dispatching resources.
  - Reporting statistical data.

B.5. Command Center

Command centers (district and sector) play a vital role in maintaining situational and maritime domain awareness, monitoring shore, surface, and air operations, and processing icebreaking requests from the public.

Each sector determines the appropriate organization and employment of forces to carry out DOMICE activities per district and commandant policies.

B.6. Cutter Manager

Cutter managers (district and sector) coordinate employment of assigned cutters as directed by sector commanders. Cutter managers also coordinate the following capabilities and reports with assigned cutters:

- Maintain SAR readiness.
- Maintain ice rescue capabilities.
- Report ice conditions and make recommendations regarding vessel traffic management, including vessel capability and waterways closure recommendations.
- Report and correct aids to navigation (ATON) discrepancies.
- Coordinate cutter movements in ice areas with bridges or heavy recreational use with sector commanders.
- Optimize readiness upon return to homeport.

B.7. Public Affairs

Public affairs officers (districts and sectors), prior to the start of icebreaking operations, prepare and disseminate news releases to targeted media markets and social media detailing USCG plans for icebreaking. These releases should advise the public to:

- Watch local news media for notice of where the USCG is breaking ice.
- Call the nearest USCG sector to obtain current information on icebreaking operations in the area.
- Refrain from using waterways impacted by ice in noted areas.
- Remove docks and floats to prevent damage from moving ice floes.

B.8. Other Government Agencies

Partnerships with other government agencies (OGAs) formed through HSCs, area committees, and area maritime security committees are helpful during the winter navigation season. OGAs include:

- North American Ice Service (NAIS).
- USACE.
- National Oceanic and Atmospheric Administration (NOAA).
- National Ice Center (NIC).
- National Weather Service (NWS).
- U.S. Customs and Border Protection (CBP).
- U.S. Border Patrol (USBP)
- U.S. Geological Survey (USGS).
- Department of Energy (DOE).
- State and local agencies.
- State and local emergency managers.

Refer to Section D: DOMICE Tools, Resources, and Capabilities for more information on these resources.

B.9. Canada

Canada and the U.S. share a mutual interest in providing commercial icebreaking assistance in the Great Lakes and St. Lawrence Seaway. Leverage Canadian resources to improve coordination of effort and effectiveness of resources to maximize maritime mobility.

- CCG.
- Canadian Ice Service (CIS).
- Transport Canada.

B.10. Other Stakeholders

In addition to the USCG, OGAs, and Canada, various industry and public entities have a stake in DOMICE.

B.10.a. Public

Frozen waterways might sometimes negatively affect the public, but they can also serve as both a livelihood and recreation for public users. Public use of frozen waterways include:

- Commercial and recreational ice fishing, including tribal.
- Snowmobiling.
- Ice hockey/skating.
- Sports (e.g., hunters, ice fishers).
- Access to island communities.

B.10.b. Industry

The following industry stakeholders include:

- Carriers.
- Facilities.
- Commercial icebreaking providers.
- Pilots.
- HSCs.
- Commercial fishers.
- Tribal fishers.
- Ferries.

Districts and sectors have working relationships and business rules with maritime industry stakeholders. Business rules address how to submit movement reports and icebreaking assistance requests, and indicate when that assistance will be needed.

The business rules also address how requests are prioritized, processes for addressing prolonged vessel queue times, and management of convoys. Refer to your district's commercial assistance policy and Appendix C: Example Convoy and Vessel Queuing Procedures for further guidance.

B.10.b.(1). Recreational Users

Recreational use can lead to conflicts with shipping, and icebreaking associated with shipping can create hazards not understood by recreational users of ice. Waterways are principal routes for commerce, and freedom of navigation might take precedence over recreational use.

Manage such conflicts on a case-by-case basis, striking a balance between public use and facilitating navigation or commerce. In many cases, waterways managers can reduce or even eliminate conflicts among user groups by facilitating communication. Often, industry can adjust routes or schedules to minimize conflicts. Likewise, recreational event organizers can change schedules and locations to avoid shipping or icebreaking operations. Icebreaker commanding officers (COs) can plan routes to avoid traditional areas of heavy recreational ice use when possible. Unnecessary transits through heavy recreational use areas create public dissatisfaction irrespective of legal authorities (i.e., just because we can, does not mean that we should.). However, some situations warrant icebreaking in high-use areas. In such cases, leverage public affairs engagement with stakeholders for advance notice of activities that might affect recreational users.

Section C: DOMICE Fundamentals

C.1. DOMICE Areas

Each district defines its DOMICE areas. Refer to your unit SOP for more information.

C.2. Commercial Assistance Plan

Per reference (h), Domestic Icebreaking Operations Policy, COMDTINST 16151.1 (series), each district is required to develop and maintain a commercial assistance plan for its respective AORs. The USCG seeks to maximize overall maritime mobility when ice impedes vessel movements on the Great Lakes. In many circumstances, commercial providers can contribute toward achieving this goal.

Appendix D: Example Commercial Assistance Plan provides an example of a commercial assistance plan that could be useful during ice season.

C.3. Operational Priorities

Recognizing the USCG might not be able to respond to all requests for assistance, or in all ice conditions, units conducting USCG domestic ice operations use the following priority order for service per reference (h):

1. SAR and PWCS.
2. Urgent response to vessels at risk of a hazardous situation.
3. Exigent community services:
    a. Flood control and relief.
    b. Icebound community support for food, fuel for heat or energy, or medical assistance.
4. Facilitation of navigation and commerce.

Further delineation of icebreaking priority, as well as integration of other USCG missions, is at the discretion of individual district commanders in order to meet emergent conditions. District commanders establish any permanent priority assignments in applicable district instructions and report any temporary non-icebreaking assignments in the narrative summary of the end of season report.

See reference (h) for detailed guidance on operational priorities.

C.3.a. SAR

SAR is a challenging mission to execute during ice season. Freezing air and water temperatures significantly decrease survivability time for subjects trapped in the water or on the ice, making SAR response time critically important. Use resources with the shortest response time while ensuring the safety of personnel and equipment. Helicopters typically have the shortest response time, but, depending on the circumstances, surface assets are sometimes a better option. Some USCG stations also have special ice rescue capabilities, which are discussed further in this section.

C.4. Tiered Waterways

District commanders and sector commanders work with HSCs and local stakeholders to establish and document, in a publicly available plan or notice, waterways priorities for facilitation of navigation per the tiered waterways system defined below.

C.4.a.(1). Tier One

Tier one waterways are waterways connecting the Marine Transportation System or other navigable waterways deemed highest priority due to geographical location or importance of cargo to public health and safety (e.g., heating oil, power plant fuel, food, etc.).

C.4.a.(2). Tier Two

Tier two waterways are navigable waterways through which cargo of significant economic importance to a region moves, or waterways that connect tier one and tier three waterways.

C.4.a.(3). Tier Three

Tier three waterways are federally maintained waterways within a port, or other navigable waterways between tier two waterways and commercial facilities, or small, year-round ports hosting multiple users. The number of vessel transits or the economic value to the region determines this.

C.4.a.(4). Tier Four

Tier four waterways are wholly private or non-federally maintained waterways, piers, or docks.

NOTE: **District commanders might further define waterways priorities in their respective icebreaking instructions.**

C.5. Cargo Priorities

Following a prolonged waterway closure, when formulating a procession order, conflicts might develop among various service industries over which cargo moves first. To resolve these conflicts, DOMICE decision makers look to maritime industry stakeholders to establish cargo priorities (i.e., heating oil over coal, or gas-diesel over iron ore). Absent a decision by industry leaders, District/Sector Marine Transportation System Recovery Unit (MTSRU) can help establish a priority for cargo movement.

C.6. Ice Terminology

Standard ice terminology aids waterways managers, stakeholders and the public with having a common way of understanding, reporting, and disseminating ice information. The following provides definitions and illustrations of the ice terms commonly used by the Coast Guard, OGAs, and industry. The Coast Guard's ice terminology is based on the World Meteorological Organization's terminology database.

C.6.a. New Ice

A general term for recently formed ice that includes:

- Frazil ice.
- Grease ice.
- Slush.

These types of ice are composed of ice crystals that are only weakly frozen together, if at all, and have a definite form only while they are afloat. Frazil ice is the most commonly used term in the USCG.

C.6.a.(1). Frazil Ice

Fine spicules or pieces of ice suspended in water.

Figure 2-1 Frazil ice

C.6.a.(2). Grease Ice

A later stage of freezing than frazil ice where the crystals have coagulated to form a soupy layer on the surface. Grease ice reflects little light, giving the water a matte appearance.

Figure 2-2 Grease ice

C.6.a.(3). Slush

Snow that is saturated and mixed with water on land or ice surfaces, or as a viscous floating mass in water after a heavy snowfall.

Figure 2-3 Slush ice

C.6.b. Nilas

Also known as “new ice with finger rafting.” Nilas are thin, elastic crusts of ice, easily bending on waves and swell, and under pressure growing in a pattern of interlocking fingers (finger rafting). Nilas have a matte surface and can measure up to 4 inches in thickness.

Figure 2-4 Nilas (new ice with finger rafting)

C.6.c. Pancake Ice

Predominantly circular pieces of ice 1 to 10 feet in diameter, up to 3 inches in thickness, with raised rims due to the pieces striking against one another. Pancake ice can rapidly form over wide areas of water.

Figure 2-5 Pancake ice

C.6.d. Cakes

Also known as “ice cakes.” Cakes are relatively flat pieces of ice less than 60 feet across. Small cakes are less than 6 feet across.

Figure 2-6 Cakes (ice cakes)

C.6.e. Floes

Any relatively flat piece of ice 60 feet or more across. Floes are subdivided according to horizontal extent as follows:

- Small floe: 22-109 yards (20-100 meters) across.
- Medium floe: 109-545 yards (100-500 meters) across.
- Big floe: 545-1.1 nautical miles (500-2000 meters) across.
- Vast floe: 1.1-5.5 nautical miles (2-10 kilometers) across.
- Giant floe: More than 5.5 nautical miles (10 kilometers) across.

Figure 2-7 Floe

C.6.f. Brash Ice

Accumulation of floating ice made up of fragments not more than 6 feet across, forming from the wreckage of other forms of ice.

These conglomerations can coalesce and refreeze into irregularly shaped masses, usually with sharp projections. Brash ice can extend all the way to the bottom of a waterway.

Figure 2-8 Brash ice

C.6.g. Fast Ice

Ice that forms and remains fast (immobilized) along the coast.

Fast ice might attach to the shore, to an ice wall, to an ice front, between shoals, or grounded icebergs. Vertical fluctuations might occur during changes of sea level. Fast ice can be formed “in-situ” from water or by freezing of floating ice of any age to shore and can extend a few meters or several hundred kilometers.

Fast ice is so firmly frozen into place that wind and water currents cannot dislodge it.

Figure 2-9 Fast ice

C.6.h. Drift Ice

Floating ice, other than fast ice, no matter what form it takes or how it is disposed, where the concentration is $^{6}/_{10}$ or less of surface area.

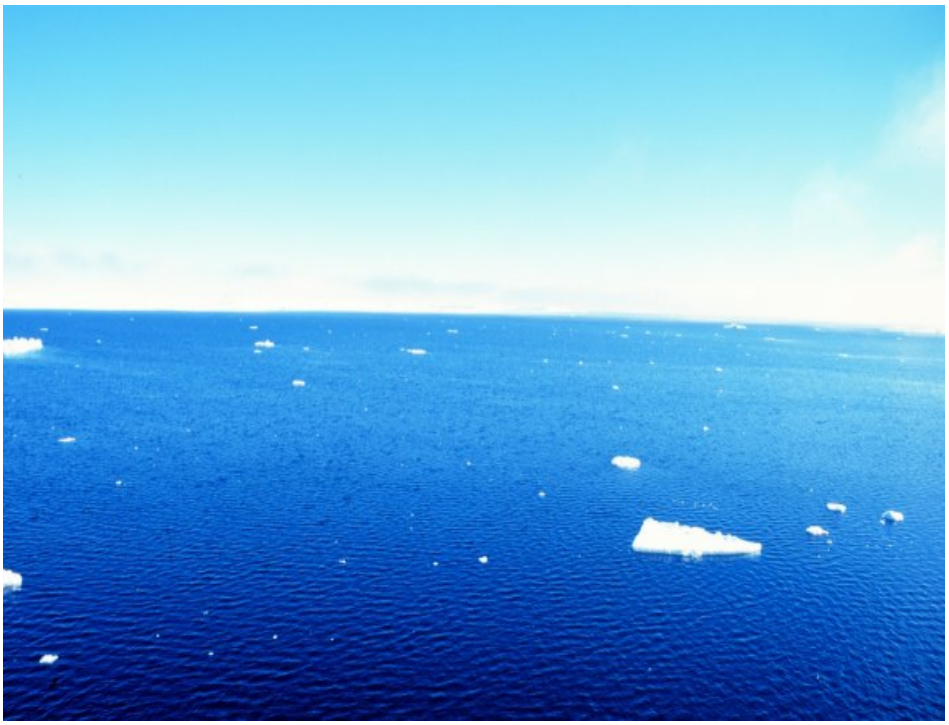

Figure 2-10 Drift ice

C.6.i. Pack Ice

Floating ice, other than fast ice, no matter what form it takes or how it is disposed, where the concentration is $^{7}/_{10}$ or greater.

Figure 2-11 Pack ice

C.6.j. Ice Jam

An accumulation of broken ice caught in a channel or river that restricts water flow, possibly creating a dam-like structure. The restriction has the potential to create localized or upriver flooding.

Figure 2-12 Ice jam

C.6.k. Fractures

Breaks or ruptures through very close pack ice, compact ice, consolidated ice, fast ice, or a single floe. Fractures might contain brash ice or be covered with nilas or young ice, and might vary in size from a few yards to several nautical miles. Two types of fractures commonly referenced in USCG icebreaking are:

- Cracks.
- Leads.

C.6.k.(1). Crack

A fracture of fast ice or a single floe, followed by separation ranging from a few inches to 1 yard that is not navigable by ship.

Figure 2-13 Crack

C.6.k.(2). Lead

A fracture or passageway through ice that is navigable by a vessel. Variations include:

- Blind lead: A lead blocked at one end (dead end).
- Shore lead: A lead between the pack ice and the shore.
- Flaw lead: A lead between pack ice and fast ice.

Figure 2-14 Lead

C.6.l. Ice Edge

The boundary, at any given time, between the open sea or lake and ice of any kind, whether drifting or fast.

Figure 2-15 Ice edge

C.6.m. Deformed Ice

Three types of deformed ice commonly referenced in USCG icebreaking are:

- Rafted ice.
- Ridged ice, also known as pressure ridges.
- Hummocked ice.

C.6.m.(1). Rafted Ice

Ice formed by one floe overriding another. Some parts of the overlap traps water, which might freeze and cement two floes together. Other parts trap air and take on the characteristic white appearance.

Figure 2-16 Rafted ice

C.6.m.(2). Ridged Ice

Also known as “pressure ridges.” Ridges on the surface of sea or lake ice, caused by compression or lateral movement.

Figure 2-17 Ridged ice

C.6.m.(3). Hummocked Ice

Ice piled haphazardly, one piece over another to form an uneven surface. When weathered, it has the appearance of smooth hills or mounds. Hummocked ice is not commonly encountered during ice season.

C.6.n. Rotten Ice

Ice honeycombed due to melting and in an advanced state of disintegration. Rotten ice appears transparent (dark) when saturated with water.

Figure 2-18 Rotten ice

C.6.o. Level Ice

Also known as “plate ice.” Ice unaffected by deformation. Level ice is flat with approximately uniform thickness and without ice ridges or windrows.

Figure 2-19 Level ice (plate ice)

C.6.p. Refrozen Ice

Ice formations that have broken apart and refrozen back together again.

Figure 2-20 Refrozen ice (on a waterway)

C.6.q. Skim Ice

Frazil ice that has frozen together but does not yet exhibit tensile strength. Ripples might move through skim ice.

Figure 2-21 Skim ice

C.6.r. Snow Covered Ice

Ice covered with snow.

Figure 2-22 Snow covered ice

C.6.s. Frost Smoke

Also known as “lake fog” or “lake smoke.” Evaporation fog or steam fog formed over a body of water overlain by significantly colder air. It appears over openings in the ice or leeward of the ice edge and can persist while ice is forming.

Figure 2-23 Frost smoke

C.7. Lake Ice Terminology

The following are additional ice terms used on the Great Lakes.

C.7.a. Lake Ice

Ice formed on a lake, regardless of observed location. Nearly all ice on lakes can be classified as either “blue” or “white.” Blue ice consists of closely packed water crystals with relatively few impurities. White ice incorporates large quantities of air.

Figure 2-24 Lake ice

C.7.b. Bare Ice

Ice without snow cover.

Figure 2-25 Bare ice

C.7.c. Polynya

A non-linear shaped area of water enclosed by ice, typically fast ice. The area of water remains constant in size and can consist of new ice, brash ice, or nilas.

Figure 2-26 Polynya

C.7.d. Ridged Ice

Also known as “rubble.” Ridged ice is a mixture of coarse broken plate and brash ice piled haphazardly atop one another in the form of ridges or walls.

A ridged ice zone, also known as a “rubble field,” consists of the same type of ice that has accumulated over a large area due to strong winds.

Figure 2-27 Ridged ice field

C.7.e. Windrows

Rows of ice piles formed by drifting masses of floes and cakes pushed against the shore or against fast ice by the wind. Windrows continue to grow as long as the wind persists.

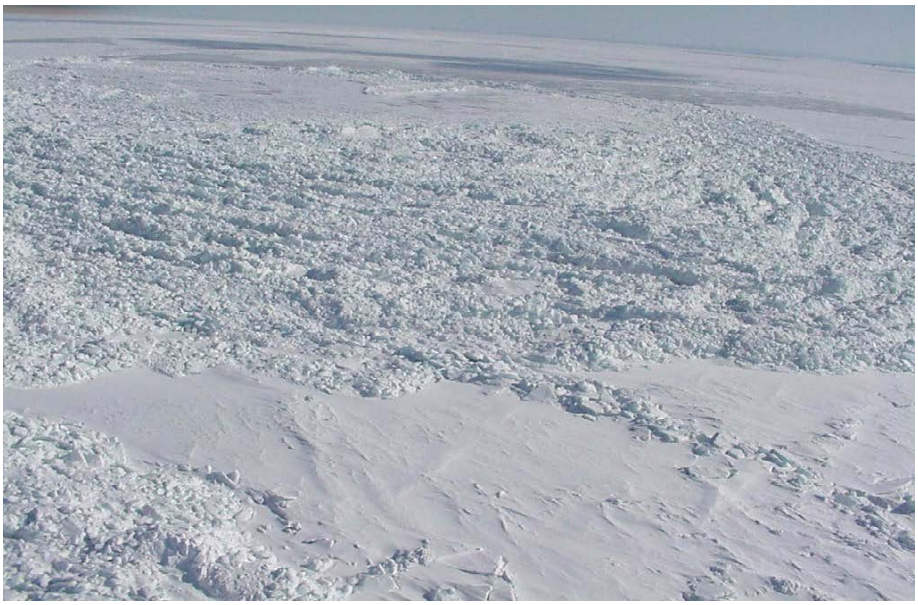

Figure 2-28 Windrows

C.7.f. Belts and Stripes

Long, narrow bands of floating ice formed under the influence of wind, swell or current, and detached from a main mass of ice.

Figure 2-29 Belts and stripes

C.7.g. Shore Ice

A basic form of fast ice that is compact ice cover attached to the shore or grounded in shallow water.

Figure 2-30 Shore ice

C.8. Ice Coverage

The ratio of water surface covered by ice to the total surface area at a specific location or over a defined area, always reported in tenths.

For example, if 70 percent of a specific location or over a defined area is covered by ice, report ice coverage as “seven-tenths coverage.” Coverage applies not only to ice in a channel, but also to waters around the channel.

C.9. Ice Thickness

Reports from vessels and stations generally provide the most accurate ice thickness reports. However, several online products produced by the NIC, CIS, and Great Lakes Environmental Research Lab exist. Those products model and predict regional ice coverage and thickness.

NOTE:

Ice thickness cannot be accurately measured or estimated by observation from the air.

C.10. Ice Concentrations

The ratio of surface water covered by ice to total surface area at a specific location or over a defined area, reported the same way as ice coverage. The following illustrates ice concentrations:

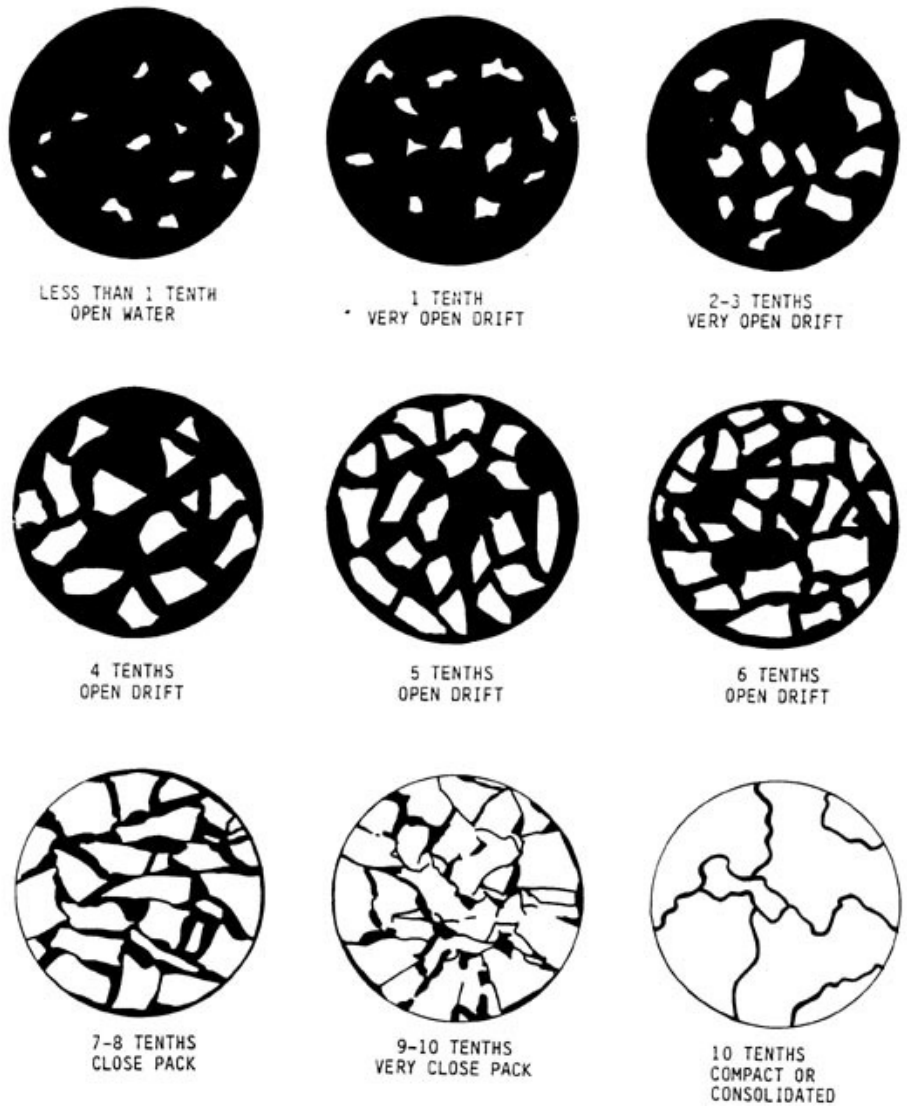

Figure 2-31 Ice concentrations

C.11. ATON	Two main types of ATON managed during ice season are seasonal and in-danger.
C.11.a. Seasonal ATON	Seasonal ATON requires removal from the water prior to the designated Light List date. If ice precludes meeting that date, the aid remains untouched and the discrepancy response factor deferred until weather permits correcting the discrepancy. If ice pulls the aid off station, the aid remains in that location until ice recedes and weather permits safe recovery.
C.11.b. ATON in Danger	District (dpw) directs procedures to follow in a case of ATON in danger. Categories are: • ENDR: When endangered by ice, ATON is replaced with a more ice-resistant hull. • ENDN: When endangered by ice, aid is removed until ice has cleared or the danger is past. • SEAR: ATON is replaced with a more ice-resistant hull on a date specified in the Light List. • SEAN: ATON removed on date specified in the Light List. These categories are determined using local knowledge and history.
C.11.c. Other ATON	Other ATON potentially relevant in icebreaking are NOAA buoys and private ATON. Refer to the Light List for more information.

