RAUMA MARINE CONSTRUCTIONS

Rauma Marine Constructions
Comprehensive Shipyard Capability

1. Steel production facilities (15.000 tn/y)
2. Surface treatment
3. Indoor ship building facility (610 ft x 144 ft x 105 ft)
4. Hull building facility
5. Dry-dock (approx. 853 ft x 279 ft)
6. Heavy-duty loading ramp for launching
7. Outfitting quays

SECURITY up to confidential level:

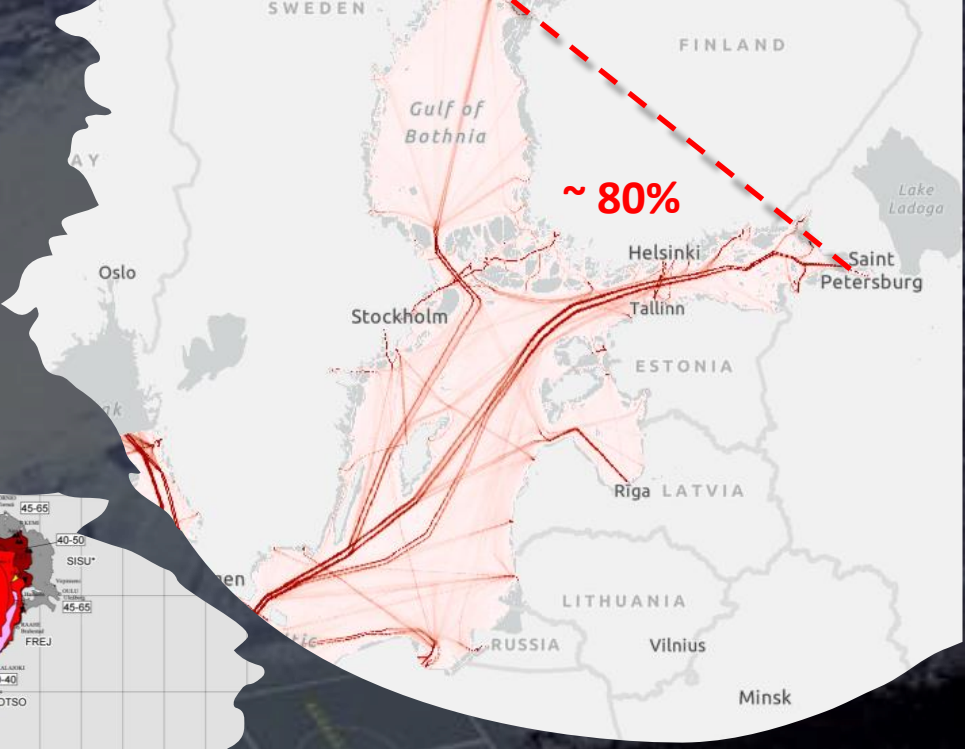
- Facility Security Clearance
- EU/NATO Security Clearance
- Business Security Clearance

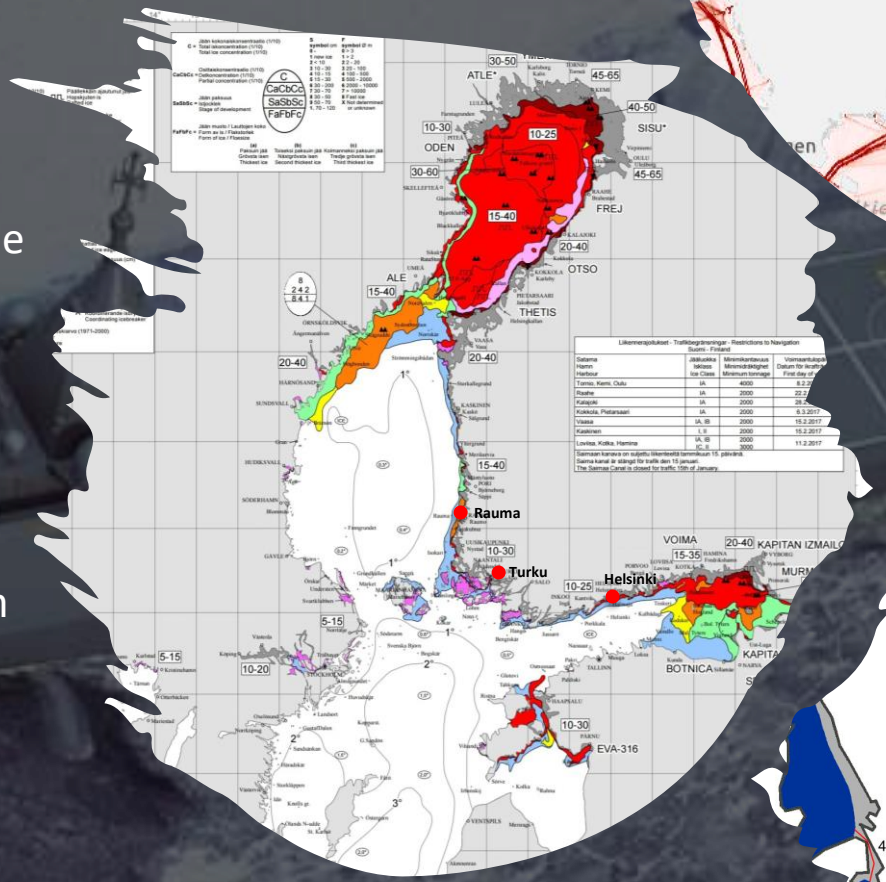
Targeted +60 m€ investments in facilities and production methods completed.

