

# Science Improving Lives

## Icebreakers Save Ships 3,000-Mile Detour

(NAPSA)—Imagine you have to drive to the next town, only there's a detour that forces you to travel through two states before you can reach your destination.

Well, if you were a ship captain, that's essentially what you would have to do if there were no icebreakers.

### Frozen All Year

Before icebreakers existed, shipping came to a standstill in winter, or else ships were forced to make large detours; for example, when traveling from Europe to Asia. The usual route from Rotterdam to Tokyo through the Suez Canal covers a distance of 13,180 miles. Via the Northwest Passage, which runs north of America to Asia, the distance is only 9,930 miles. But this latter route is frozen over virtually all year round. During this period, the only ships that can travel the route are icebreakers or tankers that have been specially fitted to break through the ice.

An icebreaker has to meet three requirements:

- The outer plating of the ship must be particularly stable so as not to be crushed by the ice masses.
- The icebreaker must have a specially shaped bow so as to be able to break through the ice. Icebreakers are very wide in proportion to their size so as to create as wide a navigation channel as possible for other ships.
- The engine power of the ship has to be able to move it reliably through the ice even under tough conditions.

### How Does An Icebreaker Move Through Frozen Waters?

The bow does not cut through the ice like a knife. Instead, the ice is forced downwards by the flat



**The bow does not cut through the ice like a knife. The icebreaker pushes itself on top of the ice and the ice breaks under its weight.**

and arched underside of the bow. In this way, the icebreaker pushes itself on top of the ice and the ice breaks under its weight. The impetus of the ship not only has to break the ice in front of it, but also keep the channel behind it wide enough for other ships to be able to pass through easily.

### Challenges To Icebreakers

The thickness and composition of the ice can vary considerably. Shallow waters also pose significant challenges to icebreakers. Overload may occur or the propeller may even be blocked. For this reason, Voith has developed a special fluid turbo coupling that prevents this type of overload. It is mounted between the electric motor and the rudder propeller and enables the ship to be continuously restarted, for example.

The fluid turbo coupling can adapt to constantly changing conditions in Arctic seas and protects the engine from overload. For the operator, crew and passengers of an icebreaker, this special coupling by Voith ensures safety, versatility and reduced costs. To learn more, visit [www.voithturbo.com](http://www.voithturbo.com).