Section D: DOMICE Tools, Resources, and Capabilities

D.1. District Resources

Districts have the following resources to assist with the DOMICE mission:

- District cutters.
- Air stations.
- Port recovery specialist (PRS) and MTSRU.

D.1.a. District Cutters

A variety of district cutters performs the icebreaking mission. In some cases, vessel designs include considerations to enable icebreaking; in other cases, inherent attributes enable participation in the mission.

The following outlines icebreaking capabilities of district cutters used in DOMICE management. See reference (i), Domestic Icebreaking Tactics, Techniques, and Procedures (TTP), CGTTP 3-91.9 (series), for detailed information and capabilities of these platforms.

	240’ WLBB (medium ice breaker)	225’ WLB (light ice breaker)	175’ WLM (light ice breaker)	140’ WTGB (medium ice breaker)
Length (feet)	240	225	175	140
Beam (feet)	58	46	36	37.5
Draft (feet)	16	13	8	13
Endurance (days)	10	21	3	4
Max Ice Thickness (inches at 3 knots)	32	14	9	22
Max Ice Thickness (inches while backing and ramming)	42	36	18	36

D.1.b.
Air Stations

Air assets conduct ice reconnaissance and ATON verification flights at the request of sector commanders. An over flight by a USCG air asset can be a useful tool in operational planning and monitoring. The over flight can provide real-time conditions and information contributing to vessel routing, operational prioritization, and avoidance of particularly difficult areas.

Refer to unit SOP for:

- Scheduling air support.
- Auxiliary air support.
- Hoist ops for training.

During periods of ice cover, small boat stations are often unable to support hoist op needs of local air stations. They look to cutters for support.

HH-65s and HH-60Js conduct aerial ice surveys. On occasion, fixed wing aircraft, including Canadian assets, also support icebreaking operations. Sector commanders engage directly with air station operations officers or collateral duty ice officers to request aircraft support. In the request, the ice officer clearly defines the mission objectives for each flight, including:

- Geographic area of focus.
- On-scene time.
- Desired information and format.
- Availability of sector/cutter ice observer.

D.1.b.(1).
CG Auxiliary Air

An auxiliary asset can be useful to supplement the over flight capability that the servicing USCG air station provides. Aircraft capabilities, such as range, on-scene time, and imagery capability vary widely. Ongoing outreach is the sector commander's best tool to leverage this capability effectively, where available.

D.1.c.
Port Recovery Specialist/ MTSRU

Activate PRS/MTSRU when ice conditions exceed seasonal norms and reach levels that might adversely impact our ability to conduct icebreaking operations necessary to meet commerce demands.

MTSRUs are public-private partnerships that include a wide range of port stakeholders dedicated to port recovery operations.

NOTE: **Some sectors have a PRS/MTSRU on staff and perform the same function as district PRS/MTSRUs at the tactical level.**

D.2. Sector Resources

The sector includes a variety of resources helpful in the execution of the DOMICE mission:

- Command centers.
- VTS.
- Marine safety units (MSU).
- Sector cutters.
- Stations.
- Aids to navigation team (ANT).
- CG Auxiliary.

D.2.a. Sector Command Center

The sector command center (SCC) provides valuable information and coordination capability to OGAs and port partners. The SCC operates 24 hours a day, seven days a week and performs three primary functions:

- Command and control.
- Situational awareness.
- Information management for its AOR.

D.2.b. Vessel Traffic Service

These fixed prevention units conduct operations to facilitate efficient and safe transit of commercial vessel traffic along high-density routes in inland and coastal areas. Vessel traffic service (VTS) coordinates commercial vessel movement through specified areas using communications, surveillance, and command and control, and supports USCG operations by providing domain awareness.

D.2.c. Marine Safety Units

These fixed prevention units, located geographically distant from sector headquarters and staff, conduct operations through a range of prevention activities. This includes inspections, investigations, and waterways management in support of the sector.

During ice conditions, MSUs provide valuable ship-specific information to ice officers to assist them in directing ship traffic and movement.

D.2.d.
Sector Cutters

The WYTL is a class of fifteen tugs used for light icebreaking. See reference (i), Domestic Icebreaking Tactics, Techniques, and Procedures (TTP), CGTTP 3-91.9 (series), for detailed information on this platform.

65’ WYTL (medium ice breaker)	
Length (feet)	65
Beam (feet)	19
Draft (feet)	6
Endurance (days)	2
Max Ice Thickness (@3knots)	12 inches
Max Ice Thickness (backing and ramming)	18 inches

D.2.e. Stations

Stations are multi-mission units, but the ability to conduct an ice rescue is dependent on their capabilities and the ice conditions. Stations conduct operational risk management assessments to determine whether to accept a mission. Unit COs or officers in charge (OICs) and the SAR chain of command might implement additional limitations, as conditions warrant, to manage crew risk, endurance, and safety. Coordination with state and local ice rescue-capable agencies might mitigate any loss of USCG ice rescue capabilities.

D.2.f.
Special Purpose Crafts

Several types of special purpose crafts used in ice regions are unique in their performance of an authorized mission and possess capabilities that the standard boat fleet cannot meet. Some stations have special purpose craft airboats to execute ice rescue missions and flood response. Airboats operate over water, ice, and even land for short distances. Airboats also get responders into shallow water areas and marsh areas where deep-draft vessels cannot go. They range in length from 18 feet to 24 feet. In cases where a vessel becomes beset, and no other assets are available, an airboat could be used for logistical support or medical evacuation.

D.2.g. Aids to Navigation Teams

An ANT inspects, maintains, services, positions, and relieves assigned floating and fixed ATON per existing directives. ANTs also evaluate ATON effectiveness within their AORs.

While ANTs do not normally perform missions other than ATON, the facilities available to, and experience level of, assigned personnel make these units capable of performing other USCG missions.

ANT OICs are the best source of information on ATON and waterways conditions within a geographical area.

D.2.h. CG Auxiliary

An auxiliary asset might be a useful supplement to the patrol capability that the servicing USCG station can provide. Manning, equipage, training, and capability vary widely among auxiliary flotillas. Ongoing outreach is the sector commander's best tool to leverage this capability effectively.

D.3. Other Useful Resources

The following are other useful icebreaking resources for waterways managers.

D.3.a. Nautical Charts

Updated nautical charts are an essential tool for the sector commander. A properly prepared nautical chart can be extremely useful as a job aid in the tactical planning process. It can be set up to reflect critical waterway information, including:

- AOR boundaries.
- Tier boundaries.
- Known recreational ice use areas.
- Ice damming regions.
- Waterfront facilities.
- ATON.
- Shipping routes.
- Vessel lay-up locations.
- Convoy and queuing muster points.
- Common chart features inherent to any NOAA chart.

Typical preseason planning includes preparation of a set of regional charts with this information for use both in the command center and within the Waterways Management Division/VTS.

D.3.b. Command and Control Office Information Exchange	Sector commanders ensure personnel associated with the DOMICE mission have appropriate message drafting and release authorities within C2OIX. Local policies exist to address using this application in support of operations.
D.3.c. Memorandum of agreement	An MOA between the U.S. and Canada provides coordination for icebreaking activities between the USCG and CCG on the Great Lakes. The original MOA came into effect in 1980 and was most recently reaffirmed by the Assistant Commissioner of the Central and Arctic Region, CCG, and the Director of Marine Transportation Systems, USCG, in November 2015.
D.3.c.(1). Lock/ Canal Dispatchers	Lock and canal dispatchers are key port partners for ice operations management. In certain regions, lock closures and canal restrictions during the winter navigation period result in certain transit routing options or waterways closing. Sector commanders are apprised of restrictions and lock closure schedules and related impacts on traffic. As the winter navigation season concludes, commercial maritime interests begin staging vessels for passage through the locks to resume trade. As this period approaches, sector commanders stage icebreakers to conduct track preparation and prepare for maritime traffic arrival. During periods of concurrent lock and ice operations, communication with lock dispatchers assists with timing vessel movements and managing a vessel queue. In certain instances, lock operation might not be possible because of ice jamming above the lock. In such a scenario, an icebreaker might conduct flushing operations to support future lock operation.
D.3.d. OGAs	OGAs are important partners in the DOMICE mission. In many cases, your OGA counterparts have the tenure and expertise in a waterway or region to recognize long-term trends and provide historical context for seasonal events/anomalies. OGA counterparts often maintain relationships and contacts within the maritime industry that are essential for effective execution of the DOMICE mission.
D.3.e. North American Ice Service	The NAIS is an international partnership of the CIS, the International Ice Patrol, and the NIC that leverages their combined strengths to provide ice analysis to meet the needs of maritime interests of the U.S. and Canadian governments.

D.3.f. USACE	USACE has responsibility for flood control and determines if icebreaking might assist in regulation or operation of an affected waterway. Upon request of the appropriate USACE authorities, the USCG can provide icebreaking to mitigate floods and hazardous water stages caused by ice obstructions. The USCG might provide icebreaking for flood control in direct response to a request from an OGA or private interest. However, since USACE has responsibility for flood control, consult with appropriate USACE officials before undertaking icebreaking for flood control to determine if the operation might interfere with regulation or operation of affected waterways. Conduct icebreaking for flood control only to the extent that USCG resources can be used effectively and safely.
D.3.f.(1). Cold Regions Research and Engineering Laboratory	The Cold Regions Research and Engineering Laboratory (CRREL) solves interdisciplinary and strategically important problems by applying science and engineering with unique competencies related to Earth's cold regions. Specifically relevant to the DOMICE mission are CRREL's work in ice analysis, ice dam development, and water-level monitoring, as well as research in geospatial information systems and water resources.
D.3.g. NOAA	NOAA has nautical charts, water temperatures, and weather stations, and can be a source for satellite imagery for an AOR.
D.3.g.(1). National Ice Center	The NIC is a multi-agency operations center operated by the U.S. Navy (USN), NOAA, and USCG. The NIC mission is to provide ice and snow products, ice forecasting, and other environmental intelligence services for the U.S. government. NIC produces bi-weekly ice charts.
D.3.h. National Weather Service	NWS provides daily, monthly, and long-range weather forecasts, as well as hazardous weather warnings, freezing sprays warnings for marine traffic, etc., on its Climate Prediction Center page.
D.3.i. U.S. Geological Survey	The USGS is the nation's largest water, Earth, biological science, and civilian mapping agency. It collects, monitors, analyzes, and provides information on natural resource conditions. State USGS representatives routinely work with waterways managers to provide important information about ground water, stream flow, ice measurements, and snow pack characteristics. They also assist with DOMICE operational planning and risk mitigation. USGS representatives provide snow-melt calculations and calculations of how much "water" the snow pack can hold before reaching saturation and transferring that water to a stream or river. They also provide ice thickness monitoring to advise when ice-jam flooding is likely.

D.3.j. State and Local Agencies	State and local agencies often have a variety of useful personnel, capabilities, and ice-capable vessels. • State and local emergency managers. • Fire and police departments. • Departments of natural or marine resources, and environmental quality. • Island support. • Flood control. • Hovercraft and airboats.
D.3.j.(1). State and Local Emergency Managers	Although the normal request process includes state and federal emergency management personnel, in some cases a sector is contacted directly with a community service request. In these cases, the USCG representative attempts to obtain the following information: • Name, title or position, and contact information of the requesting party. • Nature and urgency of the situation. • Specific location where assistance is required. • Any local action taken to mitigate the problem. • Amplifying information and recommendations.
D.3.j.(2). Fire and Police Departments	Many fire and police departments have marine divisions equipped with icebreakers or ice-capable vessels of varying size and capability. These vessels and their crew might be equipped to address icebreaking needs in navigationally restricted areas where USCG icebreakers are unable to operate. As first responders, fire or police departments might provide waterways access during emergency response situations.
D.3.j.(3). Departments of Natural Resources or Departments of Environmental Quality	In some regions, the Department of Natural Resources (DNR) or Department of Environmental Quality (DEQ) is equipped with ice-capable vessels. These vessels might best address narrow or shallow channels, harbors, and navigation areas where it is impracticable to operate a USCG icebreaker. As a best practice, sector commanders collaborate with DNR/ DEQ partners when ice impedes waterways navigation.

D.4. Canadian Resources	The proximity of the international border and shared commercial interest in the waterways necessitate collaboration and cooperation between Canada and the U.S. for DOMICE management. The following Canadian resources have a stake in the DOMICE mission.
D.4.a.(1). Canadian Ice Service	The CIS provides the most accurate and timely information about ice in Canada's navigable waters. CIS produces a daily ice chart, promotes safe and efficient maritime operations, and helps protect Canada's environment.
D.4.b. Transport Canada	Transport Canada manages everything related to transportation for Canada and is responsible for clearing vessels to sail following a marine casualty or pollution event.
D.4.c. Marine Communications and Traffic Services Center	The Marine Communications and Traffic Services (MCTS) Center is a critical information hub during operations on several shared U.S. and Canadian waterways. Of particular use in the lower Great Lakes, MCTS Sarnia, Ontario, operates as the VTS for the Great Lakes above the Welland Canal. Similar to a USCG VTS, the MCTS monitors all vessel traffic via AIS in addition to maintaining a communication watch with each mariner at predetermined call-in points. The MCTS helps ice officers determine arrival and departure times, monitor vessel progress in ice, and collect and disseminate mariner-developed ice reports. In addition, the MCTS is particularly well-equipped to assist with managing a vessel queue during prolonged waterways closures (greater than 24 hours) or in organizing vessel convoys.
D.4.d. Regional Operations Center	Manages a fleet of icebreakers that work the arctic and Great Lakes. Regional Operations Center (ROC) Montreal is the dispatch point for Arctic (summer) and Great Lakes (winter) icebreaking. The ROC for the Canadian Central and Arctic Region is located in Montreal, Quebec, and staffed with a full-time ice specialist during the winter navigation season. Channel asset coordination and CCG ship (CCGS) tasking through the ice specialist at the ROC. The ice specialist maintains a 24-hour watch and assists with coordinating icebreaking services to support Canadian industry interests. The ROC meteorologist produces a daily weather package for the Great Lakes and St. Lawrence Seaway.
D.4.e. CCG	The CCG is an agency under Fisheries and Oceans Canada and is responsible for the safety, accessibility, and security of Canadian waters. The CCG and USCG partner on the Great Lakes each winter to perform the largest DOMICE operation in the U.S.

D.4.f. CCG Ship Capabilities

The following chart outlines icebreaking capabilities of CCGSs used in ice management. Additional characteristics and information of the CCG icebreaking fleet is at CCG Icebreaking operations services.

	High Endurance Multi-Tasked	Medium Endurance Multi-Tasked	Medium Icebreaker
Length (feet)	272	229	322
Beam (feet)	53	45	65
Draft (feet)	20	17	24
Endurance (days)	120	58	108

D.5. St. Lawrence Seaway

The Great Lakes-St. Lawrence Seaway is a deep draft waterway including 13 Canadian and two U.S. locks, extending 3,700 kilometers (2,340 miles) from the Atlantic Ocean to the head of the Great Lakes, in the heart of North America. The St. Lawrence Seaway portion of the system extends from Montreal to mid Lake Erie.

The St. Lawrence Seaway Management Corporation (SLSMC) and the St. Lawrence Seaway Development Corporation (SLSDC) share administration of the St. Lawrence Seaway.

D.5.a. St. Lawrence Seaway Management Corporation

The SLSMC is a not-for-profit corporation responsible for the movement of marine traffic through the Canadian Seaway facilities, which consist of 13 of the 15 locks between Montreal and Lake Erie. The corporation plays a role in ensuring that the waterway remains a safe and well-managed system focused on promoting efficiency. SLSMC is responsive to the needs of shipping interests, ports, marine agencies, and provincial and state jurisdictions.

D.5.b. St. Lawrence Seaway Development Corporation

The SLSDC is a government corporation, created by statute, to construct, operate, and maintain that part of the St. Lawrence Seaway within U.S. territorial limits between the Port of Montreal and Lake Erie. Trade development functions aim to enhance Great Lakes/St. Lawrence Seaway system use without respect to territorial or geographic limits.

SLSDC serves the U.S. intermodal and international transportation system by improving operations and maintenance of a safe, reliable, efficient, and environmentally responsible deep-draft waterway, in cooperation with its Canadian counterpart.

SLSDC headquarters is in Washington, D.C. Operations are at the two U.S. Seaway locks, Eisenhower and Snell, in Massena, N.Y.

D.6. Communications

Frequent and deliberate communications are essential to the successful and efficient execution of DOMICE operations. The collaborative nature of the mission hinges on partnerships among the USCG, CCG, and maritime industry stakeholders. Ongoing communication enables transparency in operational planning and supports alignment among interested parties.

DOMICE communications keeps partners and stakeholders informed of observed ice conditions, COTP restrictions, and escort/convoy information.

D.6.a. Ice Information

The USCG does not make ice forecasts or offer risk assessments to mariners and related interests. When available, the USCG disseminates recently observed or reported ice conditions and ice information from the NWS or other responsible agencies. Clearly identify the source and timing of the ice information.

D.6.b. Teleconferences

Prior to and during the winter navigation season, stakeholders from district (dpw) staff, participating sector staffs, and stakeholders from regional OGAs participate in operational planning calls. Demands from industry, as well as current and forecasted weather and ice conditions, determine the frequency and duration of calls. This call is typically held prior to industry outreach. A representative from the district (dpw) staff facilitates the phone call if ice operations span multiple AORs. Each sector commander and OGA, as appropriate, provides relevant content, including:

- Current and forecast weather.
- Current and anticipated vessel traffic.
- Commercial service provider activity.
- Current and future force lay-down (next 24 hours).
- Cutter casualty and logistics requirements.

Best practices for ice officers: Use a standard script during the conference call to ensure consistency throughout the season.

D.6.b.(1). MISLE

During the ice season, record waterways closures, delays, and COTP limitations in the Marine Information for Safety and Law Enforcement (MISLE) system per:

- Reference (j), Marine Safety Manual, Volume I, Administration and Management, COMDTINST M16000.6 (series), chapter 12.
- Reference (k), Marine Transportation System Recovery Planning and Operations, COMDTINST 16000.28 (series).
- MISLE User Guides provided on the MISLENET website.

D.6.b.(2). Common Assessment and Reporting Tool

The Common Assessment and Reporting Tool (CART) is a web-based program used to track port status during Marine Transportation System (MTS) recovery operations. Use CART to catalog and monitor the status of essential elements of information (EEI), which include 22 varied components. CART also provides the MTSRU with situational awareness during a recovery effort.

Sector commanders populate and maintain baseline and incident specific EEI data as directed by area and district commanders. In addition, they use CART to record and report EEI related to MTS disruption events. CART in turn provides an information database and automated report generation capability for supporting incident management at all levels. Information that can be captured within CART includes:

- Waterways closures or restrictions.
- Enforcement issued.
- Seasonal alerts.
- Vessels in queue for transit through a waterway.
- MTS closures and impacts they might have on waterways.

For the purposes of ice operations, an MTS disruption is difficult to define since the nature and circumstances vary widely based on waterway type, navigation season, and the state of ongoing commerce. In determining whether an MTS disruption has occurred, sector commanders consider the input of commercial interests, port partners and stakeholders, government and municipal representatives, and icebreaker COs. If a waterway closure (defined as a waterway restriction lasting more than 24 hours) might result in a significant transportation disruption, sector commanders use CART.

In the case of a disruption, CART assists decision makers in assessing and monitoring ice conditions and any impact on critical infrastructure, waterfront facilities, vessels, and ATON within the affected waterway.

D.6.c. Radio

For radio communications, follow reference (l), Telecommunication Manual, COMDTINST M2000.3 (series), and reference (m), Telecommunication Tactics, Techniques, and Procedures (TTP), CGTTP 6-01.2 (series). When preparing a communications plan to support icebreaking operations, the sector commander considers the relevant industry, USCG, and VTS/Traffic Monitoring Service working frequencies for the area of operations.

Communicate among units via radios. If radios are unreliable, then use cell phones.

D.6.d. Record Message Traffic

Sector commanders release a daily traffic and tasking message to assigned units. The message includes:

- Anticipated traffic.
- Current tasking by geographic area.
- Forecasted tasking for the next operational period (usually 24 hours).
- COTP actions in support of units (closures, restrictions, vessel voyage requirements).

Send tasking messages per the sector commander's OPORD, IAP, SOP, etc. Sector commanders communicate updates to the daily report as they occur. Voice communications are normally most expeditious and are sufficient for updates. Send record message traffic to the SCC for distribution via:

- Radio frequencies.
- Coast Guard Data Network.
- Fax.

D.6.e. E-mail

Email is a useful tool for communication among USCG stakeholders, OGA, and industry representatives during ice operations. Preseason preparation includes validation of the DOMICE distribution list. To ensure widespread access to email traffic, it is helpful to use a shared mailbox, particularly in instances where multiple ice officers are involved in the coordination of icebreaking activities. The shared mailbox also provides external partners with a constant set of contact information despite typical USCG personnel turnover.

D.6.f. SharePoint

CG Portal provides a very capable platform for information and document sharing across multiple users. SharePoint can house relevant doctrine and TTP, describe unit operational status, and share documents. The Ninth District uses CG Portal, with sites dedicated to the command center, cutter fleet, and Icebreaking Center of Excellence. In each case, the sites provide ready access to current and reliable information necessary for the execution of icebreaking operations. Each can be viewed below:

- District Nine cutter status.
- District Nine Icebreaking Center of Excellence.
- District Nine Command Center.

D.6.g. Phone

The nature of icebreaking operations requires responsive, flexible, and on-going direct communications among decision makers to monitor current operations, adapt operational planning to on-scene conditions, and plan future operations. Voice communications via cellular phone is often the most expeditious and reliable means of relaying tactical information to assigned icebreaking units. Accordingly, a phone call often represents the most effective means of achieving clear communications in real time.