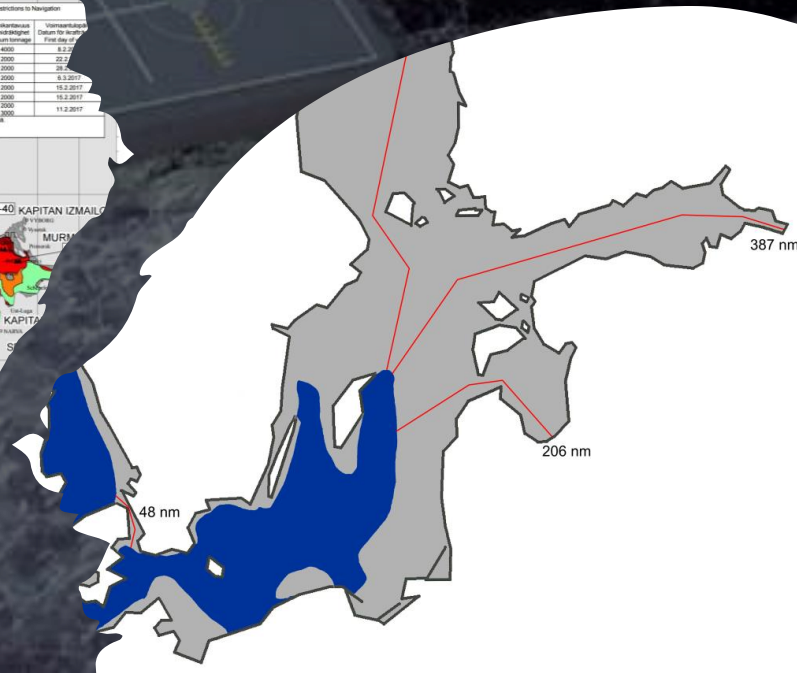
RAUMA MARINE CONSTRUCTIONS

Finland is a peninsula

- 94 % of exports and 91.1 % of imports of Finnish foreign trade pass by sea
- Peninsula thinking is further emphasized by the fact that over 80% of the population and industry is located below Vaasa Lappeenranta line
- Finland is highly dependent on functioning sealines of communication throughout the year
- Being the only country whose ports freeze in winter
- Winter navigation and the high -performance vessels required are a necessity for our nation





