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IAATO Further Recommendations to Tourism Vessel Operators to Enhance Marine Safety, and Guidelines for Small Boat Operations in the Vicinity of Ice

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An Information Paper Submitted by IAATO

Summary

During ATCM XXXII (Baltimore, 2009), the Commissioner of Maritime Affairs, Republic of Liberia released its *Report of Investigation in the Matter of Sinking of Passenger Vessel EXPLORER (O.N. 8495) 23 November 2007 in the Bransfield Strait near the South Shetland Islands*. At that time, IAATO committed to ATCM delegates to study the report carefully to assess what specific actions and recommendations could be put in place as Industry Best Practice prior to the 2009-10 Antarctic tourism season. In addition to these actions, the IAATO Marine Committee and Field Operations Committee also drafted and approved guidelines for small boat operations in the vicinity of ice. This information paper outlines these actions and guidelines for IAATO vessel operators, which have now been implemented.

Following the publication of the Commissioner of Maritime Affairs, Republic of Liberia *Report of Investigation in the Matter of Sinking of Passenger Vessel EXPLORER (O.N. 8495) 23 November 2007 in the Bransfield Strait near the South Shetland Islands*, the IAATO Marine Committee was tasked with carefully evaluating the report, along with other information that proved useful, in order to provide further advice prior to the 2009-10 season to those members who own or operate Antarctic tourism vessels. This followed initial actions taken by the Marine Committee in February 2008, as described in ATCM XXXI IP081 *Summary Report and Outcomes of IAATO's Marine Committee Meeting on Vessel Operations, Safety and Related Issues* (Kyiv, 2008)

The resulting additional recommended actions are attached as Appendices A and B and were briefly discussed at the Antarctic Treaty Meeting of Experts on the Management of Ship-borne Tourism in the Antarctic Treaty Area, Wellington, December 2009. The recommended actions cover preventative measures to minimize the likelihood of an incident as well as actions to minimize the severity of an incident should it occur. IAATO has also submitted a separate information paper *Developing a Risk Assessment Framework for IAATO Passenger Vessels* to ATCM XXXIII which goes into additional detail regarding this initiative.

Emphasizing the importance of experience in safe operations and the importance of good bridge support, Members also approved a change in the IAATO Bylaws to strengthen the requirements for experience of bridge officers aboard IAATO-member vessels. The new phasing considers the various types of cruise experiences – i.e. the “intended operation” – offered by IAATO members, ranging from smaller expedition style vessels which make landings to larger cruise-only vessels that visit ice-free waters in the height of summer.

Also approved by the IAATO Marine and Field Operations Committee for use during the current 2009-10 tourism season were *Guidelines for Small Boat Operations in the Vicinity of Ice*, attached as Appendix C. While not directly the result of the *Explorer* incident, these guidelines nevertheless address some of the questions raised about safe small boat operations in Antarctic waters. Other aspects of these guidelines are based on a report by the Norsk Polar Institute following an incident with a passenger ship in Svalbard waters.

The additional recommended changes to the standard operating procedures of members, the Bylaw changes and the new guidelines for small boat operations, reflect IAATO's commitment to safe and environmentally responsible private-sector travel to Antarctica.

Appendix A

IAATO Actions to Enhance Marine Safety [IAATO 20th Annual Meeting, Providence, RI, June 9, 2009]

The IAATO Marine Committee proposed the following actions, which were subsequently adopted at the 20th Annual Meeting, and which were precipitated by the “Report of Investigation in the Matter of Sinking of Passenger Vessel EXPLORER (O.N. 8495) 23 November 2007 in the Bransfield Strait near the South Shetland Islands,” and other recent incidents.

Proposed Changes in Standard Operating Procedures:

1. Participation in the IAATO vessel tracking scheme with hourly reporting will be a requirement of membership for all IAATO SOLAS passenger vessels while operating in Antarctic waters by October 1, 2010.
2. Members using SOLAS passenger vessels with open lifeboats in Antarctica are strongly encouraged to refit these vessels with partially or totally enclosed lifeboats.
3. By the 2010-2011 season, IAATO members with SOLAS passenger vessels must, as far as is reasonable and practicable, comply with the Guidelines for Ships Operating in Polar Waters.

Proposed IAATO Bylaw Change:

1. IAATO Bylaws Article X Operational Procedures, Section B, bullet point 7 should be amended from:

Organizers should have a Captain, Ice Master or bridge officers with polar experience

To:

Organizers operating vessels that will travel south of 60° S. latitude must have a Captain or appointed Ice Pilot with Antarctic experience suitable for their intended operation. Depending on the intended operation, it may be necessary to have additional relevant Antarctic experience among the bridge officers.

Additional Actions:

1. Marine Committee agrees to develop by July 31st 2009 additional recommendations for IAATO member vessel operators.
2. IAATO to provide a forum – perhaps through a meeting and/or through a web-based discussion – for operators to develop guidance for member-operators to enhance or review their office Crisis Management Plans (for example, through the creation of a checklist of key factors to take into consideration). This could provide an opportunity for those members who have had an incident in Antarctica, and are willing, to share their experiences in dealing with an emergency in Antarctica.
3. The Marine Committee to continue to develop the Tiered-Risk Assessment.