In preparation for the winter navigation season, best practices suggest sector commanders compile an accurate and up-to-date telephone list for USCG units, industry partners (vessel schedulers and operations managers), OGAs, commercial vessels, and commercial icebreaking service providers.

NOTE: **Consider operational security when conveying tactical information over an unsecured network.**

D.6.h. Situational Reports

Submitted by units to district daily, addressing icebreaking operations for that operational day. Reports can include:

- Cutter employment hours.
- Commerce data.
- Ice conditions observed.
- CO's comments/concerns.

D.7. External Communications

The following are useful resources used to communicate externally with stakeholders.

D.7.a. Broadcast Notice to Mariners

A broadcast notice to mariners (BNM) is an outreach and communications tool at the disposal of the sector commander. The BNM can be an effective tool in communicating waterway restrictions and closures, unique conditions, icebreaking and icebreaker activities, etc.

Issue a BNM once ice accumulation starts. BNMs address the following:

- Ice conditions.
- Location of ice.
- Type of ice.
- Percentage of ice concentration.
- Ice thickness.

An example BNM is in Appendix E: Example Broadcast Notice to Mariners.

D.7.b. Notice to Shipping

A notice to shipping is similar to the BNM and is prepared and released by the CCG to mariners operating in Canadian and shared waterways.

D.7.c. Safety Marine Information Broadcast

A safety marine information broadcast (SMIB) can be an effective outreach tool to communicate unusual ice conditions, waterways interruptions, or special instructions to the mariner. An example SMIB is in Appendix F: Example Safety Marine Information Broadcast.

D.7.d. Automatic Identification System

AIS is an automated tracking system used on ships and by VTS for identifying and locating vessels by electronically exchanging data with other nearby ships, AIS base stations, and satellites. AIS is used on all tankers, passenger vessels of 150 gross tonnage or greater, and other ships of 300 gross tonnage or greater (500 gross tonnage or greater in domestic voyages). The system can provide users with unique information including position, course, speed, destination, status, and cargo. This information can be useful in providing sector commanders the ability to monitor marine traffic in near real time. Several applications integrate AIS data as a layer within a geospatial information system, including:

- CG One View.
- Marine Traffic.
- Watch Keeper.

D.7.e. Federal Register and Code of Federal Regulations	Rulemaking associated with the DOMICE mission is captured in the Federal Register for viewing by interested parties. To the maximum extent possible, socialize potential rulemaking with port partners and industry stakeholders informally through dialogue and outreach, and formally through a notice of proposed rulemaking in the Federal Register. The Code of Federal Regulations (CFR) provides the COTP the necessary force of law to close segments of waterways and use other traffic management measures. See reference (f), Regulated Navigation Areas and Limited Access Areas, 33 CFR Part 165, for an example of the Great Lakes regulated navigation area that is used during the winter navigation season to protect recreational ice users and control maritime traffic flow in certain segments of the MTS.
D.7.f. Homeport	The USCG Homeport site can be used to provide ready access to unclassified information concerning: • Port and waterway conditions • Icebreaker assignments • COTP restrictions and requirements • Weather products • Contact information for port partners and the public.
D.7.g. Hotline Telephone	Some units use a dedicated telephone line to record and disseminate ice reports and other relevant information to the public. Parties without marine band radios often prefer this method.
D.7.h. Public Affairs – Communications Channels	Media interest is a natural product of ongoing, extensive icebreaking operations, particularly during especially harsh winter weather extensively affecting maritime commerce. Sector commanders professionally address media inquiries while also leveraging the engagement opportunity to promote USCG interests and conduct outreach.

D.7.h.(1). Public Affairs Guidance

Public affairs guidance (PAG) can assist sector commanders and USCG representatives in achieving clear, concise, and accurate messaging that aligns with tactical objectives and strategic intent. PAG can assist with up-to-date statistics, metrics, authorities, objectives, and noteworthy accomplishments prior to interacting with media. PAG might also prescribe certain content areas to avoid, or go as far as providing a scripted answer to address certain scenarios or subject matter. Sector commanders request PAG prior to media engagement and provide the same to assigned icebreaking units who face media inquiry. Consult the servicing district external affairs office.

D.7.h.(2). Press Release

Ice on northern U.S. waterways is a normal condition and not necessarily a significant event or marine transportation disruption. However, beginning DOMICE operations marks a decisive shift in operational focus and navigational procedures in a given region, and typically garners moderate media interest. Put out a press release at the start of icebreaking operations and another at the conclusion. In addition, communicate significant waterways disruptions, unusual conditions, or noteworthy achievements to the local media when appropriate. An example press release is in Appendix G: Example Press Release. Use servicing public affairs staffs where available.

A sector commander can leverage several media conduits to ensure navigation and recreational ice use information reaches mariners. Base media provider selection on the target audience, urgency/impact of the information, and available time frame. Outreach options vary by port or locality. Consider the following:

- Television.
- Radio.
- Social media.
- Public meeting.
- Teleconference.
- Informational flyers or fax to marinas, yacht clubs, waterfront facilities.

D.7.h.(3). Media Outreach

Foster partnerships with local media to facilitate widespread messaging, as appropriate, during a waterway interruption or closure resulting from ice.

- Radio.
- Television.
- Fax to popular social gatherings such as restaurants, bars, and clubs.
- Social media.

D.8. Reporting

Sector commanders rely on several information sources to feed tactical decision-making and to target assets appropriately throughout the ice season. The frequency, format, and content of these reports varies across district/sectors but generally includes the following specific content areas:

- Ice reports.
- Operational summaries (OPSUM).
- End of season reports.

For field units, reports can be provided in a variety of ways depending on the communication capabilities of the sender. For example, USCG network connectivity is limited or non-existent for cutters underway; therefore, reports are commonly submitted via radio, phone, or fax. While examples of reports provided in the appendices of this publication are in a particular format, use the tool that is most effective and efficient for the event.

Formats include:

- Microsoft Word or Excel files attached to email.
- Email text.
- Facsimile.
- Phone.
- Radio.
- C2OIX.
- CART.
- MISLE.

D.8.a. Ice Reports

Ice reports often represent the most accurate report of on-scene ice conditions as observed by the mariner, station crew, or icebreaker crew. While satellite imagery and forecast models provide significant utility, the level of detail, timeliness, and accuracy of an on-scene observation, by a trained or experienced observer, cannot be matched. Each assigned unit provides periodic ice reports to their sector commander.

Report types:

- Daily.
- Weekly.
- End of season.

D.8.a.(1). Daily (cutter/station)	The cutter ice report provides very specific, accurate, and detailed information regarding on-scene conditions and the impact on icebreaker effectiveness and maritime vessel traffic. The station ice report is a useful tool in tracking shore ice development and its impact on harbors, marinas, and boat basins. This report can also help determine the location and density of recreational ice users and the station's readiness status to respond to an ice-related SAR. Develop a standard format for ice reporting by cutters, station personnel, and aircrews. Tailor the report format to mission objectives and capabilities of the reporting source. An example is in Appendix H: Example Daily Ice Mission Report. • Cutter ice report. • Station ice report. • VTS ice report, commonly done every 24 hours.
D.8.a.(2). Weekly	A weekly ice report provides a compilation of daily reporting from units assigned to the icebreaking mission.
D.8.a.(3). End of Season	Per reference (h), Domestic Icebreaking Operations Policy, COMDTINST 16151.1 (series), units assigned to icebreaking operations provide an end of season report to the sector commander no later than 15 May. The report summarizes activities and provides recommendations to improve execution of icebreaking operations within the area of operations. In districts with multiple, separate but concurrent tactical operations, the sector commander consolidates lessons learned and recommendations and submits the end-of-season report to the operational commander. An example is in Appendix I: Example End of Season Report (truncated).
D.8.b. OPSUMs	OPSUMs describe what operations took place during the ice season. • Cutter OPSUMs. • Sector OPSUMs. • Weekly OPSUMs. • End of season reports.

D.8.b.(1). Cutter OPSUMs	The daily cutter OPSUM is a necessary supplement to the ongoing dialogue between a sector commander and an assigned icebreaker. The OPSUM provides a daily accounting of several reportable metrics in addition to critical logistics related information, including fuel state, crew fatigue, status of stores/supplies and hotel services. In addition, the OPSUM captures the readiness of the cutter/station and crew to perform the assigned mission. Unit SOP prescribes the format, frequency, and transmission method for the OPSUM. An example daily OPSUM is included in Appendix J: Example Daily OPSUM.
D.8.b.(2). Sector OPSUMs	The sector OPSUM, which is sometimes in the form of a situation report (SITREP), is an operational snapshot of activities with an emphasis on bottom line information and future plans. The brief feeds high-level briefings and ensures situational awareness throughout the command and control construct. An example sector OPSUM is included in Appendix K: Example Sector OPSUM. In some cases, daily (or as required) text briefs can be an effective and efficient means of briefing significant operations. Leverage the command center to provide text briefings to the chain of command.
D.8.b.(3). Weekly OPSUMs	The weekly OPSUM is a consolidated summary of daily operations, metrics, and plans from the past seven days that provides situational awareness to the operational commander for informed decision-making at the operational and strategic level. The weekly OPSUM should contain a weekly accounting of all measures of effectiveness and metrics described in reference (h), Domestic Icebreaking Operations Policy, COMDTINST 16151.1 (series), in addition to a brief summation of the most relevant operational activity. The period of report is normally 2000 Sunday through 1959 the following Sunday with the report submitted no later than 1400 on the subsequent Monday. A template for the report is in Appendix L: Example Weekly OPSUM.
D.8.b.(4). End of Season Reports	Per reference (h), units assigned to icebreaking operations provide an annual end of season report to the sector commander no later than 15 May each year. The report summarizes activities and provides recommendations to improve prosecution of icebreaking operations within the AOR. Units often choose to conduct an immediate after-action debriefing to identify strengths and weaknesses from the recent ice season. Information gathered benefits the management of future DOMICE operations. Include lessons learned in the end of season report.

NOTE: **Some districts or sectors provide statistical reports separate from end of season reports, which serve to quantify demand, resourcing and activities of units supporting icebreaking. See reference (h), Domestic Icebreaking Operations Policy, COMDTINST 16151.1 (series), for guidance on statistical reporting.**

NOTE: **Certain areas of operations divide the DOMICE season into periods to align with waterways availability due to known lock closures, vessel lay-ups, and recreational ice activity. In these cases, a sector commander might submit a period-specific report capturing data, findings, and lessons learned that are unique to that specific segment of the operation but not necessarily relevant to the entirety of the ice season.**

Include information from period reports in end of season reports.

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Chapter 3:
Ice Season Management Process

Introduction

This chapter provides an overview of considerations and actions that waterways managers at the district and sector level take before, during, and after the annual ice season.

In This Chapter

This chapter contains the following sections:

Section	Title	Page
A	Preseason	3-2
B	In-Season	3-8
C	Postseason	3-21

Section A: Preseason

A.1. Early Coordination

Efforts begin well in advance to accurately plan for the approaching domestic ice season. Sector waterways managers coordinate early with stakeholders both internally and externally to communicate operational priorities, mission demands, and resource capabilities.

A.1.a. Outreach to Plan, Coordinate, and Prepare

Open communication and transparency are essential elements of minimizing negative effects of a severe domestic ice season.

Early coordination with federal, state, and county representatives facilitates a smooth transition into the DOMICE season. At minimum, sector waterways managers conduct outreach with NWS, USGS, emergency management agencies, USACE, and other organizations and municipalities affected by navigationally significant ice conditions.

In addition, it is extremely important to maintain open communications with commercial shipping facilities and vessel agents to understand their operational capabilities. During periods of severe ice when vessel traffic slows or shuts down, it is important for district commanders to understand the consequences of not being able to facilitate scheduled deliveries.

A.1.a.(1). District Meetings with Internal Stakeholders

Prior to beginning the ice season, the district prevention department hosts a preseason DOMICE conference. Sector commanders, sector waterways management division chiefs, sector ice mission managers, dpw staffs, icebreaker COs and OICs, applicable ANT OICs, and air station DOMICE flight managers and auxiliary liaisons should be represented.

Each district preseason meeting addresses:

- Operational priorities and objectives.
- Ice season forecast.
- Required message traffic.
- Resource scheduling and capabilities.
- Procedures for requesting resources (vessels and air).
- Standard reporting requirements, forms, and data collection (CART).
- Message emphasis for industry and partners.
- Icebreaking season and severity progression.
- Best practices and lessons learned from previous ice seasons.

A.1.a.(2). Sector Meetings with External Stakeholders

Following the district preseason DOMICE conference and before the commencement of the ice season, sectors host their own preseason DOMICE conferences. The sector-led preseason meeting differs from the district preseason meeting in that the target audience is external to the USCG. Base the message communicated on the commander's intent. A review of the previous ice season, objectives, mission, priorities, weather outlook, asset capabilities, and operating areas are all suggested topics of discussion.

Sector icebreaking plans detail specific requirements of the meetings; however, the waterways management division plans and coordinates the meeting. Expected attendees include the sector commander, prevention department head, waterways division chief, ice mission manager, and all icebreaker COs and OICs.

Invite applicable representatives from federal, state, and county agencies, as well as vessel masters and businesses that regularly transit affected waterways.

Presenting to the local HSC or port safety forum and other similar audiences also helps communicate the DOMICE mission priorities and objectives.

NOTE: **Some district or sector waterways management staffs choose to conduct a single preseason DOMICE operations planning meeting that includes both internal and external stakeholders.**

A.1.a.(3). Address In-Season Ice Issues/ Concerns

Determine methods and procedures for addressing common ice concerns well before ice season begins. Include procedures to:

- Track, process, and prioritize DOMICE requests.
- Address ATON discrepancies.
- Address unscheduled asset maintenance.
- Determine and address industry projections and needs.
- Request additional support.

A.1.a.(4). Leveraging Public Affairs Guidance and Media Awareness	The district public affairs staff generates fragmented public affairs guidance (FRAGPAG) to help USCG personnel respond to inquiries. FRAGPAG includes a general statement about the operation, general information about why we conduct the mission, operational capabilities of assets, and other relevant talking points. FRAGPAG is generally available during the district preseason DOMICE conference or prior to ice season. Throughout the season, highlight the mission and communicate DOMICE mission priorities and commander's intent.
A.1.a.(5). Facility and Provider Availabilities	An understanding of facility concerns, anticipated winter throughput, cargoes, vessels, and relevant contact information is critical to the management of the DOMICE season. Preseason work focuses on obtaining this information, even if only at a general level to position the DOMICE manager to anticipate needs throughout the season.
A.1.a.(6). Confirm/Update Contact Lists	Update stakeholder point-of-contact information (e-mail, phone numbers, etc.) and test notification systems. A MTSRU conference call is highly recommended in advance of the ice season and potential marine transportation disruptions caused by the ice.
A.1.b. Review Existing/Previous Ice Season Plan	Prior to the ice season, waterways managers should review reference (h), Domestic Icebreaking Operations Policy, COMDTINST 16151.1 (series), existing icebreaking plans, applicable OPORDs, and the previous season's end of season report.
A.1.b.(1). Apply lessons learned/best practices from previous year	End of season reports conducted at the conclusion of a DOMICE season add great value to planning for future seasons. Review recent end of season reports prior to the district ice conference to help remind waterways managers of challenges and lessons learned from prior seasons. Share the report with all units that conduct operations in your AOR. An organized conference call among applicable units ensures an opportunity to provide further input, update potential concerns, and get operators and waterways mangers on the same page.

A.1.c. Review Tiered Waterway Classifications

Every district has a tiered waterway classification list. The waterway classification system helps COTPs prioritize the DOMICE mission. Waterways managers need to know the tiered system in their AOR.

Waterway classification differs among geographic regions; however, the premise is the same: each category is given a weight factor based on its importance to the port. Waterway criticality factors include:

- Petrochemical for heating, transportation, and power.
- Ferry service to islands.
- Flood response.
- SAR station.
- Military installation.
- Ferry service – commuter.
- Fishing vessels.
- Other critical cargo and commerce.

A.2. Coordination of Seasonal ATON

Buoys are particularly susceptible to ice damage and expensive to replace. Sector commanders verify that seasonal ATON operations are complete per the Light List prior to the beginning of the ice season.

A.2.a. Message Traffic Included

Sector waterways managers submit a brief status of seasonal ATON reliefs or removals, via official message traffic, to district (dpw) and appropriate icebreaking units.

Example content should include “All seasonal reliefs have been completed per volume (x) of the Light List” or “Completed with the exception of (x), with a completion date of (x).”

A.3. Determining Availability of Resources

Waterways mangers coordinate deployment plans with other sectors and districts. Consider OGA and commercial schedules

Waterways managers determine if cutter transits planned during the upcoming ice season affect DOMICE operations. Districts publish cutter schedules on CG Portal.

A.4. IAP or OPORD Development

DOMICE operation orders specify the commander's intent for a particular operation. Operation Taconite and Operation Reliable Energy for Northeast Winters are examples of recurring DOMICE operation orders. In addition, sectors can develop their own region specific DOMICE operations to support the district initiatives.

OPORDs often include relevant references, the situation, mission objectives, commander's intent, specific tasking, and service support.

See Appendix M: Example OPORD.

A.5. Training

As winter months approach, operational risks such as heavy weather, rough seas, strong winds, unpredictable icing conditions, and longer periods of darkness exist for underway icebreaking assets. Accordingly, each icebreaker CO or OIC conducts a safety stand-down in preparation for ice season.

Stand-downs focus on procedures and safety practices that highlight aspects of ice operations and mission support that present a higher level of risk, followed by risk mitigation discussions.

A.5.a. Ice observer

Coverage, thickness, and ice type are important data for the DOMICE manager. To obtain this information, a variety of sources can be leveraged, including:

- USCG cutters.
- USCG small boat stations.
- USGS.
- NWS.
- USCG air stations.
- USCG Auxiliary patrols.
- Local police and fire departments.
- Harbormasters.
- VTS centers and commercial vessel operators.

A.5.b. Ice Reporting	Develop a standard format for ice reporting by cutters, station personnel, and aircrews. Tailor the format of the report to mission objectives and capabilities of the reporting source. • Cutter ice report. ➢ Weather. ➢ Ice. ➢ Constraints. • Station ice report. ➢ Weather. ➢ Ice. ➢ Local information. • VTS ice report, commonly done every 24 hours. ➢ Weather. ➢ Ice. ➢ Cutter assignments (consider operational security when reporting cutter assignments).
A.5.c. Metrics	Capture and report required metrics per reference (h), Domestic Icebreaking Operations Policy, COMDTINST 16151.1 (series).

Section B: In-Season

B.1. Season Scope

Reference (h), Domestic Icebreaking Operations Policy, COMDTINST 16151.1 (series), describes the period of the ice season as typically beginning in mid-December when ice is determined to impede navigation. The ice season typically ends in late March or early April when ice no longer impedes navigation and temperatures are not expected to return to levels that would facilitate ice formation. During this time, per reference (a), Use of Vessels for Ice-breaking Operations in Channels and Harbors, Executive Order 7521, the USCG is charged with icebreaking operations for harbors and channels within the reasonable demands of commerce.

NOTE: **Reference (h) states that districts report specific beginning and ending date/time of their ice seasons in the narrative summary of an end of season report.**

B.2. Internal Coordination

During the ice season, contact internal entities to determine their level of interest and discuss potential waterways impacts and risks of ice operations. Coordinate closely with USCG members who have a stake in the safe and efficient operation of the port and waterways. Examples of internal stakeholders include:

- District and sector command staff.
- Other sector COTP zones.
- Command centers.
- VTS.
- Air stations.
- Station/cutter managers.
- USCG Auxiliary air operations coordinators.
- Incident management.
- Inspections and investigations.
- Intelligence.
- Public affairs.

In addition, some sectors execute DOMICE operations IAPs that are approved annually and contain relevant incident command system forms. This is done at the discretion of the sector or district commander. See Appendix N: Incident Action Plan for an example.

In determining icebreaking priorities, waterways managers must consider the capability and availability of USCG icebreaking assets. In addition, conduct pre-mission coordination with adjacent sectors when:

- An icebreaker is deployed to operate within another sector's AOR.
- An air reconnaissance flight is planned in an area where an adjoining sector AOR boundary exists.
- A closure or restriction is being imposed in an ice-covered waterway where an adjoining sector AOR boundary exists.
- An icebreaker is deployed to ice-covered waterways where an adjoining sector AOR boundary exists.

B.2.a. RFFs – USCG and USCG Auxiliary Flight Hours for Ice Condition Reporting

In most districts, operational control for district cutters normally remains with the district. However, district cutters might shift tactical control to a sector commander when directed to do so, following approval of a request for forces. Submit a request for forces (RFF) message via C2OIX to district (dpw) when such DOMICE operations support is needed or anticipated. See Appendix O: Example for an example RFF message. Procedures for using C2OIX are in reference (m), Telecommunication Tactics, Techniques, and Procedures (TTP), CGTTP 6-01.2 (series).

Sector commanders request USCG and USCG Auxiliary aircraft for air ice reconnaissance directly from the relevant air station. However, operational control for air stations and aircraft remains with the district.

Submit a request for air ice reconnaissance using USCG and USCG Auxiliary aircraft via electronic mail or telephone to the appropriate air station patrol scheduler or air station Auxiliary liaison when such DOMICE operations support is needed or anticipated. Coordinate and monitor the aircraft reconnaissance patrol, if available, and repeat the request process as the need for future air reconnaissance continues.

NOTE:

Reference (h), Domestic Icebreaking Operations Policy, COMDTINST 16151.1 (series), provides policy for waterways managers when icebreaking services beyond a district's normal level of resources are needed. Reference (h) also provides policy for the Ninth District regarding resources when coordinating DOMICE operations with Canada.

B.2.b. Command Briefs – Ice Condition Summaries	Provide briefings to the command staff per local policy. Make the content relevant to current and future DOMICE operations within the AOR.
B.2.c. Battle Rhythm	The operational tempo during the ice season can often be dynamic. Waterways managers maintain a current plot of ice conditions for navigation and SAR response purposes. In addition, daily reports are provided, and the employment of icebreaking facilities within the AOR are scheduled and supervised. Telephone conferences allow for timely exchanges of information among USCG units, providing daily summaries, next-day tasking, etc.
B.2.d. SAR Response Capability	Ice-covered waterways hamper a unit's availability to respond to SAR cases. As ice forms, USCG boats become icebound. Initially, sector station managers coordinate with waterways managers to attempt to deploy smaller icebreaking resources (local, state, and federal agencies) to clear station moorings and maintain access to open water. As ice becomes more substantial, sector station managers coordinate with the SCC to shift station AORs and obtain SAR response with local, state, and federal agencies. Throughout the ice season, waterways managers maintain communications with sector departments and SAR units to obtain and report to district offices the SAR response capability of unit stations.

B.2.d.(1). Public Affairs Coordination

Media coordination efforts create awareness of ongoing DOMICE operations using local stakeholder communication tools to inform both the maritime user community and appropriate government agencies. These efforts solicit responses and encourage participation from the boater, mariner, and maritime professionals.

