# HAZARDS AND RISKS OF ARCTIC SHIPPING & IMPLEMENTATION OF THE POLAR CODE

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LIBERIAN REGISTRY

# Agenda

1. Antarctic sinking, investigation and lessons learned from the passenger vessel Explorer
2. IMO's Polar Code: risks intended to be mitigated and implementation requirements
3. Projected growth of Arctic shipping in the upcoming 10-20+ years
4. Known but unmitigated risks and hazards including uncharted waters and lack of SAR/pollution response capabilities
5. Suggestions for vessels planning voyages in the Arctic
6. Conclusion

# Cruise Ship Accident in Antarctica - 2007

CNN video showing the sinking of MS EXPLORER

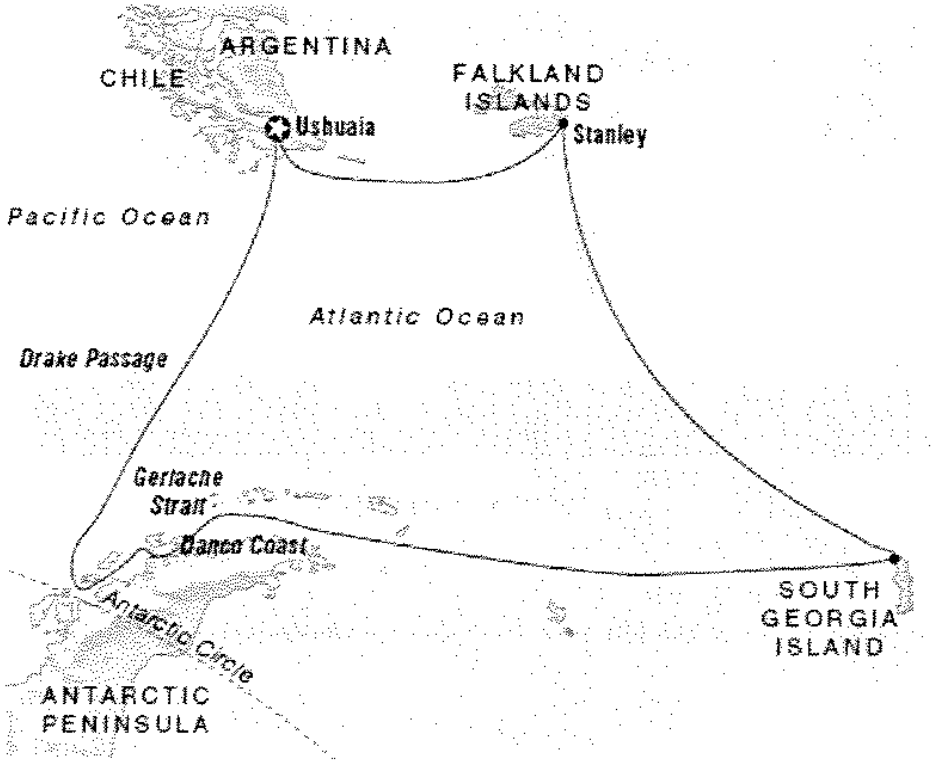
https://www.youtube.com/watch?v=r2cfYYIbRNA

# MS Explorer

- 250+ prior trips in Antarctic region.
- 54 crewmembers and 100 passengers onboard.
- Carrying 210 m3 of oil, lubricants and petrol.

# The Route

- Starting point was Ushuaia, Argentina.
- Scheduled for an 18 day trip.
- The vessel successful passed Falkland Islands and South Georgia Islands.



# The Accident

- On Nov. 22, 2007, at 2200, the vessel entered an icefield; around midnight she collided with a “wall of ice”.
- Due to a hull breach on the starboard side, the vessel began to take on water.
- At 0235 on Nov. 23rd the master decided to abandon the ship.
- Vessels who aided were NORDNORGE and ENDEAVOUR; no casualties or major injuries.
- By 1530 on Nov. 23rd the vessel had sank.
- A sheen of oil 2.5 km2 was observed.

# Liberian Administration Investigation

- Overconfidence of new Master on his 1st trip navigating in the Antarctic region.
- Master was unfamiliar with Antarctic ice (all previous polar experience was in the Arctic).
- Had the Master had training for the ice conditions in the Antarctic region he likely would have taken action to avoid striking the hard ice that sunk the ship.
- The crew and passengers were not adequately prepared for the evacuation and would have been endangered if the sea conditions were more severe and other ships had not been in the vicinity.
- The vessel met the minimum shell plating thickness requirements in place at the time of her construction in 1969, but this wasn't sufficient for ice classed vessels at the current standards.

# Recommendations

- Specific training for ice navigators.
- Immersion suits for all passengers.
- Vessels in polar regions should have partially or totally enclosed lifeboats.
- Update of current standards regarding minimum deck and shell plating thickness.

All in all, the EXPLORER was the real kick-off of the Polar Code.