Appendix B

IAATO Further Recommendations to Enhance Marine Safety [October 9, 2009]

Following further consideration of the “*Report of Investigation in the Matter of Sinking of Passenger Vessel EXPLORER (O.N. 8495) 23 November 2007 in the Bransfield Strait near the South Shetland Islands*” and related documents, the IAATO Marine Committee recommends the following actions for their vessel operators:

1. Review weather, ice and routing information services to ensure the most appropriate available information is provided in a timely manner to their vessel(s).
2. Carry out a regular review of company procedures, including emergency response, to ensure all persons involved have a clear understanding of current Antarctic requirements.
3. Operators should stay abreast of, and consider use of, continued technological developments, such as forward-looking sonar and ECDIS.
4. Ensure onboard drill schedules include regular damage control scenarios related to ice damage. Control measures should consider the implications of cold weather environments.
5. When entering the Southern Ocean, make sure that passenger and crew attention is drawn to the necessity for suitable clothing in conditions that can be severe and inhospitable. Operators of SOLAS passenger vessels also should take action to strongly encourage passengers to observe the weekly crew abandon ship drill and fire drill (see SOLAS Paragraph B Chapter III Regulation 30.2¹).

¹ **FULL TEXT OF SOLAS Paragraph B Chapter III Regulation 30.2:** “*On Passenger ships, an abandon ship drill and fire drill shall take place weekly. The entire crew need not to be involved in every drill, but each crew member must participate in an abandon ship drill and a fire drill each month as required by regulation 19.3.2. Passengers shall be strongly encouraged to attend these drills*”.

Appendix C

Guidelines for Small Boat Operations in the Vicinity of Ice

Ice is one of the most impressive sights in polar regions. A first-hand experience of pack ice, icebergs and tidewater glaciers is something that few visitors will ever forget, and can provide a useful mechanism for explaining the driving forces of the unique natural environment of polar regions. Ice can also be an important element of wildlife viewing.

However, operating small boats in the vicinity of ice poses potentially serious risks and, as such, requires skill and alertness on the part of the driver. The following guidelines are intended to assist drivers and help enable them to make good risk assessments with respect to operating in the vicinity of ice. Every encounter with ice is different, making alertness and respect for ice a critical component of being a competent polar small boat operator.

These guidelines are primarily intended for operations with small boats using outboard engines. However, similar guidelines should be followed by other small boat operations including, for example, kayaks and canoes, taking into account the characteristics of each individual operation.

Sea Ice, Pack Ice & Brash Ice

- Pack ice can move very quickly, and can trap small boats.
- When operating among sea ice or icebergs, always be vigilant to local sea and wind currents. Be alert to ice movement in relation to your operation and how it may affect both boat and shore operations.
- If taking small boats along the edge of the pack ice, keep the pack ice down wind of your operation and make sure you have a clear exit out at all times.
- Small boats can drive through brash ice at low and controlled speeds. Always try to pick a route that avoids large pieces of ice that may damage the boats or get stuck under the keel, limiting the boat's ability to maneuver.

Icebergs & Bergy Bits

- Icebergs and bergy bits are unpredictable and dangerous – even grounded bergs. Extreme caution should be used when approaching or doing “iceberg tours.”
- An iceberg should never be approached closer than two times the height of the berg above water. Even then, extreme caution should be used.
- Remember that a drifting iceberg will have localized currents around it that may affect your boat's actual course.
- Do not enter an “ice pool” and avoid driving over an ice foot. While they look very inviting, they are potentially extremely dangerous should the berg roll and either leave the boat high above the water or suck it under the berg.
- Never drive through an ice tunnel or under any ice as it can collapse. Engine vibrations may affect the stability of the ice. Remember, a cubic meter of ice weighs one metric ton and an ice fall near a boat is sufficient to cause real damage, potentially even flipping or sinking a small boat.
- Be aware that grounded icebergs will experience a gravitational change with tidal variation. This makes them more unpredictable to calving or breaking up.
- Always leave the engine running to enable a fast exit if needed.
- Do not forget that icebergs extend further underwater than is visible from the surface. If an iceberg breaks up and rolls, ice can appear several tens of meters from the original site of the berg. If you see a berg start to roll drive away from it as quickly as possible.

- Be aware that a collapsing iceberg can cause a huge breaking wave. Be prepared: if time allows drive away from the wave before turning the boat to face the wave making sure the boat and passengers onboard are prepared to ride a wave out.

Tidewater Glaciers²

- Tidewater glaciers are very unpredictable and calving is a random process. It is impossible to predict precisely when calving may occur, how large a block will be created, or how it will enter the water.
- Using calving cliff height as an estimator for the minimum safe distance is inadequate since the hinge point can lie beneath the waterline. In addition, tidewater glaciers can also calve underwater, creating “torpedoes” of ice to appear unexpectedly. There is little or no warning of these events.
- Waves that are created closest to the block, in the so-called splash zone, are very large, unpredictable, and dangerous, particularly for small boats. The minimum safe distance for avoiding direct hits from ice blocks needs to be larger to ensure that vessels are outside of the splash zone.
- Small boats cruising in the vicinity of tidewater glaciers should keep **at least** 200 meters from tidewater glaciers to avoid both direct hits and the largest waves.
- Try to stay in clear water to assure good maneuverability. Also, floating, rolling ice with waves can be extremely dangerous.
- The 200-meter distance should be increased in narrow fjords, in shallow fjords, or locations with ice cliffs higher than 40-50 meters.
- Always keep the engine running and be prepared to move away quickly.
- As waves become grounded, either in shallow water or on shore, tsunami waves are created (e.g. at Neko Harbour). Small boats should not land on shores near the edge of calving cliff faces, but further around the coastline from the glacier. Even then, implications of tsunami waves should be taken into consideration when securing boats, selecting landing sites and ensuring safety.

Examples of consequences of ice cliff calving:

<http://www.youtube.com/watch?v=HbUIRELqowg>.

<http://www.youtube.com/watch?v=aDJizpbNZvw>

² These guidelines are based on a report by the Norsk Polarinstitutt on “How close should boats come to the fronts of Svalbard’s calving glaciers?”