During the ice season, waterways managers assist USCG public affairs staffs with:

- Scheduling media transits aboard USCG icebreakers.
- Providing relevant photos obtained of ice observed during:
  - Ice reconnaissance missions.
  - Icebreaking services rendered in significant ice conditions.
  - Other DOMICE operations missions.

USCG public affairs staffs assist waterways managers with:

- Responding to inquiries from media outlets and social media.
- Issuing press releases announcing:
  - Changes to status during the ice season.
  - Waterways restrictions and closures.
- Leveraging the news media to disseminate information to the public.

Refer to unit SOP for additional public affairs guidance.

NOTE: **USCG field units receive numerous email and verbal requests for information from congressional staff and members. Field units inform district governmental affairs officers of any congressional inquiry. In some cases, the district governmental affairs officer might also be the district public affairs officer. Public Affairs functions are discussed in reference (n), External Affairs Tactics, Techniques, and Procedures (TTP), CGTTP 1-04.1 (series).**

B.3. External Coordination

Creating and maintaining partnerships within the port community is a key component to successful waterways management. During the ice season, waterways managers contact and maintain communications with partner agencies, stakeholders, and the public for awareness, and to mitigate and deconflict port and waterways ice-related impacts and risks. The following interagency and industry partners might have a stake in the establishment of USCG-imposed access control measures:

- International governments.
- Tribal governments and councils.
- Federal agencies (NOAA, USACE, NIC, USN).
- State agencies (emergency management, natural resources, environment).
- Local municipal governments.
- Local agencies (harbormasters, fire and police departments).
- Port authorities, marine or maritime exchanges, and pilots associations.
- Shipping industry and transportation managers (ferries).
- Facility and terminal operators/managers.
- Vessel owners/managers (American waterways operators) and shipping agents.
- Fisheries (commercial, recreational).
- Recreational boating.
- Environmental organizations and citizen groups.
- Waterfront residents and community/civic associations.
- Media outlets.

B.3.a. Icebreaking

In determining icebreaking priorities, waterways managers consider capabilities and availabilities of OGA and commercial icebreaking assets.

B.3.b. Military

Waterways managers identify and monitor any military significance of a waterway or waterway user.

B.3.c. Environmental

Waterways managers evaluate the scope and seriousness of past and potential waterway closures caused by significant ice conditions. Local emergency managers are valued sources for information concerning exceptional environmental concerns and ice levels.

B.3.d. Commercial

Waterways managers collect and disseminate information from shipping companies to provide accurate estimated time of arrival information to icebreakers. In addition, during the ice season, waterways managers:

- Understand the difficulties encountered by certain waterway users and the possibility of alternative ports and routes.
- Identify the reasons for an increase or decrease in traffic density in a specific region.
- Obtain and communicate historical commerce data for their AOR.
- Recognize waterway risks and potential hazards to navigation.

B.3.e. Outreach

Continue outreach on emergent ice issues. Contact and coordinate with external stakeholders who have a stake in the safe and efficient operation of the port and waterways. Waterways managers use HSCs and local stakeholder input to validate established waterways priorities for facilitation of navigation, per the tiered waterways system. Waterways managers use the USCG Homeport website to publish ice-related information within a specific COTP zone, including supporting documents such as bulletins or notices to mariners (NTM) posted for public viewing.

Tools for communicating:

- Bulletins:
  - Marine safety information broadcast (MSIB).
  - Marine safety and security broadcast.
- NTMs (includes broadcast NTM and local NTM).
- Press releases.

Methods for communicating:

- Homeport.
- Electronic mail (distribution lists).
- Marine band radio.
- Public affairs staff.

B.3.f. Climate Products

NWS provides detailed daily weather statistics, including temperature, precipitation, degree days, wind, humidity, sunrise/sunset, and record temperature data. Precipitation data includes both calendar year and water year totals, percent of normal values, and comparisons to normal. Similarly, where its usage is practical during the ice season. Accumulated freezing degree-days data is available from the USACE CRREL.

B.3.g. Types of Restrictions and Closures

During the ice season, waterways managers might experience waterways restrictions and closures. A waterway restriction limits the normal use of a waterway, whereas, a waterway closure restricts a waterway such that no vessels are able to transit. Reference (h), Domestic Icebreaking Operations Policy, COMDTINST 16151.1 (series) provides the following types of restrictions and closures:

Restriction types:

- COTP. Limiting waterway use to steel-hull vessels or a minimum horsepower.
- Environmental. A vessel becoming beset in ice and hindering the progress of other vessels.

Closure types:

- COTP. A safety zone, regulated navigation area, or other vessel traffic controls.
- Environmental. Extreme ice conditions.

Additionally, annual implementation of certain local or regional USCG DOMICE operations plans establish waterways restrictions on movement of vessels operating in certain ice-covered navigable waters of the U.S. These might include the following actions:

- Restricting tank vessel transits to daylight while in the presence of ice.
- Reducing speeds to an exact limit in specified locations to reduce incidental icebreaking.
- Requiring additional voice and position reporting points throughout the AOR of the operation plan.

Many regions use ice-covered waterways for recreation and transportation purposes. When conditions allow for such uses, the USCG informs interested recreational users and residents via NTM and public affairs sources:

- The current status of channel closures.
- Plan activities carefully and use caution on the ice.
- Keep away from shipping channels.
- Remain aware of the status of waterway closures through local media resources.

B.3.h. Convoy Operations

COTPs might require convoys with vessels proceeding in a particular order to assist the movement of all vessels through a particular waterway or stretch of ice-covered waters. Convoys using icebreakers typically occur when significant ice has largely covered the waterways in the AOR. COTPs also establish ad hoc convoys on an as-needed basis to better use icebreaking resources to assist vessels moving through the ice.

Convoys consist of a group of vessels led by a USCG icebreaking asset on a designated route. They typically have specified directions of transit, rendezvous locations, and times. Waterways managers coordinate convoy operations as prescribed in local policy and/or SOP. Such policy usually stipulates that convoys use VHF-FM marine band radio frequencies for coordination and USCG icebreakers not be scheduled to conduct convoy operations during low visibility and night time. Convoy information is disseminated to interested mariners and the general public via NTM and through local media.

B.3.i. Navigation Assistance Requests

The USCG provides DOMICE assistance in navigable waters of the U.S. where commercial icebreaking resources are unavailable in significant ice conditions. Industry representatives seeking icebreaker support for their vessel movements provide to waterways managers information necessary to determine the need and location for regional icebreaker assignments. These requests might also come from local governments, facility managers, emergency managers, OGAs, and port partners.

A best practice is the "Daily Movement Report," which counts each vessel movement as a navigation assistance request. The report is submitted daily, (or as often as industry representatives seek to move their vessels) by email, facsimile, or telephone, when waterways are covered by ice. A navigation assistance request sheet is in Appendix P: Example Icebreaking Request Sheet.

B.3.j. Icebreaking Service Requests

Requests for icebreaking are typically received by waterways managers, SCC, or VTS via marine band radio, electronic mail, telephone, or fax. Once icebreaking assistance is requested, determine the following:

- Date and time of request.
- Vessel (or facility) identification and type. Hull material/construction, horsepower rating, air draft, etc.
- Cargo type, amount and value.
- Location within a port or waterway.
- Destination.
- Ice conditions on scene.

- Vessel (or facility) point of contact. Maintain liaison with appropriate authorities when mitigating icebreaking service requests.
- Weather forecast. Wind speed/direction, temperature, visibility.
- Service priority. As provided in reference (h), Domestic Icebreaking Operations Policy, COMDTINST 16151.1 (series).
- Icebreaking activity. Consider the capability and availability of icebreaking assets (USCG, OGA, commercial) and appropriate response, if any.
- Date and time of mitigation.

Waterways managers incorporate appropriate risk management procedures at all levels. Per locally promulgated plans, orders, and SOP, execute icebreaking services to be provided in specific waterways. Flood relief operations are discussed further in reference (i), Domestic Icebreaking Tactics, Techniques, and Procedures (TTP), CGTTP 3-91.9 (series).

Reference (h) requires waterways managers to document requests for icebreaking assistance received for the entire icebreaking season and to include these requests in their end of season DOMICE operations report.

When it becomes necessary to send a USCG icebreaker into an area, waterways managers notify interested parties (at least 72 hours) in advance of icebreaker transits. Interested parties include:

- Local news media.
- State departments of conservation.
- Law enforcement agencies.
- Sports clubs.
- Ice fishermen.

B.3.k. Monitoring the Management of Commercial Industry

To assist commercial traffic in the connecting waterways of the U.S., waterways managers not only need to know waterways in their AOR but also the types and amounts of cargo transported on those waterways. For success during a moderate to heavy ice season, work with commercial facility operations officers to determine their needs.

- What waterways contain winter critical infrastructure and berths (e.g., road salt, sand, home heating oils)?
- What effects do delays caused by ice have on cargo types and deliveries?
- What are fishing vessel industry needs?
- What are passenger vessel industry needs, especially to communities without road service?
- How do we best monitor and manage commercial traffic and facilities?

Refer to Appendix Q: MTS Recovery Facility Status Sheet as a means of monitoring.

B.4. Resource Management

Resource management is a vital part of USCG DOMICE operations. Significant ice conditions, narrow channels, shallow waterways, and frequent transits of vessels transporting critical cargo make DOMICE operations particularly challenging. During the ice season, waterways managers execute operational plans that were developed or reviewed before the ice season. These plans often require extensive management of icebreaking resources and coordination with other USCG units, OGA, and other nations. For instance, maintaining a 1,500-mile international border with Canada requires special collaboration to keep shared waterways safe, secure, and clear. As such, USCG icebreakers work with their CCG counterparts to accomplish DOMICE operations.

Key components of DOMICE operations resource management include:

- Readiness: icebreaker scheduling and tasking, including movement among areas.
- Mission progress.
  - Conduct icebreaking assistance to facilitate commerce.
  - Preventative icebreaking.
  - Vessel assistance.
  - Direct assistance.
- Coordination.
  - Liaison with other sectors, districts, and air stations.
  - Logistics needs of participating icebreakers (fuel/food, berthing arrangements, personnel needs, etc.).

B.4.a. Surface Ice Reconnaissance	USCG icebreakers are assigned within the AOR to manage the USCG DOMICE mission where expanded ice growth in commercial ports and waterways typically occurs.
B.4.b. Aerial Ice Reconnaissance	When a dedicated air patrol is desired, notify the appropriate flight operations scheduler. Conduct such notification per local policy. Where available, use the USCG Auxiliary Air Operations Program. When USCG Auxiliary aircraft and aircrews are used to conduct an ice reconnaissance, and a date has been scheduled, confer with pilot prior to the flight to determine: • Status of the aircraft. • Status of the take-off/landing locations (airport operations). • Expected commence and completion times. • Flight paths to be flown. • Experience level of the ice observer. • Times and method of reporting ice conditions observed. • Other items to be reported during flight. • Anticipated stops for food, fuel during flight. • Additional needs of the program manager or instructions to the pilot.
B.4.c. OGAs	OGA icebreaking assets and ice-capable resources provide extensively valuable support to the USCG's overall DOMICE operations mission. Waterways managers confer with state and local program managers daily to determine: • Requests for icebreaking service received. • Status of icebreaking resources. • Icebreaking missions completed. • Ice conditions observed by icebreaking resources.
B.4.d. Industry/ Commercial	Recognize that the USCG is unable to respond to all requests for icebreaking assistance or in all ice conditions. Sometimes commercial icebreaking services are the best option.

B.4.e. Safety	Conduct icebreaking with regard to the possibility of damage to vessels, bridges, and shore facilities. Minimize the effect on riparian communities and mitigate, minimize, or eliminate environmental damage. Moving hazardous substances through ice-covered waters might require additional resources, including government and non-government solutions, to address associated risks.
B.4.f. Night and Low Visibility Operations	Minimize night and low visibility operations. They are high risk and not normally scheduled.
B.5. Tracking Ice Conditions	Monitor ice conditions within the AOR and review ice information disseminated by the SCC.
B.6. Observing and Reporting Ice Conditions	Waterways managers monitor air and water temperatures. Obtain air andwater temperatures to email to sector program manager: 1. Log onto Outlook and retrieve previous DOMICE email, overtype with new date. 2. Obtain air and water temperatures from NOAA and other internet sources. 3. Obtain climate data from NOAA internet sources. 4. Review ice reports from internet sources. 5. Review ice reports received via email. Forward to the SCC, if relevant. 6. Provide any DOMICE operations recommendations.
B.7. Tracking ATON Discrepancies	Track ATON discrepancies to monitor aid availability, ensure corrections are addressed, and damage costs submitted (when requested by district).

B.8. Reporting and Documenting

Submit USCG reports per established SOPs. USCG reports include:

- OPSUMs.
- Activity reports.
- CART reports.
- Abstract of Operations (AOPS) Reports.

Industry groups often submit statistical summaries outlining the product move during a particular season or the lost opportunities associated with a particular DOMICE season. The Lake Carriers' Association posts its annual reports and statistics for the Great Lakes.

B.8.a.(1). Drafting Daily or Weekly OPSUMs

Steps to draft and release an OPSUM message to district:

1. Retrieve previous day's message, overtype new date, and save as a new message.
2. Obtain and review all station air/water temperatures and SAR status data from the SCC. This information can be scanned and emailed, tabulated and emailed, instant messaged, etc. There is no standard for this task. It is up to the situation unit which format to provide.
3. Obtain icebreaker operations, recommendations, and plans from cutters and OGA.
4. Obtain air reconnaissance patrol data/information as necessary.
5. Review icebreaking service requests, pending and completed.
6. Review status of current waterway operations and planned vessel movements.
7. Include any other relevant information related to sector ice operations.

B.8.a.(2). AOPS Reporting

Accurate reporting of resource employment hours are essential to strategic and budget planning at the program level. Additionally, the USCG uses domestic ice operations report data for:

- Evaluating past and present efforts.
- Making cost-benefit determinations.
- Planning future operations.
- Responding to departmental, congressional, and public inquiries.

It is imperative that the employment data entered into AOPS reports accurately reflects the level of effort of assets conducting the DOMICE mission.

Section C: Postseason

C.1. Determining the End of Ice Season

Once the threat of ice forming in your waterways has passed, the task of reestablishing the waterways in your sector begins. This threat is determined by observing temperature monitoring stations and forecasted weather for your area.

C.2. Coordinate Waterway Surveys

Determine the waterways most affected by ice, and the extent of the damage caused by ice, both to ATON and to the waterway itself. This information helps determine the health of the waterway and when it can be opened fully to maritime traffic. Include the following considerations:

- ATON:
  - Fixed aids:
    - Damage to structure.
    - Damage to riprap.
    - Damage to ATON equipment, lights, or day boards.
    - Missing, if missing wreckage can be located. If not, conduct survey around assigned position or last known position to determine if wreckage might be a hazard to navigation.
  - Floating aids:
    - Damage to hull.
    - If missing, was missing hull located or did it sink?
    - If hull is believed to have sunk, conduct survey around assigned position or last known position to determine if hull might be a hazard to navigation.
- Waterway:
  - Existing depth of water.
  - Damage to floating or fixed piers or floats that might be a hazard to navigation.
  - Any floating or fixed wreckage that might have been dragged into the channel by ice floes.

C.2.a. ATON Verifications	Conduct verifications of ATON for each waterway. Verifications can be as simple as sighting that ATON assigned to the waterway appear to be on station and working properly. This can be achieved by: • Station boats with knowledge of the waterway. • Cutters with knowledge of the waterway. • ATON teams with primary or secondary responsibility in the waterway. • ATON tenders with primary or secondary responsibility in the waterway. • USCG or USCG Auxiliary aircraft with ATON technicians embarked. Once a preliminary verification has been completed, and problem areas have been identified, sector managers coordinate among assigned ANTs and cutters to respond to reported ATON discrepancies. ANTs also respond to shoaling or other hazards to navigation in their waterways and issue: • ATON discrepancy message. • NTM. • Safety marine information broadcast. • MSIB. • Publication in the local notice to mariners. Unless a waterway has been closed, commercial and recreational users play a large part in reporting problems to your waterways.
C.2.b. Channel Surveys	Coordinate preliminary channel surveys with OGAs (i.e., USACE, NOAA, state, etc.) to identify problem shoaling or other hazards to navigation in the marked channel. Sectors coordinate with OGAs if shoaling or other hazards to navigation in the marked channel are suspected. Conduct the following actions: • NTM. • Direct sector units to realign waterway ATON to mark best water. • Coordinate with district for district units to assist in clearing/marking hazards. • Consider vessel traffic controls to restrict or close the waterway where severe conditions exist. • Coordinate with OGAs to remove hazards. See reference (o), Waterways Management (WWM): Hazards to Navigation Tactics, Techniques, and Procedures (TTP), CGTTP 3-71.5 (series).

C.3. Re-deploy Seasonal ATON

Re-establish seasonal ATON per the USCG Light List (appropriate volume). Seasonal ATON are managed in four categories as follows:

- ENDN – If ATON might be endangered by ice forming in a waterway, it is removed until the threat of ice damage passes.
- ENDR – If ATON might be endangered by ice forming in a waterway, replace the on-scene hull by a more ice-resistant hull until the threat of ice damage passes.
- SEAN – ATON removed on specified dates in the Light List (might be fixed or floating ATON).
- SEAR – ATON replaced with a hull (usually unlighted or an ice-resistant, lighted hull) on a specified date in the Light List.

When re-establishing seasonal ATON, the primary servicing unit sets aids to mark best water if the waterway has experienced shoaling or other hazards to navigation that did not exist prior to the start of the ice season.

If seasonal ATON is not going to be returned to summer status, Sector issues an NTM stating the condition of the ATON. A summer signal out late or in early equals a better signal, but out early or in late equals a degraded signal.

C.4. Capture Lessons Learned

District hosts a post-ice-season meeting shortly after the official close of the ice season. Sectors gather information relating to their experiences during the season to be discussed, such as:

- Were goals and objectives met?
- Reliability of ice/weather forecasts for planning purposes.
- Was public outreach and media relations effective?
- Icebreaker effectiveness in various ice conditions.
- Best communication practices between USCG and waterway users.
- Cutter and boat casualty response and support.
- Improvements to information collection processes.
- Effectiveness of commercial icebreaking.
- Air support used.

C.4.a. Internal and External Postseason Meetings (Hot-Wash)	Conduct postseason meeting or "hot-wash" soon after the season ends to capture both the good and the bad of the ice season while it is fresh in the minds of customers and service providers (either in person or a phone conference. Conduct de-briefs (USCG and customers) separately, so that there is not any holding back of comments, either positive or negative. • Internal to the USCG: ➢ Assigned breakers. ➢ ATON teams. ➢ Stations. ➢ District. ➢ Air stations. ➢ Other cutters, sectors, SCCs, districts, departments/divisions. ➢ Public affairs. • External to the USCG: ➢ Tugs/tows. ➢ Ships/tankers. ➢ Ferries. ➢ Commercial and recreational vessels. ➢ Facilities serviced by the waterway. ➢ Pilot organizations. ➢ USACE. ➢ NOAA. ➢ NIC. ➢ Emergency managers. ➢ DNR/DEQ. ➢ Police/fire. ➢ Maritime exchanges. ➢ Municipalities. ➢ Tribal.

C.4.b. Customer Feedback	Feedback from waterways users plays a big part in mission prioritization and asset use. Knowing the customers in a waterway and the products moving in and out of ports serviced by those waterways ensures optimal use of icebreaking assets and ensures that emergency icebreaking requests do not surprise sectors. See Appendix R: Example Industry Feedback Letter, to understand more about what is contained in an industry feedback letter.
C.4.c. CART	Make final entries in CART on any unreported information such as port status or waterways previously closed required by district. Close out any events opened by sector and no longer current. Generate the final executive summary report.
C.5. Homeport Waterways Status	Ensure the homeport status is current and reflects conditions of each waterway or port reported.
C.6. MISLE Case Review	Review and close any activities related to the ice season.
C.7. Identify/ Report Issues from ATON Discrepancy Response, Reporting Damage/Loss	As each sector manages ATON in its AOR, it is important that the sector track each discrepancy caused by ice as it occurs and reports it correctly. Prior to the ice season closing, each sector determines the status of open discrepancies and reports anticipated correction dates and effects on the waterway if not corrected. • Sector reports to district on ice damage to ATON and losses incurred during the season. • District reports to area any losses incurred to ATON due to ice damage during the season.
C.8. End of Season Report	Per reference (h), Domestic Icebreaking Operations Policy, COMDTINST 16151.1 (series), and district SOPs, districts compile information from weekly reports made by sectors for the end of season report. Key elements of the end of season report include: • Winter assessment. • Icebreaking data. • Opportunities for improvement. • Best practices.

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Appendix A: Glossary and Acronyms

AIS	Automatic Identification System.
ANT	Aids to navigation team.
AOPS	Abstract of Operations
AOR	Area of responsibility.
ATON	Aids to navigation.
BNM	Broadcast notice to mariners.
Brash Ice	Conglomerations of small ice cakes and chunks that have been broken off from other ice formations. These conglomerations coalesce and refreeze into irregularly shaped masses, 1 foot to 6 feet in diameter, usually with sharp projections. Brash ice can extend all the way to the bottom of an ice-congested waterway.
C2OIX	Command and Control Office Information Exchange.
Cake	Detached segments of ice sheets. The following shows the recognized categories of cakes/floe measurement: • Cake – Less than 20 meters (22 yards) across. • Small floe – 20-100 meters (22-109 yards) across. • Medium floe –100-500 meters (109-545 yards) across. • Big floe – 500-2,000 meters (545 yards-1.1 nautical miles) across. • Vast floe – 2-10 kilometers (1.1-5.5 nautical miles) across. • Giant floe – More than 10 kilometers (5.5 nautical miles) across.
CART	Common Assessment and Reporting Tool.
CBP	U.S. Customs and Border Protection.

CCG	Canadian Coast Guard.
CCGS	Canadian Coast Guard ship.
CFR	Code of Federal Regulations.
CGTTP	Coast Guard tactics, techniques, and procedures.
CIS	Canadian Ice Service.
CO	Commanding officer.
COTP	Captain of the port.
Coverage	A ratio of water surface covered by ice to the total surface area at a specific location or over a defined area.
Crack	An opening in the ice sheet or floe that is not navigable by a ship. A good rule of thumb is if you can jump across it, it is a crack. If you cannot, it is a lead. See ***Lead***.
CRREL	Cold Regions Research and Engineering Laboratory.
DEQ	Department of Environmental Quality.
DNR	Department of Natural Resources.
DOE	Department of Energy.
Domestic Icebreaking	Operations to clear ice-covered navigable waterways in U.S. territorial waters and, by agreement, in Canadian waters on the Great Lakes. This distinguishes these operations from polar icebreaking operations.
Domestic Icebreaking Service Request	Any specific request for icebreaking services from a vessel master, owner, operator, agency, or community to the USCG.
DOMICE	Domestic icebreaking.
Drift Ice	Any unattached ice formation or any area of ice other than fast ice.