# The Polar Code


- The Code enters into force on January 1, 2017.
- Polar waters are defined as those north or south of 60 degrees in each hemisphere (Arctic and Antarctic), with some variations for waters around Norway, Iceland and Greenland.
- Polar Code is intended to cover ship design, construction and equipment; operational and training concerns; search and rescue; and the protection of the unique environment and eco-systems of the polar region.
- The Code is implemented through amendments to: Safety of Life at Sea (SOLAS), Prevention of Pollution from ships (MARPOL) and Standards of Training, Certification and Watchkeeping for Seafarers (STCW).

# Geographical Demarcation of the Arctic

# Polar Code Requirements - 1

- **Polar Ship Certificate** to classify the vessel depending on anticipated ice conditions, along with a survey by either flag State or class society that would identify operational limitations based on ship structure and stability rules that classifies ships into different categories (A, B or C) depending on the types of ice and conditions to which the ship will be exposed.

- **Polar Water Operational Manual** showing the ship's procedures to follow in normal operations, in the event of incidents, when conditions are encountered that exceeds the ship's capabilities, and when icebreaker assistance is needed. It should also include voyage planning, and risk based procedures for search and rescue (SAR) and spill response.

- **Lifesaving appliances and arrangements** require escape routes to remain accessible and safe taking into account potential icing and snow accumulation, thermal protection for all persons onboard and an immersion suit or thermal protection aid for each person onboard a passenger ship, partially or totally enclosed lifeboats, special tools for ice removal, and fire extinguishers operable in cold temperatures and for persons wearing bulky cold weather gear.

# Polar Code Requirements - 2

- **Navigation and communication equipment** must be able to meet ice and high latitude limitations, and receive information about ice conditions.

- Special basic and advanced **training requirements** for masters, chief mates and navigation officers to attain the abilities needed to fulfill their duties and responsibilities in polar waters.

- **Pollution prevention measures** prohibit the discharge of any oil, oily mixtures, ballast water, noxious liquid substances, sewage (with limited exceptions), and garbage (except for food waste and cargo residues under strict conditions).

# Projected Growth in the Arctic

- The ***Arctic Council*** predicts increased summer marine traffic for scientific exploration and tourism, fishing and trans-Arctic voyages in the future. Yet voyages through 2020 are expected to be regional for natural resource development, tourism and import of goods— rather than trans-Arctic voyages.

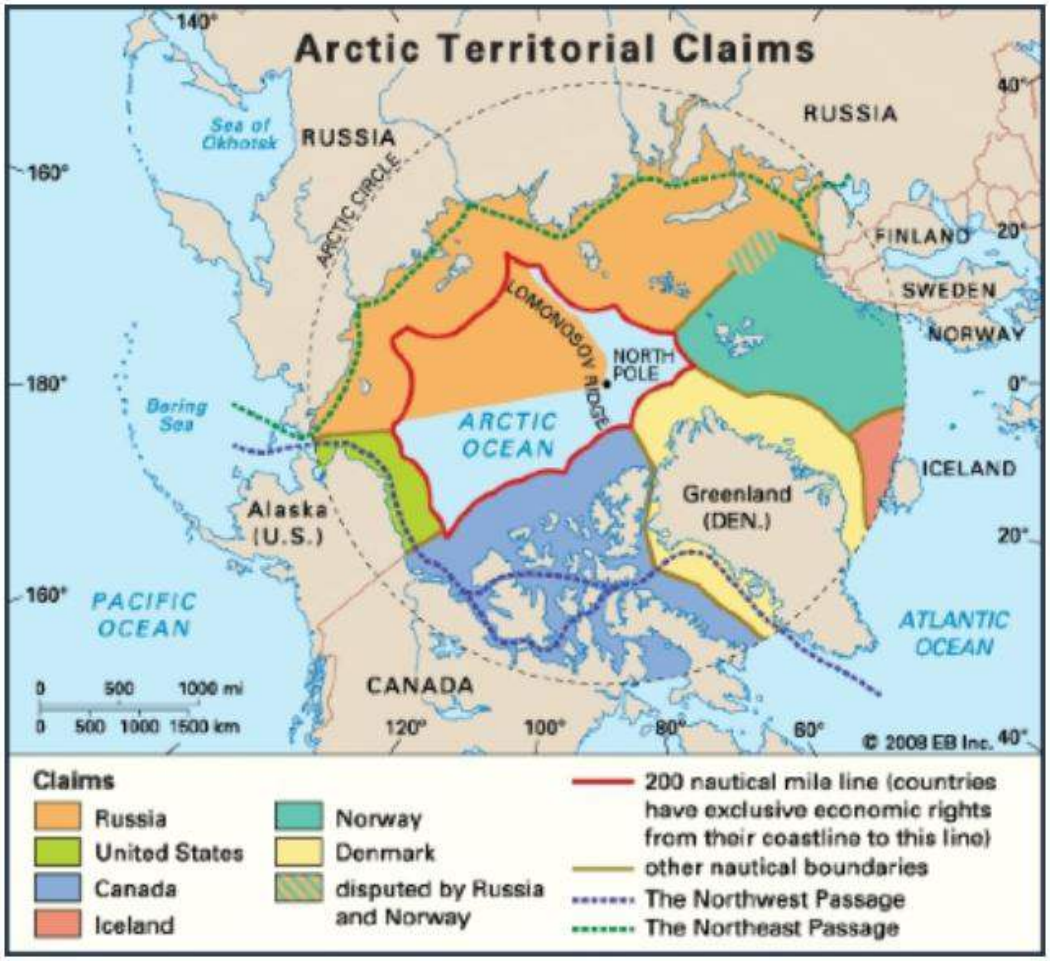
- The ***U.S. Committee on the Marine Transportation System*** produced a report stating, "a conservative estimate of the number of unique vessels operating in the Bering Strait and U.S. Arctic in 2025 is 420, resulting in approximately 877 transits through the Bering Strait, or an increase of 100% over current transit levels." In the high growth scenario, the 1262 ships and 2637 transits would equate to about 500% growth.

