POLAR SHORTCUTS

As ice melts, shippers plan for Arctic routes

As the polar ice cap thins and recedes, ship owners eye a trek through the Arctic as a means to slash fuel costs, emissions and time in transit. Though Arctic ship traffic is increasing, significant logistical, technical and political hurdles remain before the promise of the Northern Sea Route significantly impacts global shipping patterns.

• by Gregory R. Trauthwein

With the thinning polar ice cap creating more navigable routes than ever before, ship owners are carefully weighing the financial rewards versus the technical, logistical, legal and political risks of shipping via the shorter Northern Sea Route (NSR).

"This is an extremely dynamic issue, but the main point is the time savings, which equates to saving in bunker fuels and charter hire," said Felix H. Tschudi, chairman and fourth-generation owner of the Tschudi Group of Oslo, Norway, which specializes in shipping, offshore and logistics services. Tschudi also is chairman of the Center for High North Logistics, a nonprofit research foundation focused on transportation solutions in the Arctic.

RISK & REWARD

Though the savings in time, fuel and emissions are substantial, Arctic routes come with added risk.

"Ice itself is still a risk," said Mikko Niini, former CEO and now an adviser to Aker Arctic of Helsinki, Finland, which operates the world's only privately owned ice-testing facility for shipping. "It is a technical risk for the hull and the machinery. And while everyone talks about the polar melt, the area open for shipping is short already."

> *"ICE IS A TECHNICAL RISK FOR THE HULL AND THE MACHINERY. WHILE EVERYONE TALKS ABOUT THE POLAR MELT, THE AREA OPEN FOR SHIPPING IS SHORT ALREADY."*
>
> **MIKKO NIINI**
> *ADVISER, AKER ARCTIC*

In addition to ice, Arctic shippers must plan for the region's lack of infrastructure, including port facilities and emergency response and remediation. Poor satellite coverage complicates communications and contributes to limited meteorological data. A lack of detailed ocean charts for the region, coupled with frequently dense fog, makes navigation difficult. Cold weather and long polar days can disrupt sleep, increasing the risk of human error.

Ships reinforced against ice damage also can cost 50% more than similarly sized commercial ships built for non-Arctic routes. "The ice cover has been reduced radically, but this could simply be a cycle, and it could turn again," Niini said. The extra weight of ships designed for the Arctic makes them uneconomical for other routes, so re-freezing could render them useless.

"At the end of the day, it really comes down to dollars per ton delivered," Tschudi said. "The relative savings of using the NSR depend on the overall health of the freight market." For high-value cargoes in high-freight markets such as liquefied natural gas (LNG), the additional cost of ice-reinforced vessels makes sense, Tschudi said. For the low-rate bulk carrier sector, the economics of risking an Arctic route are less compelling.

ATOMFLOT GUIDES THE WAY

One proven way for shippers to mitigate Arctic risks is to partner with Atomflot, the Russian icebreaking and escort authority.

Red lines indicate the Northern Sea Route, visibly shorter than traditional routes (blue lines) used to move cargo from Asia Pacific to northern Europe. (Image © Tschudi Shipping Company AS)

Tschudi considers Atomflot an indispensable resource. "The icebreaking capacity is not the main thing; for me it is the escort service," he said. "They can tow, they have a hospital, and if there is any mechanical failure you have them nearby to assist. My best advice: Listen to the advice of Atomflot and the Northern Sea Route Administration. It is also a good idea to have a Russian-speaking ice pilot onboard to facilitate communications."

Niini concurs. "It is a safety escort, and they have fees on these operations," he said. "If you're bold you could do it outside of the Russian influence. But typically, anyone who has used this passage will go through the Russian route."

COLLABORATION AND CAUTION

The diverse and dynamic nature of the Arctic dictates caution and collaboration. "I would make investments that would give you opportunity to go there, but not necessarily a very large fleet," Niini said. "From the technical side, everything goes more safely and efficiently when you go step-by-step."

Tschudi believes that one key to long-term success of the route will be to identify and secure cargoes. "If you could identify cargoes that could generate freight income on the return leg to Europe, this would make the route almost unbeatable," he said.

Collaboration will become crucial as national, corporate and scientific interests collide. Paul Arthur Berkman, Fulbright Distinguished Scholar and research professor in the Bren School of Environmental Science and Management at the University of California, Santa Barbara (UCSB), contends that the challenges are too large for any one entity to manage.

"The solutions for safe ship operations will involve public-private partnerships, as the solutions are beyond the governments themselves to implement in isolation," Berkman said. "It will include many elements, such as the International Maritime Organization's Polar Code, training and certification of the seafarers, the insurance industry, companies with fleets to operate effectively in the Arctic, classification societies and state responses."

His colleague at UCSB, Oran Young, is a renowned Arctic expert and a leader in the fields of international governance and environmental institutions. "My sense is that we are beyond the visionary stage," Young said. "We are now moving into the stage of realism where you start thinking of the concrete, substantive bottom-line types of considerations," including the need for return cargo, new ship designs, and research into insurance issues.

"There are estimates that global ship traffic will triple in the next 10 years," Berkman said. "Proportionately, what is the increase in the Arctic? If we know that, we can begin to model what it might look like, which then translates into the infrastructure needed to support that increased traffic. We are really just at the beginning of this journey, and it will take a collective response to envision what this infrastructure for all of these commercial operations will look like across the 21st century." ◆

Gregory R. Trauthwein is editor and associate publisher of Maritime Reporter & Engineering News *(www.marinelink.com) and has covered the global maritime market for more than 20 years.*

Scan to see change in Arctic routes

Image © DNV GL

CREATING THE POLAR CODE

While commercial activities in the Arctic continue to increase at a brisk pace, the Arctic and its future have come to the forefront of the International Maritime Organization (IMO), the specialized United Nations agency responsible for safety and security of shipping and the prevention of marine pollution in the region. IMO is developing a Polar Code to cover a wide range of design, construction, equipment, operational, training, search-and-rescue and environmental protection issues relevant to ships operating in polar waters. To date, the IMO has agreed to draft codes for safety and pollution-prevention treaties, as well as chapters relating to training and manning, fire protection, safety and life-saving appliances, and is working with other UN committees to implement them.

THE COST OF ARCTIC SHIPS

Commercial ships are long-term investments, expected to operate 25 years or more, and costly to maintain. Ships built to withstand the Arctic's rigors cost more still, with a heavier ship and higher fuel costs.

One of the most significant shipbuilding projects to support Arctic-route operations is Daewoo Shipbuilding and Marine Engineering's construction of sixteen 300-meter (984 feet) Arctic LNG carriers with a capacity of 170,000 cubic meters (6 million cubic feet) each, being built in South Korea for operation beginning in 2016. "This is a real breakthrough in Arctic commercial transportation traffic, as this is the first project on a regular commercial traffic basis," said Mikko Niini, senior adviser to Aker Arctic.

Siberia's Yamal LNG project, which is ice-bound nine months of the year, is one of the largest industrial undertakings in the Arctic, with more than 200 wells. While the final cost of the ships is confidential, professional estimates are in the region of US$300 million each, approximately 50% more than the cost of a similarly sized, standard LNG carrier. In addition to more steel and power, several key ship systems must be winterized, including protection of deck equipment, ballast-tank heating, pre-heating of equipment and in-housing insulation.