EEI	Essential elements of information.
ENDN	ATON-in-danger category. Indicates that when the ATON is endangered by ice, it is removed until the threat of ice damage passes.
ENDR	ATON-in-danger category. Indicates that when the ATON is endangered by ice forming in a waterway, it is replaced with a more ice-resistant hull until the threat of ice damage passes.
Fast Ice	Immobilized ice formations. Ice so firmly frozen into place (along the shore or held by islands) that winds and water currents cannot dislodge the formation.
Floe	Detached segment of floating ice sheets. See ***Cakes***.
FRAGPAG	Fragmented public affairs guidance.
Frazil	Fine speckles or ice crystals that float freely and individually in the water.
Frost Smoke	Fog-like clouds formed by the contact of cold air with relatively warm water.
HSC	Harbor safety committee.
IAP	Incident action plan.
Ice Concentration	Ice concentrations are reported to the nearest 10 percent. • Open water: 10 percent. • Very open pack: 20-30 percent. • Open pack: 40-50 percent. • Close pack: 60-70 percent. • Very close pack: 80-90 percent. • Consolidated pack ice, compact: 100 percent.
Ice Edge	The boundary, at any given time, between the open sea or lake and ice of any kind, whether drifting or fast.
Ice Jam	An accumulation of broken ice caught in a channel or river that restricts water flow.

Ice Thickness	Ice thickness is reported in inches, such as 0.5-1 inch, 4 inches, 8-10 inches, etc.
Lake Ice	Ice formed on a lake, regardless of observed location. Nearly all ice on lakes can be classified as either “blue” or “white.” Blue ice consists of closely packed water crystals with relatively few impurities. White ice incorporates large quantities of air.
Lead	Any opening or passageway through sea ice that is navigable by a ship. • Blind lead – a lead blocked at one end (dead end). • Shore lead – a lead between the pack ice and the shore. • Flaw lead – a lead between pack ice and fast ice.
Light List	Light List is a detailed list of navigational aids in geographic order from north to south along the Atlantic coast, from east to west along the Gulf coast, and from south to north along the Pacific coast. It lists seacoast aids first, followed by entrance and harbor aids listed from seaward. Intracoastal Waterway aids are in geographic order in the direction from New Jersey to Florida to the border of Texas and Mexico.
MCTS	Marine Communications and Traffic Services.
MISLE	Marine Information for Safety and Law Enforcement.
MOA	Memorandum of agreement.
MOU	Memorandum of understanding.
MSIB	Marine safety information broadcast.
MSU	Marine safety unit.
MTS	Marine Transportation System.
MTSRU	Marine Transportation System Recovery Unit.
NAIS	North American Ice Service.

Navigable waters of the US	Per reference (p), Navigable waters of the United States, navigable waters, and territorial waters, 33 CFR 2.36: (a) Except as provided in paragraph (b) of this section, *navigable waters of the U.S.*, *navigable waters*, and *territorial waters* mean, except where Congress has designated them not to be navigable waters of the U.S.: (1) Territorial seas of the U.S.; (2) Internal waters of the U.S. that are subject to tidal influence; and (3) Internal waters of the U.S. not subject to tidal influence that: (i) Are or have been used, or are or have been susceptible for use, by themselves or in connection with other waters, as highways for substantial interstate or foreign commerce, notwithstanding natural or man-made obstructions that require portage, or (ii) A governmental or non-governmental body, having expertise in waterway improvement, determines to be capable of improvement at a reasonable cost (a favorable balance between cost and need) to provide, by themselves or in connection with other waters, as highways for substantial interstate or foreign commerce. (b) *Navigable waters of the U.S.* and *navigable waters*, as used in sections 311 and 312 of the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1321 and 1322, mean: (1) Navigable waters of the U.S. as defined in paragraph (a) of this section and all waters within the U.S. tributary thereto; and (2) Other waters over which the Federal Government may exercise Constitutional authority.
New Ice	A general term for recently formed ice composed of ice crystals weakly frozen together (if at all), which has a definite form while afloat.
NIC	National Ice Center.
NOAA	National Oceanic and Atmospheric Administration.
NTM	Notice to mariners.
NWS	National Weather Service.
OGA	Other government agency.

OIC	Officer in charge.
OPORD	Operational order.
OPSUM	Operational summary report.
Pack Ice	Pack ice is a term used in a wide sense to indicate any accumulation of sea ice, other than fast ice, no matter what form it takes or how it is dispersed.
PAG	Public affairs guidance.
Pancake Ice	Predominantly circular pieces of ice. Pieces are 1 foot to 8 feet across with raised rims resulting from the pieces striking against one another.
Plate Ice	Flat ice with approximately uniform thickness and without ridges/windrows.
Pressure Ridge	A line or wall of broken ice forced upward and downward by pressure, usually formed when two floes collide with each other. See ***Windrow***.
Preventative Icebreaking	Icebreaking activities for general track maintenance, track grooming, and flushing operations to support unspecified commercial vessel movements.
PRS	Port recovery specialist.
PWCS	Ports, waterways, and coastal security.
Rafted Ice	A type of ice formed by one floe overriding another. Some parts of the overlap trap water that freezes and cements the two floes together. Other parts trap air and take on the characteristic white appearance.
RFF	Request for forces.
River Ice	Ice formed in or carried by a river, regardless of observed location.
ROC	Regional Operations Center.
Rotten Ice	Ice that has become honeycombed because of melting and is in an advanced state of disintegration. Rotten ice appears transparent (dark) when saturated with water.

Rubble	Coarse broken plate and brash ice that has accumulated over a large area due to strong winds.
SAR	Search and rescue.
SCC	Sector command center.
Sea Ice	Any form of ice found at sea that originated from the freezing of seawater.
SEAN	ATON-in-danger category. Fixed or floating ATON removed on dates specified in the Light List.
SEAR	ATON-in-danger category. ATON replaced with a hull (usually unlighted or an ice-resistant lighted hull) on a date specified in the Light List.
Shore Ice	A basic form of fast ice that is attached to the shore or grounded in shallow water.
SITREP	Situation report.
SLSDC	St. Lawrence Seaway Development Corporation.
SLSMC	St. Lawrence Seaway Management Corporation.
SMIB	Safety marine information broadcast.
SOP	Standard operating procedure.
Transit	A commercial vessel movement through a specific waterway, regardless of whether assistance is rendered.
TTP	Tactics, techniques, and procedures.
U.S.C.	U.S. Code.
Urgent Response	Assistance to vessels in situations that do not rise to the level of a search and rescue (SAR) case but, if left unassisted, have a high probability of deteriorating into a hazardous situation.
USACE	U.S. Army Corps of Engineers.

USBP	U. S. Border Patrol.
USCG	U.S. Coast Guard.
USGS	U.S. Geological Survey.
USN	U.S. Navy.
Vessel Assistance	Icebreaking activity to assist the movement of commercial vessel traffic. An icebreaker's track work in anticipation of vessel movement within 24 hours of the effort, along with the transit time to a beset vessel or a specified vessel requiring assistance, are operational hours categorized as vessel assistance.
VTS	Vessel traffic service.
Waterway Closure	An event or condition preventing vessels from transiting a waterway due to: • A COTP safety zone, regulated navigation area or other vessel traffic controls. • An environmentally imposed closure without USCG actions, including extreme ice conditions.
Waterway Restriction	An event or condition limiting normal use of a waterway. A restriction might be imposed on a waterway by: • A COTP-issued provision placing specific limitations on vessels or waterway in an otherwise open waterway. Examples include limiting waterway use to steel-hull vessels, minimum horsepower restrictions, or a maximum draft. • An environmentally imposed limitation without USCG actions. For example, a vessel becoming beset in ice and hindering the progress of other vessels. If a waterway is restricted such that no vessels are able to transit, consider it a waterway closure.
Windrow	Rows of ice piles formed by drifting masses of floes and cakes being pushed against the shore or against fast ice by the wind. Windrows continue to grow as long as the wind persists. See ***Pressure Ridge***.
WWM	Waterways management.

Appendix B:
Example Outreach Letter

Basic Marine, Inc.
Attn: Mr. Dan Kobasic
440 North 10th Street
Escanaba, Michigan 49829

Mr. Kobasic:

For the upcoming domestic ice season, the U.S. and Canadian Coast Guards will dispatch icebreaking resources for the entire Great Lakes from three locations; namely, the Vessel Traffic Service (VTS) at Sault Sainte Marie, Sector Detroit, and the Regional Operations Center (ROC) at Montreal, Quebec.

VTS St. Mary's River, under the direction of Sector Sault Sainte Marie, will be responsible for the conduct of icebreaking operations on Lake Superior, Lake Michigan, the St. Mary's River, the Straits of Mackinac, and the waters of Lake Huron north of Alpena, MI. In the past, you provided commercial icebreaking services for Green Bay and other Lake Michigan waterways. If you intend to do so this winter, I invite you to contact the VTS at 906-635-3232 to declare your availability or report the same via email at sootfc@uscg.mil.

The Coast Guard's policy regarding commercial icebreaking resources has not changed and is enclosed with this letter. The Commercial Assistance Policy was enacted in 2009 with a goal of increasing service predictability and waterway reliability. Your support, feedback, and participation in the program is encouraged and appreciated. Please remember Sector Lake Michigan no longer has an active role in managing icebreaking operations. Sector Lake Michigan will, however, continue to perform their traditional duties of search and rescue, law enforcement, environmental protection, maritime safety and security.

If additional information is needed, please do not hesitate to contact me.

Sincerely,

M. S. GILL
Director, VTS St. Mary's River
By direction

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Appendix C:
Example Convoy and Vessel Queuing Procedures

Background: The 2013-14 Great Lakes domestic icebreaking season presented unique challenges to U.S. and Canadian icebreakers, tactical decision makers, and maritime industry stakeholders alike. Severe ice conditions occasionally required tier 1 or 2 waterways to be closed (waterway restriction lasting more than 24 hrs). When this occurs, commercial shipping traffic immediately begins to stack up. As this scenario develops, tactical decision makers quickly devise a plan to stage arriving vessels safely while the waterway is assessed and a strategy to resolve the obstruction is developed. If the closure is expected to be short-term (24-48 hours), vessels are permitted to continue traveling towards the obstructed waterway and anchor in close proximity while the waterway obstruction is resolved.

Traditionally "first to arrive, first to move" applies in this circumstance and a procession order is established accordingly. If the waterway closure requires traffic to be rerouted or moved through the obstructed waterway in sequential steps, perhaps under escort, a plan for queuing vessels is recommended. Using lessons learned from the extraordinary traffic management events of 2014, we captured the process for managing vessels in a queue and structuring convoys. We then stipulated procedures that were vetted through industry for future reference. The following vessel queue and convoy framework is for whenever a waterway closure requires employment of extraordinary traffic management procedures.

I. Definitions: For the purposes of this document, vessel queuing and vessel convoys are distinctly defined below to minimize confusion of the two vessel management processes.

(a) Vessel Queuing: A controlled list of vessels waiting to move through a closed waterway. Guidelines for vessel queuing are important to successful anchorage management, vessel safety, and management of expectations for future movements while the waterway remains obstructed. Procedures for vessel queues are normally developed by tactical commanders with input provided by the commercial shipping industry.

(b) Vessel Convoys: An organized group of ships moving under escort through a waterway obstructed by ice. Convoy size and procession order is determined by the icebreaker leading the movement with input provided by the tactical commander, and feedback from the ships in the convoy. Before each convoy movement, consider ice thickness, wind, vessel horsepower, and each vessel's past performance in ice. These factors help set the order of movement and the convoy's eventual speed of advance. The tactical commander and the icebreaking vessel leading the convoy normally set parameters for establishing the order of movement in a convoy.

II. Standard Procedures for Vessel Queuing: Several contingencies, for vessels waiting to move in an established vessel queue, were developed during the 2013-2014 domestic icebreaking season with input provided by Great Lakes commercial carriers and other maritime industry stakeholders. Experience shows that many regional waterways cannot support logistical needs of waiting ships and have inadequate space to anchor more than 10 or 12 vessels safely. Due to forecasted long wait times, vessels were allowed to trade outside of the obstructed area provided they reached the designated starting position when called to move. These queuing and positioning guidelines minimized vessel exposure to shifting ice caused by rotating winds, avoided associated risks of groundings at the obstructed waterway, and enabled industry to manage logistics (i.e., fuel, food, potable water, and crew change or pilot availability) better for vessels waiting in the queue. Traffic management processes employed in 2014 reduced unnecessary transit delays as vessels eventually travelled through the obstructed waterway. Foreign-flagged vessels requiring a pilot entered the queue regardless of their physical location, provided they reached the designated starting point when called to move. This ensured that these vessels received equal access to the vessel movement queue.

(a) Queuing Criteria: When building a vessel queue, the following criteria and procedures are generally considered standard practice:

- A ship or company requests (phone, fax, email) a position in the queue. If a procession order is already established (i.e., the lineup of vessels behind a beset vessel or other waterway restriction), the queue begins and subsequent vessels follow those vessels already in the procession order.
- Follow-on vessels are added to the movement queue in the order requests are received. Submitting a daily movement report does not constitute a request to join a vessel queue. Presenting a specific request to join the queue gets the vessel added to the queue list.
- Vessels choose whether to remain in, or conduct trade out of, areas or ports while waiting for their scheduled movement. When doing so, these vessels must arrive at designated starting positions, ready to proceed with the convoy, within the published time frame for movement. The time frame for movement is developed with industry prior to establishing the queuing process.
- If a vessel is out of position or unable to meet a scheduled movement, the next vessel in line moves up in the queue and the missing vessel goes to the end of the next queue.
- A variety of factors might affect a vessel's ability to meet a queued convoy movement. To avoid unduly penalizing vessel companies for these uncontrollable delays, consider the following factors and associated actions. Socialize them with industry, and put one or all of these contingencies into action. A queuing decision matrix provided at the end of this section graphically depict the following factors.
    - Reportable marine casualty – If Vessel A is called to move in its assigned position in the queue, but is unable to proceed due to a reportable marine casualty, the managing company is permitted to substitute another vessel (Vessel B) provided that Vessel B is in place ready to move with the queued convoy movement. Once repaired, Vessel A takes Vessel B's position on the queue list. If no substitution is made, Vessel A joins the next queued movement.

- Ice/weather delay –Vessel A is trading in another region or is outside the obstructed area when called to move into its assigned position in the queue, but ice or extreme weather stops it from reaching the designated starting location in time, the next vessel on the queue list moves up to take Vessel A's position in the queue. Once Vessel A reaches the starting position, it falls into the next queued convoy movement.
- Logistics – If Vessel A is called to move in its assigned position in the queue but is unable to move due to a logistics need (i.e., fuel, crew shortage, pilot availability, etc.), the next vessel on the queue list moves up to take Vessel A's position in the queue. Vessel A joins the next queued convoy movement once the logistics issue is resolved.
- Trading outside the area – If Vessel A is trading outside the obstructed area and is called to move in its assigned position in the queue, but for any reason is unable to reach the designated starting location in time, the next vessel on the queue list moves up to take Vessel A's position in the queue. Vessel A goes to the end of the vessel queue list.
- Vessel re-ordered to end of queue – If Vessel A or its managing company are found by tactical decision makers to be using the system to unfairly gain a competitive advantage, the next vessel in the queue list moves up to take Vessel A's position in the queue and Vessel A goes to the end of the vessel queue.

(b) Communications: The key to effective traffic management, regardless of circumstance, is early and frequent outreach. Communications among tactical decision makers and cutters, and the commercial ships and companies, are each uniquely challenging but essential to mission success. Understandably, all shipping industry stakeholders seek uniform applicability and predictability when it comes to vessel traffic management decisions. If movement delays are expected, early disclosure of the plan for traffic routing, convoy movement, and vessel queuing are considered best practices. Before building a queuing system for long-term waterway obstructions, solicit input from commercial industry as soon as possible. When soliciting industry input, decision makers seek to identify cargo priorities, limitations on vessels operating in ice (industry-imposed speed restrictions or daylight only movements) and industry's desire to side step the standard "first to arrive, first to move" practice for vessel procession and consider the aforementioned queuing criteria. When possible, get feedback from carriers (i.e., Lake Carriers' Association & Canadian Ship Owners Association), Great Lakes Pilots, and foreign-flagged vessel interests (i.e., Shipping Federation of Canada) to provide diverse points of view.

(c) Building the Queue: As a vessel is assigned a position in the queue; a date and time stamp (DDTTTTR MMM YY) is logged, along with the vessel's location, status (i.e., trading, lay to, or fueling), and future plans. Post the agreed upon queue system and associated vessel queue list daily to the USCG Homeport.

(d) Execution: The tactical commander overseeing domestic icebreaking for the obstructed area determines who is best positioned to build and manage the vessel queue. (i.e., ROC Montreal, USCG SEC Detroit, USCG SEC Sault Sainte Marie, MCTS Sarnia)

(e) Collecting Feedback: Frequent communications between tactical decision makers and shipping industry officials opens a path for process improvement. Be apprehensive about changing a queuing system once it is established. Collective agreement among waterway users is the key to the successful acceptance and implementation of minor procedural adjustments to a vessel queuing process.

(f) Demobilization: Once the waterway obstruction is removed, tactical decision makers socialize an end to the vessel queue list with shipping industry officials to achieve an orderly return to normal vessel movement.

III. Standard Procedures for building vessel convoys: At the shipping companies' requests, tactical commanders provide the rationale used to determine convoy size and procession order.

(a) Convoy Criteria and Employment: Performance calculated by horse power to length ratio (hp/L) for each vessel in a convoy, with due consideration of bow shape and beam, works well as the initial criteria used in determining the best lead vessel. When applicable, kilowatts to meters is also examined. When considering the order of movement in a convoy, a 6 to 1 hp/L ratio is historically used to determine a vessel's capability to effectively transit areas where ice thickness exceeds 12 inches. Horsepower to length ratio is then analyzed with experiences lining up convoys, taking into account a vessel's loaded or ballast condition, beam, and in some cases the experience and tenacity of the vessel operator.

Hp/L ratio is not the sole factor to consider but is weighed with other factors when convoy reordering becomes necessary. Consider the following when determining vessels' relative positions in the convoy.

- Vessel characteristics and dimensions – in terms of length, beam, depth, and draft.
- Available and rated horsepower – take into account any maintenance that occurred during lay-up.
- Loaded condition - loaded = momentum, in ballast, propeller and rudder immersion = efficiency.
- Bow/stern shape – in terms of blunt, round, flat, flared, raked, spoon, bulbous, square cruiser, transom, elliptical etc.
- Hull configuration - integrated tug barge, articulated tug barge, thousand footer, ABS ice-class rating, etc.
- Vessel's historical performance in ice
- Crew – experience, fatigue, etc.
- Ice type – plate, brash, windrowed, fast, etc.
- Weather – cross-track winds, visibility, etc.
- Commercial asset assistance

(b) Communications: When vessels arrive to an area where an icebreaker escort is needed, the assigned icebreaker establishes radio contact with the vessel to be escorted to document the time of arrival. The vessel then receives an anchorage assignment or an area to wait in the ice and the name of the vessel they are to follow if joining a convoy. It may be appropriate for the icebreaking resource to share other information at the point of initial contact, such as separation distance to maintain, traffic routing instructions, pertinent notice to mariners, waterway restrictions, and the time to begin movement. The icebreaker keeps informed about traffic progress and any movement difficulties to prevent vessels from stopping in areas with insufficient room to provide assistance. When a vessel is to left out of a particular convoy movement for lack of horsepower or hull configuration (i.e., ATB/ITB or tug with barge on a wire), the icebreaker leading the convoy communicates the rationale to the vessel operator and tactical command follows up with the vessel's operating manager. Each provides an expected time frame, or condition, for future movement. At this juncture, discuss means to improve opportunities for movement such as improving weather, diminishing ice conditions, or an assist tug.

(c) Traffic Management: There are any number of combinations of vessel horsepower, length, beam, and loaded condition. Each of these factors has an impact on a vessel's efficiency operating in the ice. Convoys are generally arranged to assure passage of all vessels, placing less capable vessels behind more capable vessels in descending order. In cases where the disparity in capability is extreme, i.e. three ships, two loaded, one with hp/L 13 to 1, one with hp/L 12 to 1, and an unloaded vessel with hp/L 7 to 1, it is better to put the 7 to 1 vessel last.

(d) Collecting Feedback: Frequent communications between icebreaker commanding officers, tactical decision makers, and vessel masters is important. Safety and efficiency of convoy movements demands all parties be appraised of vessel movement problems.

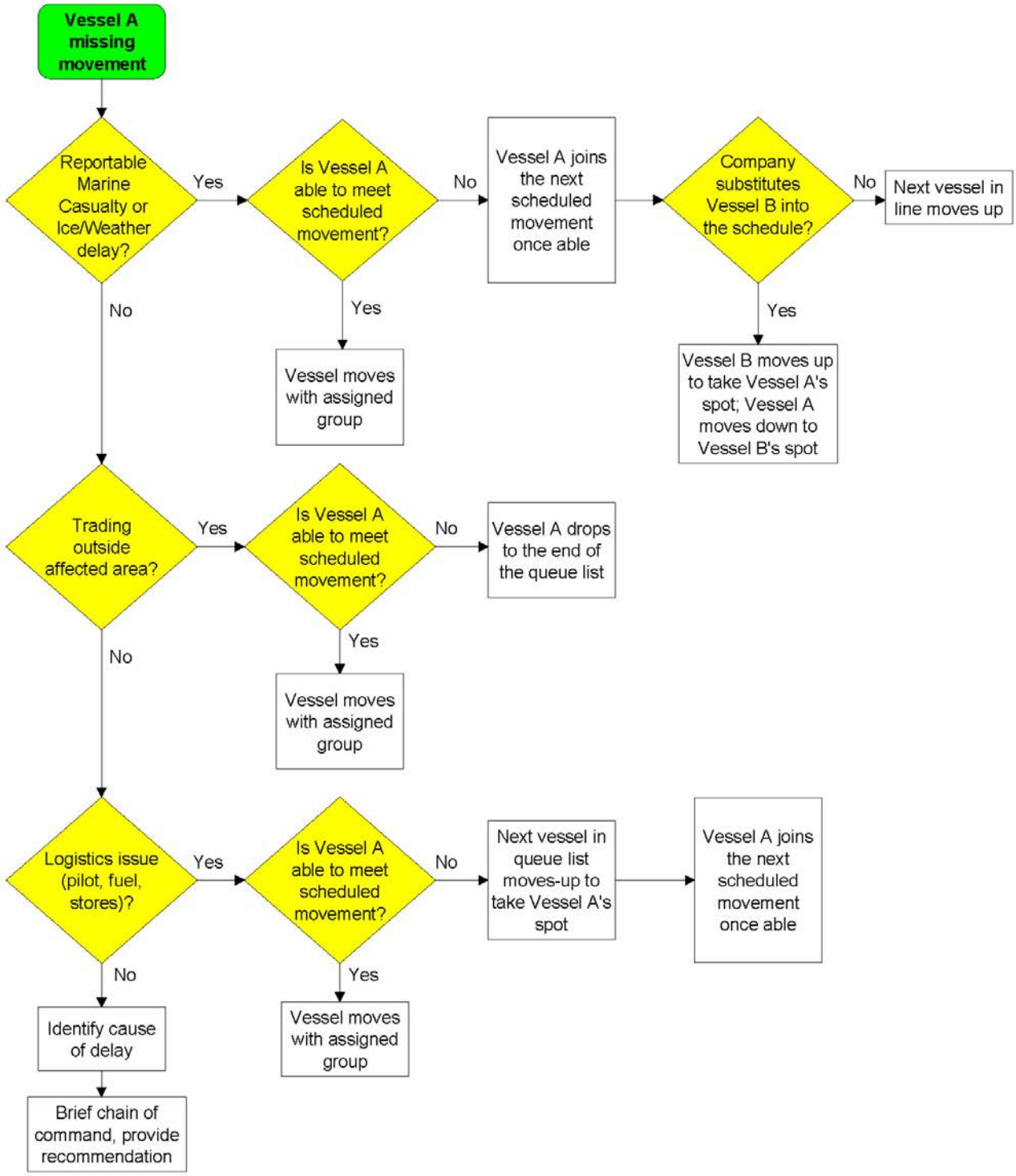
(e) Demobilization: Similar to the return to normal vessel procession order, outreach is the key to standing down vessel convoys when conditions no longer dictate their use.