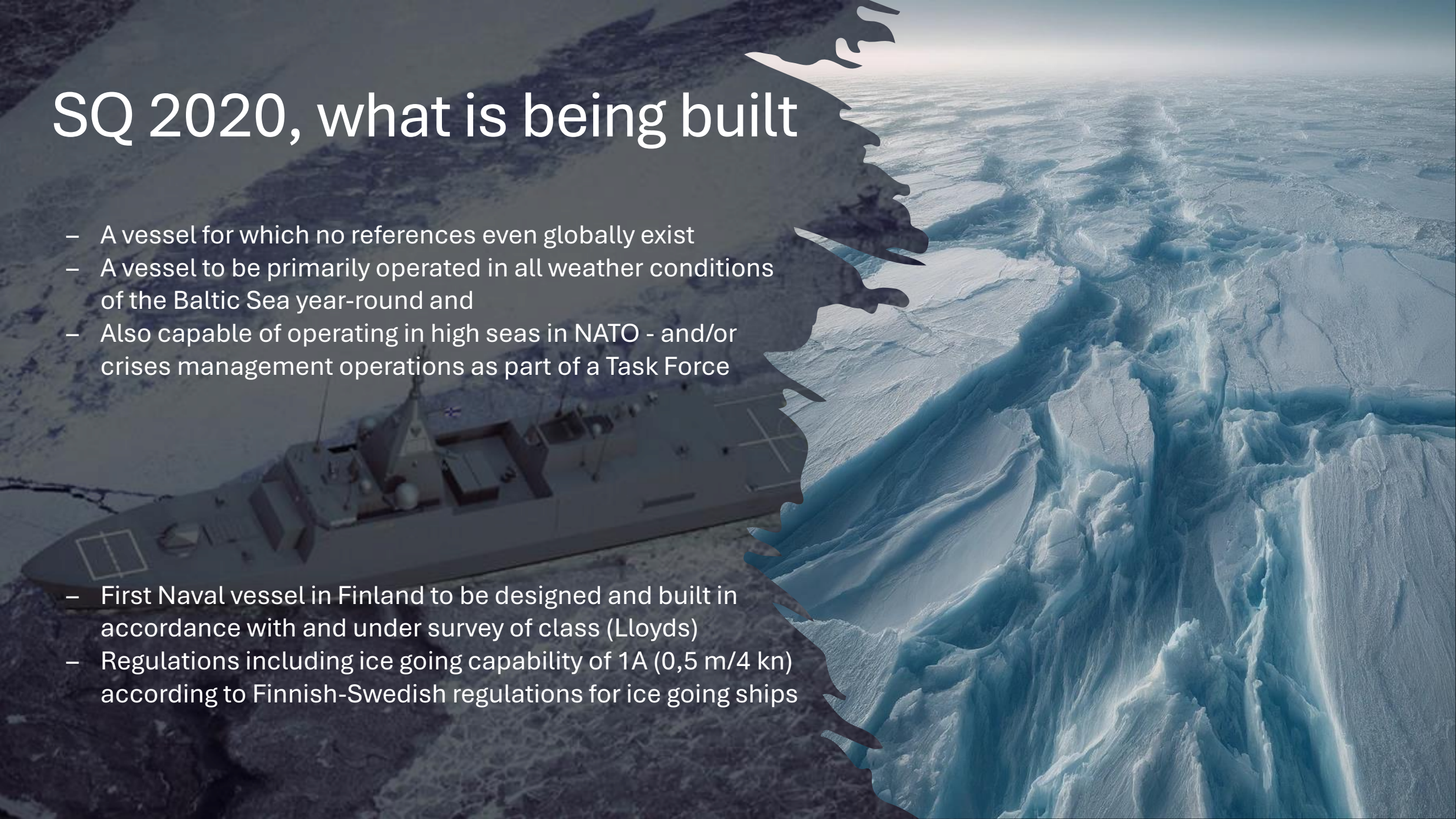


All year operational capability

- The Finnish Navy is responsible for securing and protecting Finland's sealines of communication
- In the winter the sea is ice covered for several months, which prevents or hampers navigation of non winterized vessels

- In addition to the ice coverage the annual temperature varies mainly between –30°C to +30°C

SQ 2020, what is being built



- A vessel for which no references even globally exist
- A vessel to be primarily operated in all weather conditions of the Baltic Sea year-round and
- Also capable of operating in high seas in NATO - and/or crises management operations as part of a Task Force

- First Naval vessel in Finland to be designed and built in accordance with and under survey of class (Lloyds)
- Regulations including ice going capability of 1A (0,5 m/4 kn) according to Finnish-Swedish regulations for ice going ships

Freezing Seas and Shipbuilding

- How
  - By designing, constructing, equipping or modifying a vessel to operate safely and efficiently in cold weather and ice affected waters
- To
  - Ensure safe operations in extreme cold environment and icy circumstances
  - Prevent ice accumulation affecting ship performance
  - Enhance crew safety and working conditions
  - Protect vital equipment from freezing temperatures

Structural requirements

- **Hull Strengthening:**
  - Reinforcing the ship's hull by using e.g. thicker plating and reinforced frames to withstand contacts with ice and prevent structural damage
  - Using high strength steel meeting specific ice-class certification requirements (e.g., Polar Code, IACS standards)

  - Having a strengthened ice belt as stipulated in Classification rules

- **Ice Navigation and Maneuverability:**
  - Hull form suitable both for ice going and open water operations
  - Propellers and rudders specifically designed and reinforced to withstand the harsh conditions posed by ice and for better maneuverability in ice-covered waters

- **Operational Adjustments:**
  - Ice sea chests

Outfitting & systems

- **Protection of Piping and Systems:**
  - Heat tracing and insulation to protect water systems from freezing where necessary
  - Winterized lubricants and coolants designed for low-temperature operations

