IMO ADOPTED NEW POLAR CODE
INDUSTRY VIEW ON NAVIGATION SYSTEM IMPLICATIONS

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Trends and forecasts indicate that polar shipping will grow over the coming years - a challenge for navigation systems.

Ship travel in Arctic waters is especially dangerous; nevertheless, ship traffic in polar waters has increased in recent years. The IMO has now developed new obligatory regulations under the title "Polar Code", in order to better protect ships, crews and also the polar environment in the future.

Where in the past only fishermen and explorers were to be encountered, today extensive oil- and gas production is taking place. This requires offshore supply vessels and tankers which are suitable for the Arctic. Tourism has also increased considerably in the region. Passenger ships sail close to the edges of the ice in search of adventures for the passengers. Even container ships have already undertaken Arctic voyages, always searching for shorter, more advantageous routes.

The dangers are many and varied: Ice can damage the ship’s hull, heavy layers of ice on superstructures and deck can cause the ship to capsize. Ice in the engine coolant, in fire extinguisher lines and on antennas can be dangerous. High latitude and proximity to the poles make navigation difficult; today’s sea charts with their Mercator projection are poorly suited for polar regions. Satellite communication is also limited. There is no traffic monitoring, no lighthouses or buoys, no search-and-rescue services and no service stations for repairs.

In the Polar Code there are new rules for ship construction, stability, protection against capsizing, engines, firefighting measures, as well as rescue, navigation, communication and training. The Polar Code contains requirements for training of crews, so that they can handle the special challenges. For example, a special "Ice Navigator" is required.

The Polar Code applies for waters north of 70 degrees north latitude, with the exception of the Norwegian coast, where the Gulf Stream provides for ice-free waters, and for all waters south of 60 degrees south latitude. It takes effect on January 1, 2017, for all vessels traveling in these waters. Older ships must be retrofitted by January 1, 2018.

What changes for navigation?

Because of the proximity to the magnetic poles in Arctic and Antarctic regions, the conventional magnetic compass is very unreliable. For this reason the Polar Code requires that every ship have two non-magnetic compasses which are independent of each other. Only gyro compasses can fulfill this requirement. The reason is simple: The gyro compass is unaffected by magnetism and functions completely self-sufficiently, that is independent of outside influences.

However, if one comes very close to the North Pole, even the gyro compass loses some of its accuracy. The gyro error at Spitzbergen (80 degrees N) is 2.3 degrees; at a latitude of 85 degrees north (300 nm from the pole) the error is 5.6 degrees. In the new Polar Code,
therefore, IMO requires that for travel in latitudes above 80 degrees N a satellite compass must be on hand as well.

According to the new Polar Code, ships with ice-strengthened hulls must be equipped with two echo sounders and two speed logs, whereby at least one of the logs must measure the speed over ground. This is especially important so that during travel in a convoy with icebreaker assistance, it can be recognized precisely whether the ship has stopped or is still making headway. It is sufficient when each echolot is provided with two oscillators but only one display is needed on the bridge.

The Polar Code also requires measures to prevent ice build-up on antennas. For the whip antenna of the radio equipment this is not important but it is for radar antennas. The solution is simple: The radar transmitter unit itself is installed not in the mast, but below near the bridge. In addition, the antenna motor in the mast is provided with an electrical heating element.

Regarding communication, first a radio system according to GMDSS Area A4 is needed, that is with duplication of MF/HF, Inmarsat C and VHF. In addition, a radiotelephone for the flight frequencies 121.5 and 123.1 MHz is required to enable contact with rescue planes and helicopters. Each lifeboat must have an EPIRB, a SART and a portable VHF radiotelephone; each life raft a SART and a radiotelephone.

Conclusion: Navigation in icy regions will be safer in the future due to the new Polar Code. The applicable navigation equipment for this is already available today from Raytheon Anschütz. Many ships have been traveling for generations with Anschütz compasses in the waters around Spitzbergen, in the Barents Sea, the Kara Sea and even in the Weddel Sea and Ross Sea at the South Pole.

It is interesting that the gyro compass is playing such a central role in the future of the Arctic. In fact, this is what Hermann Anschütz had in mind when he invented it 110 years ago.

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