17.	ALGOMA HANSA	CAN	DETROIT/WINDSOR	NORTH	CORRUNNA, ON	BALLAST	01/23/15 - 1530	01/28/15 - 1645	7275	121.25	VESSEL QUEUE TEMPORARILY SUSPENDED
18.	ALGOMARINE	CAN	LHC/SARNIA/PH	SOUTH	1- ROUGE, MI / 2- CHICAGO IL	SALT	01/23/15 - 1530	01/23/15 - 2245	435	7.25	VESSEL QUEUE TEMPORARILY SUSPENDED / CHANGED DESTINATION FROM ROUGE TO CHICAGO
57.	ALGOCANADA	CAN	LHC/SARNIA/PH	SOUTH	NANTICOKE, ON	GAS/DIESEL	01/24/15 - 1223	01/27/15 - 2000	4777	79.61666667	VESSEL QUEUE TEMPORARILY SUSPENDED
19.	CAPTAIN HENRY JACKMAN	CAN	DETROIT/WINDSOR	NORTH	CHICAGO, IL	SALT	01/25/15 - 0805	01/27/15 - 0630	2785	46.41666667	VESSEL QUEUE TEMPORARILY SUSPENDED
20.	JOHN B. AIRD	CAN	DETROIT/WINDSOR	NORTH	GODERICH, ON	BALLAST	01/25/15 - 1000	01/28/15 - 1645	4725	78.75	VESSEL QUEUE TEMPORARILY SUSPENDED
21.	RT HON PAUL J. MARTIN	CAN	LHC/SARNIA/PH	SOUTH	ERIE, PA	BALLAST	01/25/15 - 2157	01/28/15 - 0900	4263	71.05	VESSEL QUEUE TEMPORARILY SUSPENDED
22.	MANITOWOC	U.S.	LHC/SARNIA/PH	SOUTH	TOLEDO, OH	TACONITE	01/27/15 - 1800	01/28/15 - 0915	915	15.25	
23.	VICTORIOUS	CAN	DETROIT/WINDSOR	NORTH	SARNIA, ON	BALL	01/28/15 - 1200	01/30/15 - 1530	3090	51.5	

ADDITIONAL COMMENTS	
TRANSITING NORTH-BOUND	
VESSEL QUEUE WAS TEMPORARILY SUSPENDED FROM 1/23/15 – 1100 TO 1/27/15 - 0600	

Figure C-1, Vessel queue

Vessel Queueing Decision Process



Appendix D:
Example Commercial Assistance Plan

The Coast Guard seeks to maximize overall maritime mobility when ice impedes vessel movements on the Great Lakes. In many circumstances, commercial providers can contribute toward achieving this goal.

Tier One Waterways – During the extended season and spring break-out, the Coast Guard may break ice in Tier One waterways regardless of the availability of commercial icebreaking providers. This ensures the training and readiness of our current and future crews, and fulfills the good faith and long-standing international agreement regarding icebreaking cooperation on the Great Lakes that exists between the United States and Canada.

Tier Two and Three Waterways – During the extended season and spring break out, the Coast Guard will only provide direct assistance or vessel assistance in Tier Two and Three waterways where there is no commercial icebreaking provider available. However, the Coast Guard may conduct the initial breakout and/or track establishment, if the need exists, then leave all subsequent icebreaking to available commercial providers. This assistance will not be rendered in Tier Three waterways when commercial icebreaking services are available. In waterways where no commercial providers are available, then the Coast Guard may assist as resources become available. The Coast Guard reserves the right to escort vessels from a Tier Two into a Tier Three waterway to facilitate the safe turnover of the escort to a commercial provider. Icebreaker CO's shall carefully evaluate the on-scene conditions and in consultation with the escorted vessel, commercial provider, and Tactical Commander determine where and when it is safe to conduct the hand-off of the escort. Nothing in this policy should be interpreted to require the termination or hand-off of a vessel escort in a high risk situation.

Closed Season –increased risk and navigation difficulty during the closed navigation season is well-documented. Therefore, it is reasonable to expect shipping to provide vessels during this operational period that are capable of handling the ice conditions and to provide sufficient advanced notification to allow for planning and to minimize the impact of operating ice breakers in the severe conditions that often occur during this period. During the closed navigation season, tracks through the ice are not normally maintained, except in limited circumstances as determined appropriate by the tactical commander. Excessive track maintenance during the "closed navigation season" is counterproductive as it encourages ice growth. Therefore, tracks will only be established or freshened in advance of known vessel traffic. During the closed navigation season, the Coast Guard's response to requests for direct assistance will be analyzed on a case-by-case basis. If abnormal ice conditions produce a request for direct assistance, the Coast Guard will provide such resources as available and deemed appropriate. If no unusual conditions are present, but the vessel is incapable of handling its own transit, it will first be referred to commercial icebreaking providers, regardless of the waterway designation. When commercial resources are unavailable, underpowered vessels may be directed not to sail until it is safe to do so. Regardless of the season, the Coast Guard always reserves the right to respond first or as an additional resource to commercial icebreaking providers when the situation is viewed by the Coast Guard to be hazardous and warrants quick and/or concerted action.

Availability – The availability time standard for commercial assistance is defined as their willingness to respond and their capability to be on scene in less time than the nearest available government icebreaker. The criteria to determine cutter arrival time, in other than Tier One waterways, is the nearest available cutter's readiness status plus the transit time (i.e., icebreaking assistance is needed at Rock Island Passage; the nearest cutter is moored in a B12 status at St. Ignace. Availability equals the cutter's recall of 12 hours plus the six-hour transit time to Rock Island Passage, in this case 18 hours). If an available commercial icebreaking provider will meet the vessel in need of assistance at Rock Island Passage in the same period of time (18 hours) or less, then the commercial provider should be used. The point demonstrates the Coast Guard's interests rest with facilitating traffic movement. The icebreaking resource that can reach the scene soonest should be used.

Impasses – In situations when a shipper and commercial provider are unable to reach agreement on assisting a ship, the shipper should contact either Sector Sault Sainte Marie or ROC Sarnia and request icebreaking assistance. The Tactical Commander is delegated authority to evaluate the impasse and determine if and when government icebreaking assistance will be available to respond to the request for assistance.

Procedure – Tactical Commanders are delegated the authority to determine the availability of commercial icebreaking assistance in their areas of responsibility. Tactical Commanders receiving requests for Coast Guard icebreaking assistance when local commercial facilities are available shall refer the requesting party to the commercial provider.

Standard Script: "A commercial icebreaking resource may be available in your location. If icebreaking assistance is required, please contact_____via telephone_or the icebreaker _____via VHF channel____. Please notify Coast Guard Sector Sault Ste Marie when arrangements have been made."

Impasse Script: "I understand that you are choosing not to use commercial assistance. The Coast Guard has determined that your situation is of a non-urgent nature. Commercial assistance is available. Therefore, the Coast Guard will not assist at this time. However, based on current conditions and demand for our services an icebreaker may be directed to respond to your request in approximately____hours. Please advise us if your situation deteriorates or other changes are noted."

Tactical Commanders shall endeavor to keep themselves apprised of the availability of commercial ice breaking providers. Coast Guard personnel **shall not** request commercial icebreaking services for vessels in need of assistance, except in those unusual instances in which vessel masters are unable to contact their agent and have specifically requested that the Coast Guard contact a commercial resource for them. Calls to commercial companies, to confirm the availability of their icebreaking resources, are appropriate and encouraged.

Appendix E:
Example Broadcast Notice to Mariners

```
P R 141331Z JAN 16
FM COMCOGARD SECTOR SAULT STE MARIE MI
TO CCGDNINE CLEVELAND OH
INFO USCGC MACKINAW
USCGC HOLLYHOCK
USCGC ALDER
USCGC KATMAI BAY
USCGC MOBILE BAY
USCGC BRISTOL BAY
USCGC NEAH BAY
USCGC BISCAYNE BAY
USCGC BUCKTHORN
COGARD AIRSTA TRAVERSE CITY MI
COMCOGARD SECTOR BUFFALO NY
COMCOGARD SECTOR DETROIT MI
COMCOGARD SECTOR LAKE MICHIGAN WI
COGARD STA SAULT STE MARIE MI
COGARD STA ST IGNACE MI
COGARD STA MARQUETTE MI
COGARD STA PORTAGE HANCOCK MI
COGARD STA BAYFIELD WI
COGARD STA DULUTH MN
COGARD STA GREEN BAY WI
COGARD STA STURGEON BAY WI
COGARD STA TWO RIVERS WI
COGARD STA SHEBOYGAN WI
COGARD STA MILWAUKEE WI
COGARD STA KENOSHA WI
COGARD STA WILMETTE HARBOR IL
COGARD STA CALUMET HARBOR IL
COGARD STA CHARLEVOIX MI
COGARD STA ALPENA MI
COGARD MSU DULUTH MN
NGA NAVSAFETY WASHINGTON DC
COMDT COGARD WASHINGTON DC
REGIONAL MANAGER SHIP SAFETY SARNIA
BT
UNCLAS
PASS TO OFFICE CODES:
TO CCGDNINE CLEVELAND OH//CC/DPW//
INFO COMDT COGARD WASHINGTON DC//CG-5PW/CG-NAV//
```

SUBJECT: BROADCAST NOTICE TO MARINERS S-007-16 SAFETY BROADCAST PLUS SKED BCST UNTIL CANCELED
QUOTE: UNITED STATES COAST GUARD SECTOR SAULT STE MARIE NOTICE TO MARINERS
S-007-16 LAKE SUPERIOR, ST MARYS RIVER, STRAITS OF MACKINAC AND LAKE MICHIGAN 1. COMMANDER COAST GUARD SECTOR SAULT STE MARIE COMMENCED OPERATION TACONITE.
A. AT THE START OF EACH VOYAGE OR TRANSIT, TO ENHANCE THE COORDINATION OF ICE-BREAKING RESOURCES, COTP SAULT STE MARIE DIRECTS ALL SHIPPING COMPANIES TO PROVIDE AN ESTIMATED TIME OF ARRIVAL FOR THEIR VESSELS DOWNBOUND TO WHITEFISH POINT, UPBOUND TO DETOUR REEF LT, EASTBOUND TO LANSING SHOAL LT, WESTBOUND TO ROUND ISLAND, OR ARRIVING OR DEPARTING FROM ANY OF THE WESTERN SUPERIOR PORTS AND TERMINALS.
B. SIMILARLY, FOR VESSELS OPERATING IN LAKE MICHIGAN IN THE PRESENCE OF ICE, ALL SHIPPING COMPANIES SHOULD PROVIDE AN ESTIMATED TIME OF ARRIVAL FOR VESSELS ENTERING THE STURGEON BAY SHIP CANAL, ROCK ISLAND PASSAGE OR WHEN ARRIVING OR DEPARTING ESCANABA, GREEN BAY, MARINETTE OR ANY OTHER PORTS AND TERMINALS WITHIN GREEN BAY.
C. ESTIMATED TIME OF ARRIVAL MUST BE RECEIVED SIX HOURS PRIOR TO A VESSEL ARRIVAL TO ANY OF THESE POINTS OR ONCE A DAY BY 1000 (EASTERN). POSITION REPORTS MAY BE FILED WITH "SAULT TRAFFIC" EITHER BY LANDLINE (906.635.3232), FAX (906.635.3238), OR EMAIL (sootfc at uscg.mil).
D. A VESSELS ETA MUST BE UPDATED WHENEVER THE ARRIVAL TIME CHANGES BY MORE THAN SIX HOURS.
E. MARINERS ARE ASKED TO ESTABLISH VHF RADIO CONTACT WITH THE SERVICING ICEBREAKER ON VHF-FM CHANNEL 16 APPROXIMATELY ONE HOUR BEFORE REACHING THE APPROPRIATE SERVICE AREA.// BT
#0001
NNNN

Appendix F:
Example Safety Marine Information Broadcast

SAFETY MARINE INFORMATION BROADCAST SHEET

CHANNEL 16 "SECURITE (3) HELLO ALSTAS, TI USCG SECTOR DETROIT(2) FOR SAFETY MARINE INFORMATION BROADCAST REGARDING SAFETY ZONE FROM CATAWBA ISLAND, OH TO SOUTH BASS ISLAND, OH, SHIFT AND LISTEN SHIFT AND LISTEN CHANNEL 22A, 157.1 MHZ...OUT"

CHANNEL 22A "SECURITE (3) HELLO ALSTAS, TI USCG SECTOR DETROIT(2)"**~break~**

THE COAST GUARD IS ESTABLISHING A SAFETY ZONE ON PORTIONS OF THE ST. CLAIR RIVER IN THE VICINITY OF RUSSELL ISLAND, THE NORTH CHANNEL, THE MIDDLE CHANNEL AND THE CHENAL ABOUT ROND CHANNEL FROM SUNDAY MORNING, JANUARY 25, 2015 THROUGH MONDAY NIGHT, JANUARY 26, 2015.

ALL U.S. WATERS OF THE **ST. CLAIR RIVER** FROM LATITUDE 42°38'N, NORTH OF LOCUST POINT TO LATITUDE 42°36'N, JUST NORTH OF SQUIRREL ISLAND; THE **ENTIRE NORTH CHANNEL** FROM ITS MOUTH AT RUSSELL ISLAND TO ITS END AT ANCHOR BAY AT POSITION 42°38'35"N; 082°41'03"W IN LAKE ST. CLAIR; **THE ENTIRE MIDDLE CHANNEL** FROM ITS MOUTH ON THE NORTH CHANNEL TO ITS END AT POSITION 42°33'27"N; 082°41'14"W IN LAKE ST. CLAIR; AND **THE ENTIRE CHENAL ABOUT ROND CHANNEL** FROM ITS MOUTH AT THE NORTH CHANNEL TO ITS END AT POSITION 42°36'18"N; 082°41'55"W IN LAKE ST. CLAIR.

THIS AREA WILL BE CLOSED TO ALL PEOPLE AND VESSEL TRAFFIC FROM 9 AM ON SUNDAY, JANUARY 25, 2015, UNTIL 11:59 PM ON MONDAY, JANUARY 26, 2015.

ANY ICE IN THIS AREA SHOULD BE CONSIDERED UNSAFE AND THE COAST GUARD ADVISES EVERYONE TO STAY CLEAR. IN CASE OF AN EMERGENCY RELATED TO THE TRANSIT, THE LOCAL COAST GUARD STATION, AND COAST GUARD SECTOR DETROIT MAY BE CONTACTED ON CHANNEL 16 VHF-FM.

~break~
"THIS IS USCG SECTOR DETROIT, OUT"

CUC NOTE: BEGIN BCST IMMEDIATELY AND BCST EVERY HOUR, CANCEL AT 2359 ON MONDAY, 26JAN15.

RELEASED BY: LCDR NICK SENIUK

(TIME OF B-CAST)		(MONTH)	(INITIALS)	(TIME OF B-CAST)		(MONTH)	(INITIALS)
XXX	Z	11/CHL 22&16		**XXX**	Z	11/CHL 22&16	
XXX	Z	11/CHL 22&16		**XXX**	Z	11/CHL 22&16	
XXX	Z	11/CHL 22&16		**XXX**	Z	11/CHL 22&16	
XXX	Z	11/CHL 22&16		**XXX**	Z	11/CHL 22&16	
XXX	Z	11/CHL 22&16		**XXX**	Z	11/CHL 22&16	
XXX	Z	11/CHL 22&16		**XXX**	Z	11/CHL 22&16	
XXX	Z	11/CHL 22&16		**XXX**	Z	11/CHL 22&16	
XXX	Z	11/CHL 22&16		**XXX**	Z	11/CHL 22&16	
XXX	Z	11/CHL 22&16		**XXX**	Z	11/CHL 22&16	
XXX	Z	11/CHL 22&16		**XXX**	Z	11/CHL 22&16	
XXX	Z	11/CHL 22&16		**XXX**	Z	11/CHL 22&16	

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Appendix G:
Example Press Release

Sector Northern New England
South Portland, Maine

U.S. Department of Homeland Security
United States Coast Guard

Release Date: 03/30/15
Public Affairs Officer: 207-347-5015
24hr Command Center: 207-767-0302

News Release:

COAST GUARD TO BREAK ICE ON THE KENNEBEC RIVER

U.S. Coast Guard Cutter Tackle (left) will be joined by two sister ships, Shackle and Bridle, and U.S. Coast Guard Cutter Thunder Bay (right) to break ice on the Kennebec River on Wednesday.

SOUTH PORTLAND, Maine – Beginning Wednesday, April 1, 2015, the Coast Guard will conduct icebreaking operations in the main channel of the Kennebec River from Merrymeeting Bay to Gardiner, Maine. The purpose of the icebreaking operation is to reduce the risk of ice jam flooding as snow and river ice begins to melt and flow out to sea.

The operation, known as the Kennebec River Spring Break-out, will be managed by Coast Guard Sector Northern New England in South Portland, in close partnership with Maine Emergency Management Agency, National Weather Service, U.S. Geological Survey, Maine Department of Transportation, and Maine Marine Patrol. These agencies have been meeting weekly to assess the risk of flood potential in the state.

“The Coast Guard has helped reduce ice jam flooding in the Kennebec River for decades and we are excited to have the opportunity to assist once again,” said Lt. David Bourbeau, Chief of the Waterways Management Division for Coast Guard Sector Northern New England. “For most of the winter, our cutters have worked very hard to facilitate the movement of petroleum products, passenger ferries, and fishing vessels throughout the state. Now our focus has shifted to clearing as much ice as we can to prevent ice jam flooding for communities along the riverbanks.”

The Coast Guard will use all four icebreaking tugs homeported in Maine during the multi-day operation: 140-foot Rockland-based USCG Cutter Thunder Bay, 65-foot Portland-based USCG Cutter Shackle, 65-foot Rockland-based USCG Cutter Tackle, and 65-foot Southwest Harbor-based USCG Cutter Bridle.

As Coast Guard units prepare for icebreaking operations on the Kennebec River, the public should remove their ice fishing shacks as soon as possible, if safe to do so, and should refrain from being on the river during icebreaking operations.

Coast Guard icebreaking operations will be visible from the shoreline and bridges that span the Kennebec River. Media are asked to contact Lieutenant David Bourbeau at 207-347-5015 for additional information.

Appendix H:
Example Daily Ice Mission Report

Daily Ice Mission Report

Cutter: _____ **Date:** _____

Purpose of Ice Breaking: _____ **Mission Hours:** _____ **Ice Miles:** _____
Emergency Operations–**EO**, Flood Control–**FC**, Preventative–**PI**, Commerce–**FN**, Other–**Misc** (include transit time) (total miles operating in ice)

Area (from list on page 2 of this form)	Ice Conditions		
	Type	Thickness	%Coverage/Remarks

Vessel Assistance Data: **Number of F/V Assisted:** _____ **Number of M/V Assisted:** _____

Vessel Name	Vessel Type	Destination	Cargo			
			Type	Tonnage	Gallons	Value

Adequacy of Ice Breaking Platforms: _____

Potential Problem Areas: _____

Estimate of Future Ice Conditions within Area: _____

Future Plans and Recommendations: _____

Daily Ice Mission Report

Cutter: _____ **Date:** _____

Purpose of Icebreaking: _____ **Mission Hours:** _____ **Ice Miles:** _____
Emergency Operations–EO, Flood Control–FC, Preventative–PI, Commerce–FN, Other–Misc
(include transit time)
(total miles operating in ice)

Area (from list on page 2 of this form)	**Ice Conditions**		
	Type	**Thickness**	**Percent Coverage/Remarks**

Vessel Assistance Data: **Number of F/V Assisted:** _____ **Number of M/V Assisted:** _____

Vessel Name	**Vessel Type**	**Destination**	**Cargo**			
			Type	**Tonnage**	**Gallons**	**Value**

Adequacy of icebreaking platforms: _____

Potential problem areas: _____

Estimate of future ice conditions within area: _____

Future plans and recommendations: _____

Appendix I:
Example End of Season Report (truncated)

U.S. Department of Homeland Security
United States Coast Guard

Commander
USCG Sector Detroit

110 Mount Elliott Ave.
Detroit, MI 48207
Phone: (313)568-9508
Fax: (313)568-9581

16155
01 June 2015

MEMORANDUM

From: Scott B. Lemasters, CAPT
CG SECTOR Detroit

To: CCGD NINE (dpw)

Subj: 2014 – 2015 OPERATION COAL SHOVEL ANNUAL REPORT

Ref: (a) Domestic Icebreaking Policy and Reporting Requirements, COMDTINST 16151.1C
(b) Ninth District Icebreaking Policy and Procedures, D9INST M16150.2B
(c) Operation Coal Shovel OPORDER 01-15

1. This report outlines significant events occurring during Operation Coal Shovel for the 2014 – 2015 ice season and is submitted in accordance with reference (b). A detailed summary of Operation Coal Shovel is contained in Enclosure (1).

2. Operation Coal Shovel commenced on January 8, 2015 and concluded on April 17, 2015. In support of Operation Coal Shovel, U.S. Coast Guard Icebreakers conducted a total of 2,429.5 hours.

3. The Sector Detroit point of contact for this report is CWO3 Robert Zamora at (313) 568-9523.

#

Enclosures: (1) Operation Coal Shovel Statistical Data Summary
(2) Operation Coal Shovel Weekly Summaries
(3) Vessel Queue System Employment (January 10 to January 28, 2015)
(4) USCGC BRISTOL BAY End of Season Ice Report
(5) USCGC HOLLYHOCK End of Season Ice Report
(6) USCGC MACKINAW End of Season Ice Report
(7) USCGC NEAH BAY End of Season Ice Report
(8) USCGC NEAH BAY (MORRO BAY Crew) End of Season Ice Report

Copy: Sector Sault Ste Marie
Sector Buffalo
MSD Massena
CGC MACKINAW
CGC HOLLYHOCK
CGC BRISTOL BAY
CGC NEAH BAY
CGC MORRO BAY

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Appendix J:
Example Daily OPSUM

Daily OPSUM feeder (Tactical Control to District):

OPERATION COAL SHOVEL

Closed Navigation Season

01 February 2016

Lake Huron Division: Commercial vessels are moving unhindered by ice. There is no USCG asset assigned to the division.