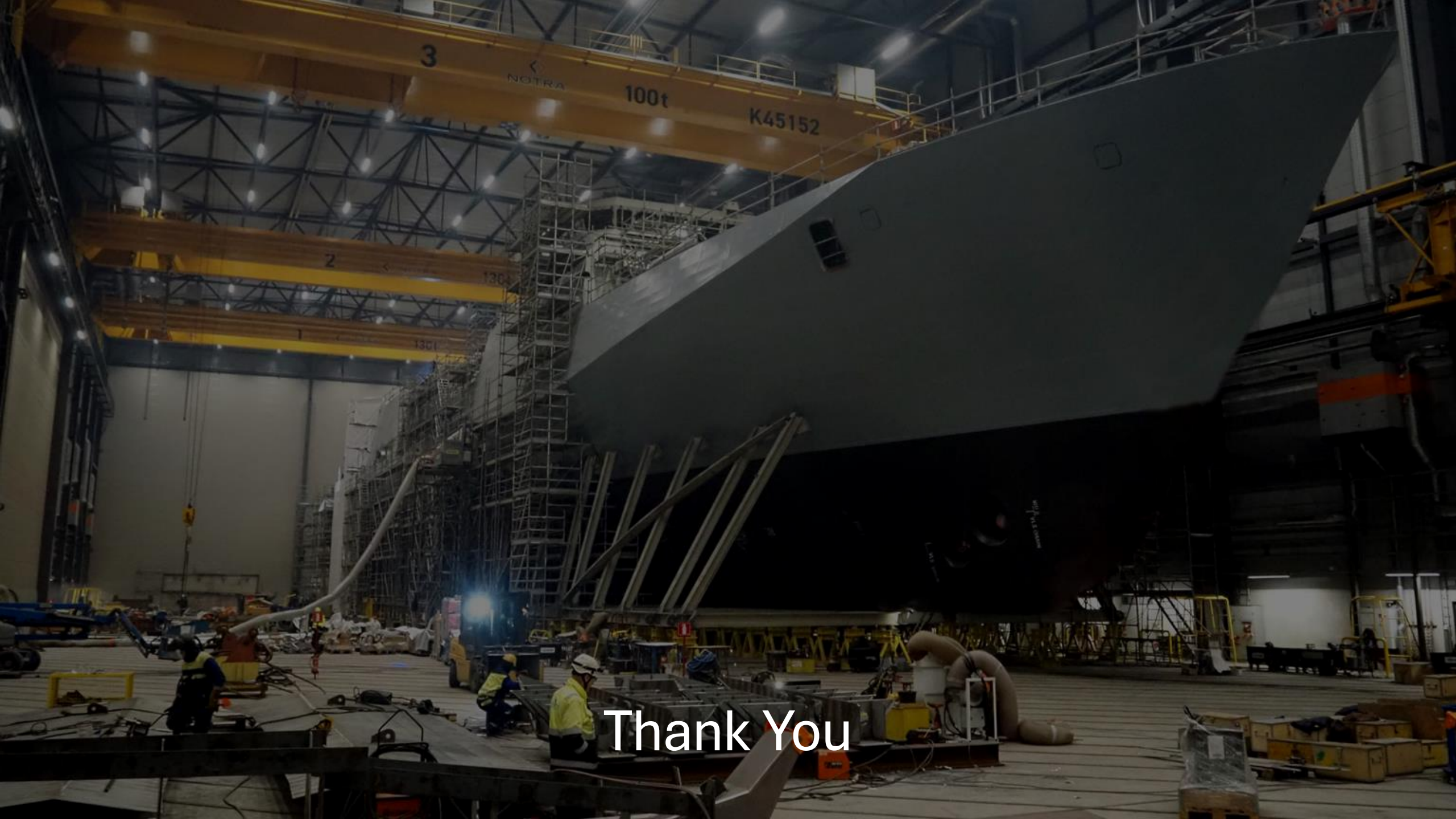
- **Ventilation and Exhaust Systems:**
  - Demisters with heating coils preventing ice buildup and freezing in ventilation intakes and ducts
  - Special cowls and deflectors to avoid snow and ice accumulation

- **De-Icing and Anti-Icing Systems:**
  - De-icing system for designated deck access ways, escape routes and working areas to prevent ice buildup
  - Heated gaskets in doors and hatches
  - Ensuring deck machinery, such as winches and cranes, remain operational in freezing conditions (taken into account in procurement requirements)
  - Thermal insulation of all critical functional spaces and effective condense water handling system
  - Ice loading monitoring system to improve hull stress monitoring and operational safety and reduce lifetime maintenance costs

- **Insulation and Heating:**
  - Installing reliable heating systems for crew comfort and equipment protection

Operational

- **Crew Safety Measures:**
  - Heated decks and anti slip materials
  - Ensuring lifeboats, life rafts, and escape routes are winterized to remain accessible and functional in icy conditions
- **Training and education:**
  - Ice operation training for operating crew in simulators
  - "*Winter navigation and operating in winter conditions require special skills Training in icy weather is essential to maintain combat capacity*" COS Coastal Fleet
  - Experience and common sense is everything
- **Functional restrictions outlined in the technical specification**



Thank You