- In April 2016, ***China's Maritime Safety Administration*** released a guide to encourage Chinese flagged ships to take the Northwest Passage to cut travel times and distances.

- A study by researchers at the ***National Oceanography Centre*** in Southampton and the ***Nansen Environmental and Remote Sensing Center*** in Bergen found that "unescorted navigation in the high Arctic in summer may be possible as early as the 2030-2040s and is probable after 2050."

It's clear Arctic shipping is growing and will continue to grow over the next couple of decades, which will produce both opportunities and challenges.

# Projected Growth in the Arctic




*A map of overlapping territorial claims in the Arctic (Encyclopedia Britannica)*

# Known but Unmitigated Risks & Hazards - 1

- **Search and Rescue (SAR) emergency response** is particularly challenging in the Arctic because of the remoteness and great distances involved in responding, the impacts of the harsh environment on response personnel and equipment, and lack of shoreside infrastructure and communications.


- More than 99% of **Arctic waters are uncharted –** Rear Admiral Gerd Glang, Director of the NOAA Office of Coast Survey, estimates it would take over 100 years to chart Alaska's Arctic coastline.

- **Environmental risks –** Similarly to lack and limitability of SAR resources, there is very limited (if any) pollution prevention equipment that can quickly appear in the case of a ship grounding, sinking or other case of pollution discharge.

# Known but Unmitigated Risks & Hazards - 2

**CASE STUDY**

April 2009 cruise ship mass rescue operation in Ketchikan, Alaska:
Holland America Line & USCG

Two major findings were:

1. It would be nearly impossible to stage and lodge 3,000 to 4,000 people in a city of 8,000 residents. Every hotel room would exceed capacity and people would need to stay not only in every resident's home, but the crew and some younger guests would need to sleep on the floor of every school and public building.

2. Most importantly, it would take over a week—operating Ketchikan's airport at maximum capacity and chartering all available commercial planes—to repatriate all passengers and crew back to Seattle where further arrangements could be made.

# Known but Unmitigated Hazards - 3

The Arctic Council understands these unmitigated risks and is working to mitigate them through two agreements:

1. Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic

2. Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic

While in one case it may be easy to mount a response off the coast of Norway, which is fairly established in Arctic shipping and has nearby population bases—incidents off the coasts of Canada and Alaska would be much more difficult to administer, even with all Arctic Council governments contributing resources.

# Suggestions for Vessels Planning Voyages in the Arctic

- Ships traveling together, especially passenger ships, have a better chance of rescuing each other if there is another ship of similar size and capacities. Having two other nearby passenger ships is what saved the lives and prevented any major injury to the Explorer's 154.

- Keeping to established or as close to established shipping routes would protect vessels from uncharted hazards lying below ice and unknown waters.

- Risk of environmental pollution and long-term damage will continue to be a concern until such time that pollution response capabilities can be built all along the Arctic routes. Again, ships traveling together can share pollution prevention resources; but reporting a spill to the nearest coastal state immediately can prompt quicker response from the Arctic Council member states.

# Conclusions

- Today is an exciting time for Arctic shipping—the future holds many opportunities and advantages for vessels interested in cutting down their travel time and distance, and for opening up fishing, oil, gas, and mineral exploration. With the growing market of adventure tourism and passenger vessel voyages, the Arctic will soon become a popular destination.

- By adopting the Polar Code, the IMO mitigated some of the risks associated with Arctic shipping and provided clear guidelines to protect ships, seafarers and the environment.

**Sunken Antarctic cruise ship left oil spill**

Mile-long slick is near breeding grounds for 2,500 penguins


- Although there are still a great deal of unmitigated risks associated with uncharted waters, and lack of SAR and pollution response capabilities—these can be overcome in the short-term with some basic risk management techniques. In the long-term, the Arctic Council member states, along with public-private partnerships, will build and maintain the necessary SAR and pollution response stations as demand for Arctic shipping grows.

# Thank You!

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http://www.offshoreinvestment.com/pages/index.asp?title=Hazards_and_Risks_of_Arctic_Shipping&catID=14381