St. Clair and Detroit River Division: Commercial vessels are moving unhindered by ice. CCGS SAMUEL RISLEY moored Sarnia, I/B Standby.

Erie Division: CCGS GRIFFON anchored IVO Western Basin and will moor in Amherstburg, I/B Standby. Commercial vessels are moving unhindered by ice.

Lake Ontario Division: There is no USCG asset assigned to the division. Commercial vessels are moving unhindered by ice.

Daily Cutter OPSUM:

```
R 090000Z APR 15
FM USCGC HOLLYHOCK
TO CCGDNINE CLEVELAND OH//DP/DPW/DPW-2/DR/DRE/DRM/DRMC//
INFO COMCOGARD SECTOR DETROIT MI
COMCOGARD SECTOR SAULT STE MARIE MI
COMCOGARD SECTOR BUFFALO NY
COMCOGARD SECTOR LAKE MICHIGAN WI
USCGC MACKINAW
USCGC ALDER
USCGC BRISTOL BAY
USCGC MOBILE BAY
USCGC BISCAYNE BAY
USCGC KATMAI BAY
USCGC MORRO BAY
USCGC NEAH BAY
USCGC BUCKTHORN
BT
UNCLAS FOUO //N03121//
SUBJ: USCGC HOLLYHOCK OPSUM/INTENTIONS REPORT FOR 08 APR 15
```

1. PERIOD COVERED 072000R APR 15 TO 082200R APR 15.
2. A. 082200R APR 15 POSITION: MOORED STATION ST. IGNACE IN BRAVO-12 STATUS.
   B. 090800R APR 15 EST. POSITION: MOORED STATION ST. IGNACE IN BRAVO-12 STATUS.
   C. DATE DEPARTED HP: 04APR15
   D. SCHEDULED DATE RTHP: TBD
   E. NPOC: ST IGNACE, MI
   F. DAFHP THIS TRIP: 4, DAFHP FYTD 52
3. LIQUID LOAD (PCT):
   MDE FUEL: 48
   POTABLE WATER: 76
   SEWAGE / GREY WATER: 32
4. WEATHER:
   DESC: BKN
   WIND: 076/14 KTS
   SEAS: N/A SWELLS: N/A
   VIS: 9 NM
   AIR TEMP: 35
   WATER TEMP: 31
5. MATERIAL CONDITION:
   A. CASREP, 13009, LOW RESISTANCE IN SSDG 2. MINIMAL MISSION IMPACT.
   B. CASREP, 14004, THRUSTER GENERATOR, MINIMAL MISSION IMPACT.
   C. CASREP, 14022, BOW THRUSTER LEAK, MANAGEABLE MISSION IMPACT.
   D. CASREP, 15002, NO. 1 REEFER COMPRESSOR, MINIMAL MISSION IMPACT.
   E. CASREP, 15003, NO. 2 REEFER COMPRESSOR, MINIMAL MISSION IMPACT.
6. PATROL EFFORTS:
   A. ICE-BREAKING HRS: TOTAL 26 HOURS IN MACK STRAITS.

WW	TIER	DA	VSL ASSISTED	VA	PI	MC
MACK STRAITS	1	12/2	CSL LAURENTIAN	0/0	0/0	0/12
			CSL NIAGARA			
			JOSEPH H. THOMPSON			

   B. SUMMARY: ESCORTED THREE VESSELS FROM LANSING SHOAL EASTBOUND ACROSS MACK STRAITS.
   7. CREW FATIGUE LEVEL:
   A. CURRENT CREW FATIGUE BASED ON GAR MODEL: AMBER.
   B. ABILITY FOR CREW TO SURGE FOR 24HRS: GREEN.
8. MISSION READINESS
   A. LE STATUS: FMC, HOLLYHOCK HAS 3 QUALIFIED BOARDING OFFICERS/BTMS.
   B. ICE RESCUE STATUS: FMC, HOLLYHOCK HAS 4 QUALIFIED ICE RESCUERS.
9. INTENTIONS:
   A. TRANSIT TO ST. IGNACE, MI. RON 1.
   B. FUEL 09APR15 THEN U/W IAW TACON TASKING.
10. REMARKS: MACK STRAITS ARE A COMPLETE MESS. THE PREVIOUSLY ESTABLISHED TRACK BETWEEN THE BRIDGE AND WHITE SHOAL IS COLLAPSED. BETWEEN WHITE SHOAL AND LANSING SHOAL, CONDITIONS ARE DYNAMIC AS MULTIPLE LARGE THICK PLATES ARE SHIFTING AROUND WITH THE WIND.
11. POC: LTJG HUNT, UNDERWAY CELL PHONE: (216) 310-6530.

Appendix K:
Example Sector OPSUM

OP TACONITE
WEEKLY SUMMARY
22-28 FEB 2016

Ref: CCGD9INST M16150.2B

1. Situation: A warm front settled in across the Great Lakes that reduced the percentage of ice coverage from 22% to 15%. There was no commercial activity in the Straits of Mackinac, northern Lake Michigan or the St. Mary's River. Op Taconite resources provided ice breaking assistance to the Drummond Island Ferry and the US Army Corps of Engineers at the Soo Locks. 250800R, COTP Sault Sainte Marie opened the waters between Mackinac Island and St. Ignace per 33 CFR Part 165.901. All goals and measures of effectiveness were met this reporting period. Op Taconite continues.

2. Weekly Performance Standards:

Qty	Measure of Effectiveness
00	Search and Rescue Response Requests
00	Urgent Vessel Response Requests
00	Exigent Community Service Requests
02	Navigation Assistance Requests
00	U.S. Vessels Directly Assisted
00	CA Vessels Directly Assisted
00	FF (Salties) Directly Assisted
02	Total Transits Assisted
00	Waterways Restrictions (hrs)
00	Waterways Closures (hrs)
100%	Tier One Availability (168 hrs of 168 Hrs)

3. Tier One Waterway Availability:

Waterway	Hours	Hours Hindered	Percentage
St. Marys River	168	0	100%
Straits of Mackinac	168	0	100%

4. Seasonal Performance Standards

Qty	Measure of Effectiveness
00	Search and Rescue Response Requests
00	Urgent Vessel Response Requests
00	Exigent Community Service Requests
57	Navigation Assistance Requests
11	U.S. Vessels Directly Assisted
02	CA Vessels Directly Assisted
00	FF (Salties) Directly Assisted
60	Total Transits Assisted
00	Waterways Restrictions (hrs)
00	Waterways Closures (hrs)
100%	Tier One Availability (1116 hrs of 1116 Hrs)

5. Active Operational (Waterway) Controls

Waterway	Segment	DTG	Control Type	MISLE Activity
St Marys River	Little Rapids Cut	021815Z DEC 16	VTS Measure	5773940
St Marys River	Pipe Island Passage	161300Z JAN 16	VTS Measure	5797969
St Marys River	West Neebish Channel	161300Z JAN 16	VTS Measure	5797973
Lake Huron	South Channel	221400Z JAN 16	COTP RNA	5801088
Lake Michigan	Grays Reef Passage	221400Z JAN 16	COTP RNA	5801154

6. Tier One Waterway Status:

Waterway	Status
St. Marys River	Open; Ice Breaker
Straits of Mackinac	Open; Ice Breaker

7. Weekly Lost Cutter Hours:

Lost Cutter Hours			
Cutter	**Casualty Related**	**Other - Logistics**	**Casualty (Unsked Charlie)**
N/A	00	00	00

8. Seasonal Lost Cutter Hours:

Lost Cutter Hours			
Cutter	**Casualty Related**	**Other - Logistics**	**Casualty (Unsked Charlie)**
N/A	00	00	00

9. Future Plans: Monitor ice conditions, commercial vessel movements, availability of commercial providers, and requests for ice breaking services. Provide assistance per Operation Taconite IAP.

Appendix L:
Example Weekly OPSUM

COAL SHOVEL WEEKLY SUMMARY

DD MON YYYY thru DD MON YYYY

1. Situation: A bottom line assessment of relevant ice, weather, traffic, and tasking content for the week.

   Ex: Unseasonably warm temps and light wind persist throughout AOR, new ice growth limited to Saginaw Bay w/ 6/10 shore ice, no impact to navigation, no assets assigned to date. Do not anticipate ice-ops w/in 7 day window.

   Ex: HURON remains ice free, no asset assigned. Ice growth continues in SCR, COTP activated alt. 1-way pattern w/ IB assist. HOLLYHOCK/NEAH BAY assigned. Detroit River is ice-free. Significant ice in West Erie, BRISTOL/RISLEY assigned convoy ops. Cold temperatures expected to persist, wind event forecasted for Tuesday, 01/18. Traffic continues to move with IB support. Eastern Erie ice-free, no asset assigned.

2. Performance Standards this week:

Qty	Measure of Effectiveness
00	Search and Rescue Response Requests
00	Urgent Vessel Response Requests
00	Exigent Community Service Requests
00	Navigation Assistance Requests
00	U.S. Vessels Assisted
00	CA Vessels Assisted
00	Waterways Restrictions (hrs)
00	Waterways Closures (hrs)
XX%	Tier I Availability
00	Icebreaking Resource Hours
00	Vessels beset

3. Weekly Hours per Tier I Waterway:

Waterway	Hours	Hours Closed	Percentage
St. Clair River	168	0	100
Detroit River	168	0	100
Pelee Passage	168	0	100
St. Lawrence Seaway	Not Included		

4. Seasonal Totals:

Qty	Measure of Effectiveness
00	Search and Rescue Response Requests
00	Urgent Vessel Response Requests
00	Exigent Community Service Requests
00	Navigation Assistance Requests
00	U.S. Vessels Assisted
00	CA Vessels Assisted
00	Waterways Restrictions (hrs)
00	Waterways Closures (hrs)
XX%	Tier I Availability
00	Icebreaking Resource Hours
00	Vessels beset

5. Seasonal Hours per Tier I Waterways:

Waterway	Hours	Hours Closed	Percentage
St. Clair River	XXXX	0	100
Detroit River	XXXX	0	100
Pelee Passage	XXXX	0	100
St. Lawrence Seaway	Not Included		

6. Waterway Status:

Waterway	Status
St. Clair River	*Restricted. Alternating one-way traffic with icebreaker escort.*
Detroit River	*Closed. ATB EVERLAST beset at Livingstone Channel.*
Erie Islands	*Closed. Safety Zone active for recreational ice users.*

7. Lost Cutter Hours:

Lost Cutter Hours			
Cutter	Casualty Related	Other - Logistics	Casualty (Charlie)
NEAH BAY	*06*	*00*	*00*

8. Seasonal Lost Cutter Hours:

Lost Cutter Hours			
Cutter	Casualty Related	Other - Logistics	Casualty (Charlie)
NEAH BAY	*06*	*00*	*00*

9. Future Plans:

Ex: Monitor continued ice growth and forecasted weather. Do not anticipate activating OPERATION COAL SHOVEL within next seven days.

Appendix M:
Example OPORD

R 271540Z MAR 15
FM COMCOGARD SECTOR NORTHERN NEW ENGLAND ME
TO USCGC THUNDER BAY
USCGC TACKLE
USCGC BRIDLE
USCGC SHACKLE
INFO COGARD AIRSTA CAPE COD MA
CCGDONE BOSTON MA//DXO/DPW//
USCGC ABBIE BURGESS
USCGC MARCUS HANNA
COGARD ANT SOUTH PORTLAND ME
COGARD STA SOUTH PORTLAND ME
COGARD STA BOOTHBAY HARBOR ME
BT
UNCLAS //N16500//
SUBJ: OPERATIONS ORDER - KENNEBEC RIVER SPRING BREAK-OUT
1. SITUATION. On 26 March 15, Maine River Flow Advisory Commission (MERFAC) assessed ice jam flood potential for the Kennebec River to be normal for approximately 7 days. After which, the ice jam flood potential in the Kennebec River will likely increase because of significant rainfall that is forecasted near the end of the week of 30 March. In response to this concern, Maine Emergency Agency (MEMA) has requested the CG to clear ice in the Kennebec River to reduce the risk of hazardous water stages and flooding that may be caused by ice obstructions.
2. MISSION. The objective of this operation, referred to as the Kennebec River Spring Break-Out, is to break and clear ice from Chops Point to Gardiner, ME. Sector Northern New England (SNNE) will coordinate command and control of the operation, and ice breaking will be executed by CGC THUNDER BAY, CGC SHACKLE, CGC TACKLE and CGC BRIDLE.
3. ICE CONDITIONS. Kennebec River is covered with 100 percent fast ice from Chops Point to Augusta. Ice and snow is estimated to be 20 inches to 24 inches thick with approximately 7 inches of black ice north of the Maine Kennebec Bridge. Thinner ice and snow is expected south of the Maine Kennebec Bridge to Chops Point.
4. CONCEPT OF OPERATIONS. THUNDER BAY, SHACKLE, TACKLE and BRIDLE will proceed to Bath Iron Works (BIW), Bath, ME with plans to be underway from BIW to begin ice breaking operations on Wednesday, 01 April, time to be determined by THUNDER BAY. Cutters will break ice in the main channel of the Kennebec River from Chops Point to the Maine Kennebec Bridge at Richmond at which point SHACKLE, TACKLE and BRIDLE will pass through the bridge and break ice to Gardiner. If ice conditions north of the Maine Kennebec Bridge exceed the

capabilities of the 65 WYTLs, the focus of operations should shift to:
a. Breaking, clearing, and flushing ice in the area of the Maine Kennebec Bridge regulated navigation area to allow MEDOT to resume operations to remove the former Richmond Dresden Bridge and piers.
b. Breaking, clearing, and flushing ice south of the Maine Kennebec Bridge to Doubling Point.
c. Cutters will resume ops as needed on subsequent days to meet the objectives of this OPORDER. The decision to go or no-go for subsequent op days will be made by THUNDER BAY. Ice breaking operations will continue until the river is flowing freely and the potential for flooding is reduced.
5. MOORING PLAN. Pier space is limited at Bath Iron Works (BIW) due to dredging. Mooring plan for all cutters is being coordinated by THUNDER BAY. BIW POCs are: Daniel Hartsig at 207-844-3280 or Kevin Flanagan at 207-841-2476, and Captain Richard Potter, Tug Kennebec at 207-721-3521.
6. COMAND AND CONTROL. SNNE shall be Operational Commander for the Kennebec River Spring Break-Out. THUNDER BAY will be SOPA for cutters south of the Maine Kennebec Bridge. TACKLE will be SOPA for cutters north the Maine Kennebec Bridge. All cutters shall use channel 81A VHF/FM and broadcast AIS in the clear. SHACKLE, TACKLE and BRIDLE shall make position and ops reports to THUNDER BAY. THUNDER BAY will make position and ops reports for all cutters to SNNE Command Center (SCC) on 23A VHF/FM. SCC will then notify the SNNE command staff via text.
7. BRIDGES. Maine Department of Transportation (MEDOT) has been notified of the requirement for multiple openings at Carlton Bridge during this operation. Carlton Bridge tender is Ms. Jenny Gray at 207-443-2482 or 207-522-4644. Alternate POC is Mr. Jeff Naum, MEDOT Superintendant of Bridges at 207-446-1235.
8. ICE SHACKS. Maine Marine Patrol (MMP) is aware of CG plans to break ice has agreed to notify the owners of fishing shacks that shacks must be removed from the ice prior to 31 March. If shacks are observed in the ice breaking area, SHACKLE, TACKLE and BRIDLE shall not endanger them and shall notify THUNDER BAY. POC for MMP is Major Rene Cloutier at 207-633-9596 or 207-592-2364.
9. ICE REPORTS. TACKLE shall make a consolidated ice report to THUNDER BAY at the end of each operational period for all 65 ft WYTLs. THUNDER BAY will make a consolidated ice report to SNNE WWM at the end of each operational period for all cutters. Ice reports should include the type of ice, thickness and coverage remaining in the river and a recommendation for ice breaking effort that may be needed during the next operational period.
10. DIGITAL IMAGERY. Cutters shall obtain digital imagery and/or video of ice breaking operations whenever practical.
11. AIR SUPPORT. The following CG AUXAIR flights are scheduled. The primary objective is to observe/report ice conditions, large areas

of open water, ice jams and fishing shacks from Chops Point to Augusta:
a. 29 March - Steve Brown, Aircraft 201UA, 603-930-6690.
b. 01 April - Henry Livingston, Aircraft N1327G, 617-515-2212.
C. 02 April - Dennis Bradley, Aircraft N7694N, 207-469-8095.
d. 03 April - Steve Brown, Aircraft 201UA, 603-930-6690.
12. AFTER ACTION REPORTS. Cutters shall submit after action (AAR) reports via email to SNNE DOMICE Manager within 7 days upon conclusion of this OPORDER. AARs should include total hours/miles underway, digital imagery/videos, and best practices/lessons learned that may be useful for planning future Kennebec River ice breaking operations.
13. WEATHER. Operational plans and tasking contained in this OPORDER may be changed or modified by THUNDER BAY for actual or forecasted weather.
14. MEDIA. Inquiries by media should be forwarded to SNNE Public Affairs Officer, LT Scott McCann at 207-767-0318 or 207-767-0303, or Assistant Public Affairs Officer, LTJG Connan Ingham at 207-741-5445. After hours, media inquiries should go to SNNE Command Duty Officer at 207-767-5422.
15. MISLE Case Number for this OPORDER is 720227, MISLE Activity Number is 5089555.
16. POCs: LT David Bourbeau, SNNE Waterways Management Division Chief, 207-347-5015 or 207-899-6291, and CWO4 Robert Albert, SNNE DOMICE Mission Manager at 207-347-5026 or 207-899-6285.
BT
NNNN

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Appendix N:
Incident Action Plan
(truncated)

OPERATION TACONITE
INCIDENT ACTION PLAN
2016

U.S. COAST GUARD
SECTOR SAULT SAINTE MARIE

INCIDENT ACTION PLAN

Incident Name: OP TACONITE 2016 Plan Number: _1_ Date prepared: 01 DEC 2015

OPERATIONAL PERIOD COVERED BY THIS PLAN:

Start Date: __Dec 2015__ **Start Time:** _____

End Date: __May 2016__ **End Time:** _____

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- Lake Michigan Division Assignments, ICS 204
- Queuing Vessels, ICS 204
- Radio Communications Plan, ICS 205
- Air Operations Summary, ICS 220

Submitted By: ___M. S. GILL, USCG_
(Planning Section Chief)

Approved By: ____S. C. TESCHENDORF, USCG_
(Incident Commander)

ICS IAP Cover

Appendix O:
Example Messages

Request for Forces Message

```
P 231425Z JAN 14
FM COMCOGARD SECTOR BALTIMORE MD
TO CCGDFIVE PORTSMOUTH VA//DPW//
INFO USCGC JAMES RANKIN
USCGC FRANK DREW
COMCOGARD SECTOR DELAWARE BAY PA
USCGC WILLIAM TATE
BT
UNCLAS //N16155//
SUBJ: REQUEST FOR FORCES: DOMESTIC ICE OPERATIONS SUPPORT A.
D5INST 3010, FIFTH DISTRICT ORGMAN, CHAPTER 7
1. OPERATION/EVENT: ICEBREAKING IN THE UPPER CHESAPEAKE BAY
(UCB) AND C(AND)D CANAL. CURRENT ICE CONDITIONS EXPECTED TO
INCREASE.
2. DATE: 25-31 JAN 14.
3. RESOURCE CAPABILITY REQUESTED: ONE WLM.
4. REASON: ASSET CAN REMAIN UNDER THE OPCON OF D5 DPW.
5. OTHER: SECTOR ICEBREAKING ASSET WILL NOT BE AVAILABLE FOR OPS
IN UCB DURING THIS PERIOD. IN ADDITION, ICE CONDITIONS IN UCB
WILL LIKELY EXCEED LIMITS OF SECTOR ICEBREAKING ASSET.
6. POC: WATERWAYS MANAGEMENT DIV AT 410-576-2674 OR 410-576-
2519, OR SCC AT 410-576-2693.
BT
NNNN
```

Daily Cutter Ice Report

```
RTTUZYUW RHOIAAA0001 0221429-UUUU--RUOIBBB.
ZNR UUUUU
R 212245Z JAN 16
FM USCGC MOBILE BAY
TO COMCOGARD SECTOR SAULT STE MARIE MI
INFO CCGDNINE CLEVELAND OH
COMCOGARD SECTOR LAKE MICHIGAN WI
USCGC MACKINAW
USCGC ALDER
USCGC HOLLYHOCK
USCGC BRISTOL BAY
USCGC KATMAI BAY
USCGC NEAH BAY
USCGC BISCAYNE BAY
USCGC MORRO BAY
BT
UNCLAS
PASS TO OFFICE CODES:
INFO CCGDNINE CLEVELAND OH//DPW/CC//
SUBJ/ICE REPORT 21JAN16//
1. POSITION 211618S JAN 16: MOORED SAWYER PARK PIER, STURGEON
BAY, WI.
2. 0700S: SAWYER PARK PIER TO 2 NM SOUTH OF PESHTIGO LT. TEN
TENTHS. SIX INCHES OF REFROZEN PLATE AND BRASH. OCCASIONAL AREAS
OF 12-24 IN RUBBLE RIDGES IVO SHERWOOD PT.
3. 0858S: 2 NM SOUTH OF PESHTIGO LT TO 6 NM EAST OF OCONTO. TEN
TENTHS. EIGHT INCHES OF PLATE.
4. WIND: 5 KTS AT 290. VIS: 7 NM. TEMP: 21/26.
REMARKS: TRACKS ARE HOLDING.
BT
#0001
NNNN
```

