Baltic Icebreaking A critical infrastructure in a constantly changing operational environment

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Winternavigation in Northern Baltic

Väylävirasto Trafikledsverket

- The Finnish Transport Infrastructure Agency (FTIA) is the responsible authority for safe and fluent winter navigation
- All Finnish ports freeze during normal winters. Same applies to Estonian and Northern Swedish ports.
- Icebreaking is crucial for Finnish trade, industries and stakeholders, roughly 90% of our foreign trade is transported by ships.

Winternavigation,

System view

....not only icebreaking or costs of icebreaking

Biggest influence and costs lie in the merchant shipping costs and competitiveness of foreign trade



First year ice extent variation in Baltic Sea

 Climate change trend is clear

-but variation between winters has existed hundreds of years and will continue to exist
- Harshness of an upcoming winter can not be reliably predicted



Väylävirasto Trafikledsverket

Note:

Maximum extent of ice cover in the Baltic Sea in the winters 1719/20 – 2012/3 and 15 year moving average. Source: Jouni Vainio, Finnish Meteorological Institute (updated from Seinä and Palosuo 1996; Seinä et al. 2001).



Common

challenges

and **FIN-SWE**

solutions

CHALLENGES

- Legal framework for winternavigation, international, national and FSICR (Finnish Swedish Ice Class Rules)
- IB-capacity relative to merchant vessel development in the future
 - Vessel sizes, changes in trade patterns, "Just In Time" the name of the game
 - Environmental factors, Future fuels
 - Merchant vessels independent ice-going capacity
 - Fuel costs > Merchant vessels interest to proceed independently
- Windmill parks at open sea, effect to winternavigation and icebreaking

SOLUTIONS

- State agreement, FIN-SWE co-operation
 - Common management via IBNet, "Common fleet"
- Common principles of setting restrictions and issuing exemptions based on HELCOM recommendations. Common prioritizing and KPI's
- Further development of FSICR
- Cost sharing, cooperation in planning and financing solutions for renewal of IB-fleet

Challenges of regulatory framework

- Limiting emissions of shipping, international regulatory consequences:
 - Future fuels, maturity of technology and availability of fuels, infrastructure, overall cost effect
 - Everything pro open water performance is con to performance in ice, yearly operating time in ice is always limited, owners naturally prioritize open water performance
 - Resale value not normally increased if ice lass vessel sold to open water region
- Finnish Swedish Ice-class rules performance definition
 - Power vs. thrust requirement, model basing based compliance requirements.
 - Actual propulsion systems capability to provide power/thrust at slower than "Sea Speed"
 - Rule minimum 5 knots "In broken channel, equal to vessel width". If vessel wider than IB, it in practice end up breaking ice. Historical average assistance speeds over 10 knots. Some smaller, nozzle equipped vessels can't in real ice proceed at all, though model tests show compliance.
 - Towability of modern, open water optimized merchant vessel bow forms



OFFSHORE WIND

Will come, is needed

.....but consequences to winternavigation shall be recognized and mitigated in due time

Radar navigation in ice Possible challenges with offshore wind farms





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Finland's icebreaker fleet

- Arctia Icebreaking Ltd
 - 7 A-class icebreakers
 - 1 B-class icebreaker
- Alfons Hakans A/S
 - 1 C-class icebreaker





Next icebreakers for Sweden and Finland, IB2020 for Sweden, Finland something else



Voima build 1954, Bay of Finland traffic needs, Differences in the traffic between Finnish and Swedish ports in the Bay of Bothnia

Väylävirasto