Daily Icebreaker Tasking Message

```
P DDTTTTZ MM YY
FM COMCOGARD SECTOR DETROIT MI
TO USCGC HOLLYHOCK
USCGC BRISTOL BAY
USCGC MORRO BAY
INFO COGARD AIRSTA DETROIT MI
CCGDNINE CLEVELAND OH//DP/DPW/DPW-2/DR/DRE/DRM/DRMC//
COMCOGARD SECTOR SAULT STE MARIE MI
BT
UNCLAS //N16150//
SUBJ: OP COAL SHOVEL DIVISION ASSIGNMENTS AND TASKING 001-16
A. OP COAL SHOVEL OPORDER. THIS OPERATIONAL PERIOD IS DDXXXXR
MMM YY TO DDTTTTR MMM YY
1. HURON DIV - ASSIGNED ASSET: HOLLYHOCK
A. ANTICIPATED TFC:
NAME      ETD       ETA       PORT/TERMINAL
------    ---       ---       ------------------
(COMMERCIAL PROVIDERS ARE AVAILABLE FOR TIER 2/3 WATERWAYS.)
B. CURRENT SCHEDULE/TASKING:
HOLLYHOCK: MONITOR ICE CONDITIONS IN LHC AND SOUTHERN LAKE
HURON. CONDUCT TRACK MAINTENANCE AS REQUIRED.
C. FUTURE SCHEDULE/TASKING:
HOLLYHOCK: PROCEED TO PORT HURON FOR SCHEDULED LOGISTICS ON
DDTTTTR MMM YY. ASSUME ICE-BREAKING STBY.
2. ST CLAIR AND DETROIT RIVER SYSTEM DIV - ASSIGNED ASSET: MORRO BAY.
A. ANTICIPATED TFC:
VESSEL         U/B            D/B       DESTINATION         ETA
NAME           EAST OUTER          LHC 11/12
------         ------         --------- -----------         ---
TRAFFIC IS MOVING UNIMPEDED BY ICE.
COMMERCIAL PROVIDERS ARE AVAILABLE FOR TIER 4 WATERWAYS.
B. CURRENT SCHEDULE/TASKING:
MORRO BAY: CONDUCT TRACK MAINTENANCE AS REQUIRED IN LSC.
C. FUTURE SCHEDULE/TASKING:
MORRO BAY: PROCEED TO DETROIT FOR SCHEDULED LOGISTICS ON DDTTTTR
MMM YY. ASSUME ICE-BREAKING STBY.
3. ERIE DIV - ASSIGNED ASSET: NONE
A. ANTICIPATED TFC:
VESSEL         E/B            W/B       DESTINATION         ETA
NAME           EAST OUTER          PELEE
------         ------         --------- -----------         ---
TRAFFIC IS MOVING UNIMPEDED BY ICE.
B. CURRENT SCHEDULE/TASKING: NONE.
C. FUTURE SCHEDULE/TASKING: NONE.
```

```
4. SEAWAY DIV - ASSIGNED ASSET: NONE
A. ANTICIPATED TFC:
NAME      ETD       ETA       PORT/TERMINAL
------    ---       ---       ------------------
TRAFFIC IS MOVING UNIMPEDED BY ICE.
B. CURRENT SCHEDULE/TASKING: NONE.
C. FUTURE SCHEDULE/TASKING: NONE.
5. AIR OPERATIONS BRANCH - ASSIGNED ASSET: AIRSTA DETROIT
A. CURRENT SCHEDULE/TASKING: NONE.
B. FUTURE SCHEDULE TASKING: NONE.
6. POC: ICE OFFICER: (313) 475-7475
BT
NNNN
```

Appendix P:
Example Icebreaking Request Sheet

Date: _____ **Time:** _____ **Unit:** _____

1. Name of Person Making Request: _____ Organization: _____

   Vessel Name: _____ Vessel Type: _____

   Vessel Description: _____ Phone/Radio Freq: _____

2. Detailed Location: _____

   Depth at Mean Low Water: _____

   Maneuvering Room: _____

   Hazards (mooring balls, wrecks, etc.): _____

3. Reason for Ice Breaking Request: _____

4. Type of Ice: _____ Thickness of Ice (inches): _____ Coverage (%): _____

   How long has ice been in area: _____

5. What are the consequences if ice breaking is not conducted: _____

   _____

6. Advise R/S to report any changes in conditions and that a representative must be on scene upon Coast Guard arrival. (INIT:_____)

   Name and Contact information for on scene representative: _____

   _____

FOR COMMAND CENTER EVALUATION PURPOSES:

1. Tides: High: _____ Low: _____

   High: _____ Low: _____

2. WX Forecast: Seas: _____ Winds: _____ Temp: _____

   _____

3. Best Available Ice Breaking Resource: _____

4. Notifications: CDO: _____ Prevention: _____ Other_____

   Unit to be tasked/determine timeframe to perform ice breaking: _____

5. Notify CDO/Prevention if unit is unable to respond: _____

6. Reassign Tasking (if needed): Unit: _____

7. Notify R/S prior to unit getting underway to respond (when applicable). Report any changes to the responding unit and CDO/Prevention.

8. Final Action: _____

   _____

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Appendix Q:
MTS Recovery Facility Status Sheet

DEPARTMENT OF HOMELAND SECURITY
U.S. Coast Guard
MARINE TRANSPORTATION SYSTEM RECOVERY FACILITY STATUS

OMB No.1625-xxxx
Expires: mm/dd/yyyy

U.S. Coast Guard _____ is gathering critical facility status information

for the port of _____ following _____.

Information you voluntarily provide will enable the U.S. Coast Guard (USCG) to understand your facility's current status and will be is used by the USCG Marine Transportation System Recovery Unit to prioritize port-wide recovery efforts.

This is a voluntary solicitation for information and is not mandatory; however, without this information, the USCG cannot properly assess the condition of your facility and must consider it closed with no critical impact until the USCG is able to conduct an on-scene assessment.

We request you review the criteria below and provide the information to:

Name	via Fax	via Email

SECTION I: FACILITY INFORMATION

1. Facility Name

2. Facility Status (Check one)

Fully Available ☐ Partially Available ☐ Not Available ☐

3. Describe Reason the Facility is *Partially Available* or *Not Available* and at what % capacity the facility is operating and when you anticipate it being fully available. *(i.e. no utility service, channel closure, damage to pier, reduced personnel, damage to facility, cranes, pumps or cyber attack.).*

(continue on page 2)

4. If you do not receive your next scheduled ship/barge on time what is the significant impact? *(i.e. your facility supplies the fuel for all city busses or an airport).*

(continue on page 2)

SECTION II: FACILITY CONTACT INFORMATION

5. Facility Point of Contact	6. Telephone	7. Fax	8. Email	9. Date

CG- (01/16) Page 1 of 2

MARINE TRANSPORTATION SYSTEM RECOVERY - FACILITY STATUS

Name of Event: Facility Name:

SECTION 1. FACILITY INFORMATION *(Cont.)*

Privacy Act Statement

Authority: 33 U.S.C. §1225, 46 U.S.C. §70103, and 50 U.S.C. §191 authorize the collection of this information.

Purpose: Following a port disruption, the U.S. Coast Guard must quickly gather port impact information to determine what infrastructure and support services are not available or only partially available. Gathering port disruption information enables the U.S. Coast Guard to provide critical input to those federal, state, and local response organizations that are engaging in restoring the port to its pre-disruption condition.

Routine Uses: It is used by the U.S. Coast Guard Marine Transportation System Recovery Unit to assess the condition of the port, prioritize recovery efforts, and gauge the effectiveness of the response.

Disclosure: This is a voluntary solicitation for information and is not mandatory; however the U.S. Coast Guard cannot properly assess the condition of the port without this valuable input.

CG-XXXX (01/16) Page 2 of 2

Appendix R:
Example Industry Feedback Letter

Lake Carriers' Association

The Greatest Ships on the Great Lakes

JAMES H. I. WEAKLEY, PRESIDENT
440-333-9995 • weakley@lcaships.com

July 21, 2015

Capt. Steven C. Teschendorf
Sector Commander
Sector Sault Ste. Marie

Captain Scott B. Lemasters
Sector Commander
Sector Detroit

Captain Brian W. Roche
Sector Commander
Sector Buffalo

Captain Amy Cocanour
Sector Commander
Sector Lake Michigan

Dear Captains Teschendorf, Lemasters, Roche and Cocanour:

Lake Carriers' Association would like to make the following observations on the U.S. Coast Guard's performance during the 2014/2015 ice season. Before we get down to specifics, we do sincerely thank both the U.S. and Canadian Coast Guards for their efforts this past ice season. After a mild stretch in December, the winter of 2014/2015 was again very challenging, but thanks to their efforts, LCA members were able to move 20 million tons of cargo between December 1, 2014 and April 30, 2015. These cargos sustained jobs and economic activity in every state in the Great Lakes basin and elsewhere.

In advance of our specific comments, we'd like to set the stage with a general assessment of the situation. The past two winters have been the most severe since the early 1990s. Depending on when one joined the industry or Coast Guard, these past two ice seasons are the most challenging ever witnessed. There are a lot of lessons to be learned, perhaps the most important of which is that industry and the Coast Guard must be able to respond quickly and creatively. We all recognize the value of procedures, guidelines and regulations, but they cannot hem us in. Each ice season will be different and hold unique challenges. Ice conditions will vary, as will demand for cargo and trade patterns. Some winters the icebreakers will be crewed with Captains who have worked in ice before; other winters they will be starting at the bottom of the learning curve. What this all means is both industry and the Coast Guard must be prepared to respond quickly and when necessary, outside the box. The ice conference held each fall is a valuable tool for preparing for the ice season to come, but the conditions that exist when winter arrives may require quick and repeated course changes.

Now to our specific comments:

1. **The economic impacts of cargo being delayed or cancelled because of ice are significant**. During the 2013/2014 ice season, LCA members saw their cargo total plummet by nearly 7 million tons compared to the 2012/2013 ice season. Martin Associates estimated that the shortfall in cargo movement cost the region's economy 3,830 jobs and $705 million in economic activity. LCA's members' float between January 1 and April 30 of this year was nearly 3.1 million tons less than the average for that timeframe during the years 2010-2013. That decrease in cargo movement cost the Great Lakes basin another 1,970 jobs and $356 million in economic activity. **IN TOTAL THEN, THE CARGOS THAT COULD NOT MOVE THESE PAST TWO ICE SEASONS COST THE REGION 5,800 JOBS AND $1,061,000,000,000 IN ECONOMIC ACTIVITY. See Attachments A and B.**

2. **Neither the U.S. nor the Canadian Coast Guard has enough icebreaking assets stationed on the Lakes.** To use a sports analogy, neither organization has any bench strength, so when a "starter" goes down with an injury, the whole team is affected. The MACKINAW's capabilities were reduced for most of the spring break out, and that was a contributing factor to the logjam in eastern Lake Superior. The ALDER suffered several casualties that effectively left western Lake Superior without an icebreaker for stretches of time. The U.S. Coast Guard must build and station another MACKINAW-class icebreaker on the Great Lakes. To cut a better track for the largest lakers, the new Great Lakes Icebreaker (GLIB) should be 75 feet wide. The Coast Guard should also transfer another 140-foot-long icebreaker tug to the Lakes to "pinch hit" for the 140 that is undergoing service life extension in the Coast Guard yard in Baltimore.

3. **Insufficient icebreaking resources delayed many vessels from sailing this spring.** LCA members collectively lost more than 200 days of navigation in March and April because they delayed sailing many vessels because of concerns the vessels would become beset in ice. They also did not want to risk a repeat of March/April 2014 when their vessels suffered ice damage that cost more than $6 million to repair. Even some of the vessels that got underway in April were intentionally kept out of certain waterways such as the St. Marys River for fear they would again face significant delays. These lost operating days will be impossible to recover. The vessels are already operating at their most efficient speed. Speed can be increased only for short distances such as seeking safe harbor. Load and discharge times cannot be significantly shortened. Of the 8 vessels that are currently not sailing, two are steamers that have been laid up for many years. It would take considerable effort and a significant expenditure to get their powerplants operable again. Another vessel is a straight-decker that has not sailed in a number of years, and since it lacks self-unloading gear, would be extremely limited in its ports of call. Another straight-decker has had its engines removed in preparation for a conversion that has been delayed indefinitely. A self-unloading barge needs significant cargo hold renewal before it could sail again. That leaves one steamship and two motor vessels that could be returned to service this year.

4. **U.S. (and Canadian icebreakers) need to work longer days.** We acknowledge this is a perennial request, but frankly, the situation has deteriorated. Even the heavies are working shorter days. As we have stressed before, in December and January we are facing the January 15 closing of the Soo Locks. Extensions of the lock season are not commonplace, and with the locks aging, will become even less so, as the Corps needs as long a closure as possible to perform much needed maintenance. In March and April there's a pressing need to replenish stockpiles. While the smaller crews on the 140s probably dictate that they work a "shorter" day, we are particularly disappointed the MACKINAW and the Canadian heavies have apparently reduced their operating hours.

   In keeping with our comment that we must not hem ourselves in, we are not going to suggest any specific work hours for any of the icebreaking vessels, but the heavies, with their larger crew complement, should work day or night, and as long as is safe and practicable. The 140s must maximize their time on station by overnighting in the ice. All icebreakers must conduct logistics more efficiently. There is no reason the icebreakers can't fuel at night, and if overnighting in their homeport, pump off sewage and take on water at night. Instead we frequently see the vessel sit idle overnight, and begin fueling and other logistics after sunrise and not be underway again until early afternoon.

5. **The Executive Officer on the heavies must be able to spell the Captain, so icebreaking can continue while the senior officer is off watch.** Self-explanatory.

6. **The ALDER's icebreaking capabilities are no match for western Lake Superior; station a 140 in Duluth/Superior and move the ALDER to the St. Marys River where her proven ability to maintain tracks would be most useful.** The ALDER (and HOLLYHOCK) are buoy tenders that were

later retrofitted with ice bands so they could perform some icebreaking. Their "straight-line" capabilities are sufficient for track maintenance, but they are not well suited for confined spaces or backing in ice. Given that Duluth/Superior generally experiences the some of the most severe ice conditions and, along with nearby Two Harbors and Silver Bay, is the hub of the Lakes iron ore and low-sulfur coal trades, the port needs a 140-foot icebreaking tug. A 140 would also be able to break out Thunder Bay more rapidly than the ALDER, so Duluth/Superior would not be without an icebreaking asset for days on end. The ADLER should be reassigned to Sault Ste. Marie, Michigan, and tasked with the St. Marys River and Straits of Mackinac as required.

7. **Icebreaking resources should not be tasked to a port or waterway too far in advance of scheduled vessel(s).** The port of Thunder Bay, Ontario, received its first vessel on April 10, yet the ALDER was dispatched to Thunder on March 18 and remained there until March 20. The Canadian icebreaker SAMUEL RISLEY spent March 30-31 in Thunder Bay. To our knowledge the two Canadian lakers that wintered in that harbor (ALGOSOO and CSL TADOUSSAC) were not getting underway at that time, so we must question the decision to commit icebreaking resources to a port in March when the first vessel bound for the port, the TECUMSEH, did not even get underway until April 4. Its original ETA was 1300 on the 8th, but the vessel did not actually arrive until April 10. The focus should have been on getting vessels loading in Duluth/Superior and Two Harbors underway toward the locks and assisting the first westbound transits when the Soo Locks opened on March 25. The April 9 dispatch of an icebreaker to Thunder Bay was appropriate, but the hours expended in the harbor in March were a waste of resources.

8. **The MARTHA BLACK should have been deployed to Whitefish Bay when initially requested rather than remain off Port Colborne.** When LCA asked that the MARTHA BLACK be dispatched to eastern Lake Superior, the request was denied on the grounds that a 140 must remain on Lake Erie to provide SAR capability. We disagreed with the decision, noting there was a 140 in Detroit that could have responded to a SAR mission, but the BLACK remained in Port Colborne until the last Canadian lakers had cleared. Then, and only then, was the vessel dispatched to Whitefish Bay. The ice conditions on eastern Lake Erie did not require the BLACK's presence. There had been considerable rain and the ice was rotting. The bottleneck was eastern Lake Superior, not eastern Lake Erie.

9. **The closure of the Soo Locks does not mean commercial navigation has ceased above the locks.** Once the Soo Locks closed this January, Sector Soo stated there was no icebreaking asset available above the locks. However, shipments of iron ore from Marquette, Michigan, to Essar Steel in Sault Ste. Marie, Ontario, often continue after the locks close. Granted, this January no post-January 15 ore moved to Essar, but the past five Januaries have in total seen 14 cargos totaling 257,000 tons shipped from Marquette to the Sault Ste. Marie.

10. **Convoys must be maximized, both in terms of number of vessels, and vessel capabilities.** For reasons unknown to us, both Coast Guards have reduced the numbers of vessels they will take in a convoy. Convoys of 5-6 vessels used to be the norm, now they are the exception. For example, when the a 1,000-footer arrived at buoys 11 and 12 on January 13 of this year, Sarnia Traffic ordered the vessel to go to anchor and let other vessels in front of them be convoyed. The first downbound convoy consisted of two vessels, as did the second. Our records are incomplete, but it appears the third downbound convoy again consisted of just two vessels. An upbound convoy was then formed and it initially consisted of three vessels, but two small tug/barge liquid-bulk units were then added and one became beset just above Algonac for more than a day, and by now, a number of downbounders were anchored above buoys 11 and 12. Finally on the 16th (three days after arrival), the 1,000-footer was told to get underway, with a Canadian laker following behind. The footer's mass and speed broke free the tug/barge that had been beset above Algonac, and its 105 foot beam left a track that should have

allowed the tug/barge to get underway, but the vessel was told to hold its position. A perfect opportunity was lost.

11. **We are concerned the Coast Guards do not fully appreciate the knowledge and skills of our Masters.** We are aware of situations where the Coast Guards did not allow a vessel to get underway even though the Captain was confident he could proceed. A case in point again involves a 1,000-footer. The vessel finished unloading in Detroit early on January 17. Since there were vessel anchored below Belle Isle and Ojibway, the vessel tied up at the at a fuel dock. While there the Captain made repeated calls to Sarnia Traffic asking for permission to get underway. The Captain stressed the vessel had suffered no delays on its downbound transit and did not anticipate any problem returning north. Nonetheless, the vessel was not allowed to proceed until late on the 18th. Had the vessel been allowed to proceed, its transit likely would have freed and left a track for that tug/barge unit that had again become beset. All these delays cost the vessel its ability to winter in Duluth/Superior. Instead it was moored in Milwaukee, which meant the materials needed to perform its contracted winter maintenance had to be trucked to the new lay-up berth. Also, by not wintering in Duluth/Superior the vessel was not able to load its first cargo on March 23 and be at the locks when they opened on March 25.

12. **When working a 1,000-footer, the 140s need to widen the track.** When an eastbound 1,000-footer arrived at Lansing Shoal, a 140 was grooming the track to the bridge. However, given its narrow beam, the track was only about 40 feet wide and the approaching vessel was 105 feet wide. The footer became beset several times. The 140 came to its assistance, but once the footer was again making way, the 140 went ahead, but rather than widen the track, he stayed in the middle of the track, which meant the footer would again become stuck.

13. **It was unnecessary to impose one-way traffic above the Soo Locks this year**. In a break with the past, the 13/14 and 14/15 ice seasons have seen one-way traffic between declared between Point Louise, just below Light 26, and Big Point. The resulting delays were significant and unnecessary. The track would have held if two-way traffic was allowed as was the norm.

14. **Need better cooperation between Sector Detroit and ROC.** From where we sit, it seems the ROC dominates. Moreover, that observation could be expanded to cover the whole system. In our opinion, the Canadian Coast Guard serves its nationals first, whereas the USCG bends backwards to assist Canadian lakers, even if it's at the expense of U.S.-flag lakers. There needs to be a frank discussion among all interests about better balancing the response to the needs of commercial navigation.

15. **The value of institutional memory is immeasurable.** We recognize the rotation system is a fact of life, but Coal Shovel in particular has suffered from a lack of institutional memory. Provision must be made to insure at least some in Sector Detroit have ice season experience.

Thank you for the opportunity to comment.

Very respectfully,

James H. I. Weakley
President

Cc: Lt. Steve Kingsley, Ninth District Domestic Icebreaking Supervisor
Mark Gill, Director, VTS St. Marys River

Attachment A

Economic Impacts Resulting from 2014 Ice Delays

To estimate the economic impact of the unusually long ice season on the Great Lakes during the 2013-2014 winter season, year over year tonnage comparisons were made between December 2012-May 2013 and December 2013-May 2014. The data, showing tons by commodity, carried by the U.S.-flagged Great Lakes fleet, was supplied by the Lakes Carriers' Association. Using the *2010 Economic Impact study of the Great Lakes and St. Lawrence Seaway – U.S. Flagged Fleet*, jobs per ton and revenue per ton ratios were developed for iron ore, coal, limestone/aggregates and other dry bulks. These ratios were then applied to the net decrease in tonnages from the 2013 winter shipping season to the 2014 winter shipping season. This methodology assumes that demand for these cargoes did not change from 2013 to 2014. From December 2013 through May 2014, cargo moved by the U.S.-flagged fleet decreased by 6.8 million tons from the previous year due to lost transit days caused by heavy ice. The economic impacts of these delays are presented in terms of jobs and business revenue in Table 1.

Table 1 – Economic Impact of Lost Tonnages due to Heavy Ice

	2014 Ice-Delay Impacts
JOBS	
Direct Jobs	1,311
Induced	1,298
Indirect	1,221
Total	3,830
BUSINESS REVENUE (1,000)	$705,145

The vessel delays caused by the 2014 ice season resulted in the loss of 1,311 jobs that are directly dependent upon the U.S.-flagged fleet's ability to deliver cargo throughout the Great Lakes Region. This results in the additional loss of 1,298 induced jobs that had been supported by direct job holders as they re-spent their wages/salaries within the regional economy. Businesses that depend upon the region's maritime industry lost over $705 million in revenues because of the ice delays. As businesses use their revenue to purchase goods and services, they support indirect jobs. The decrease in revenue and corresponding decline in purchases of goods and services resulted in the loss of 1,221 indirect jobs. In total, 3,830 dependent jobs were lost due to the 2014 ice delays.

Attachment B

Economic Impacts Resulting from Decreased Tonnage During the 2015 Ice Season

To estimate the economic impact of the 2015 winter ice season on the Great Lakes, tonnage comparisons were made between the January 2015-April 2015 period and the average tonnage carried during those months from 2010-2013. Because the winter of 2014 was exceptionally severe, it was excluded from long-term average calculations so as not to skew the data. Tonnages carried by the U.S.-flagged Great Lakes fleet were provided for separate commodity groups by the Lakes Carriers' Association. Using the *2010 Economic Impact study of the Great Lakes and St. Lawrence Seaway – U.S. Flagged Fleet*, jobs per ton and revenue per ton ratios were developed for iron ore, coal, limestone/aggregates and salt. These ratios were then applied to the net decrease in tonnages of each commodity, again comparing the 2015 winter shipping season against the average tons carried during the 2010-2013 winter shipping seasons. This methodology assumes that demand for these cargoes has remained constant and that the lost tonnages correlate to lower production levels by the end users. From January 2015 through April 2015, cargo moved by the U.S.-flagged fleet decreased by 3.2 million tons from the 2010-2013 average due to lost transit days caused by heavy ice. The economic impacts of these delays are presented in terms of jobs and business revenue in Table 1.

Table 1 – Economic Impact of Lost Tonnages due to Heavy Ice

	2015 Ice-Delay Impacts
JOBS	
Direct Jobs	674
Induced	667
Indirect	628
Total	1,970
BUSINESS REVENUE (1,000)	$355,578

The vessel delays caused by the 2015 ice season resulted in the loss of 674 jobs that are directly dependent upon the U.S.-flagged fleet's ability to deliver cargo throughout the Great Lakes Region. This results in the additional loss of 667 induced jobs that had been supported by direct job holders as they re-spent their wages/salaries within the regional economy. Businesses that depend upon the region's maritime industry lost over $355 million in revenues because of the ice delays. As businesses use their revenue to purchase goods and services, they support indirect jobs. The decrease in revenue and corresponding decline in purchases of goods and services resulted in the loss of an estimated 628 indirect jobs. In total, 1,970 dependent jobs were lost due to the 2015 ice delays.