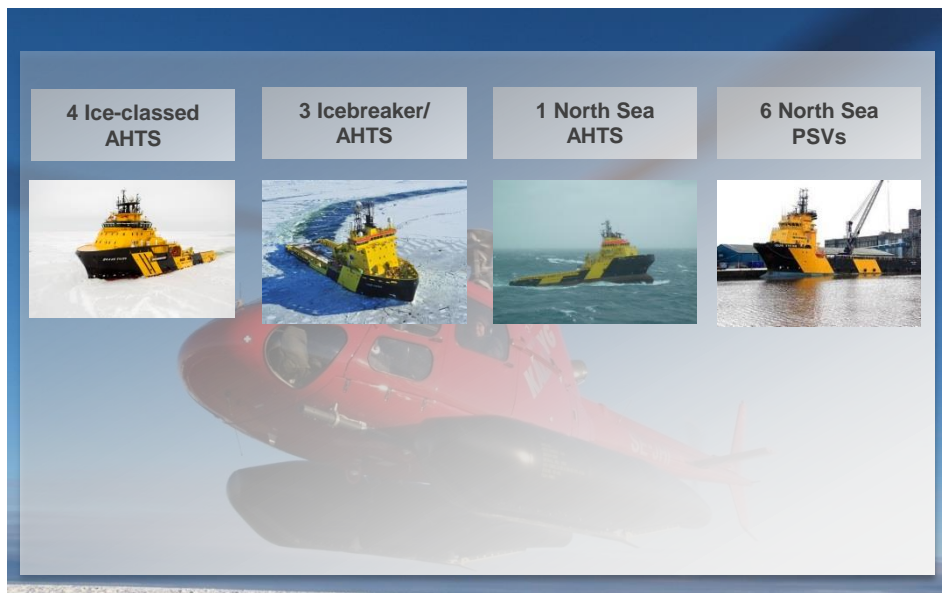


Logistical challenges for operations in arctic regions

Kaptein Finn Jørgensen



Viking Supply Ships in short



Kistefos

Christen Sveaas has through his fully owned investment company, Kistefos, been a majority owner of Viking Supply Ships (through Transatlantic) since 1989. Kistefos have a long term investment strategy for the OSV business.



VSS quick facts

- Viking Supply Ships is owned by the Swedish company Rederi AB Transatlantic
- Rederi AB Transatlantic is listed at the Stockholm Stock Exchange
- Headquarter in Copenhagen, Denmark
- Shore staff is about 60, offshore staff of about 550
- Total fleet value of NOK 4 billion

Our history

1946

The predecessor of Viking Supply Ships, Excelsior is established in Kristiansand, and later changes it's name to Bendt Rasmussens Rederi

1974

Excelsior leaves the tanker market, and moves into the fast-growing offshore market for supply vessels. Viking Supply Ships was established as a marketing organization

1998

Viking Supply Ships order three combined AHTS/Icebreakers in a joint venture with the Swedish company Rederi AB Transatlantic

2010-2012

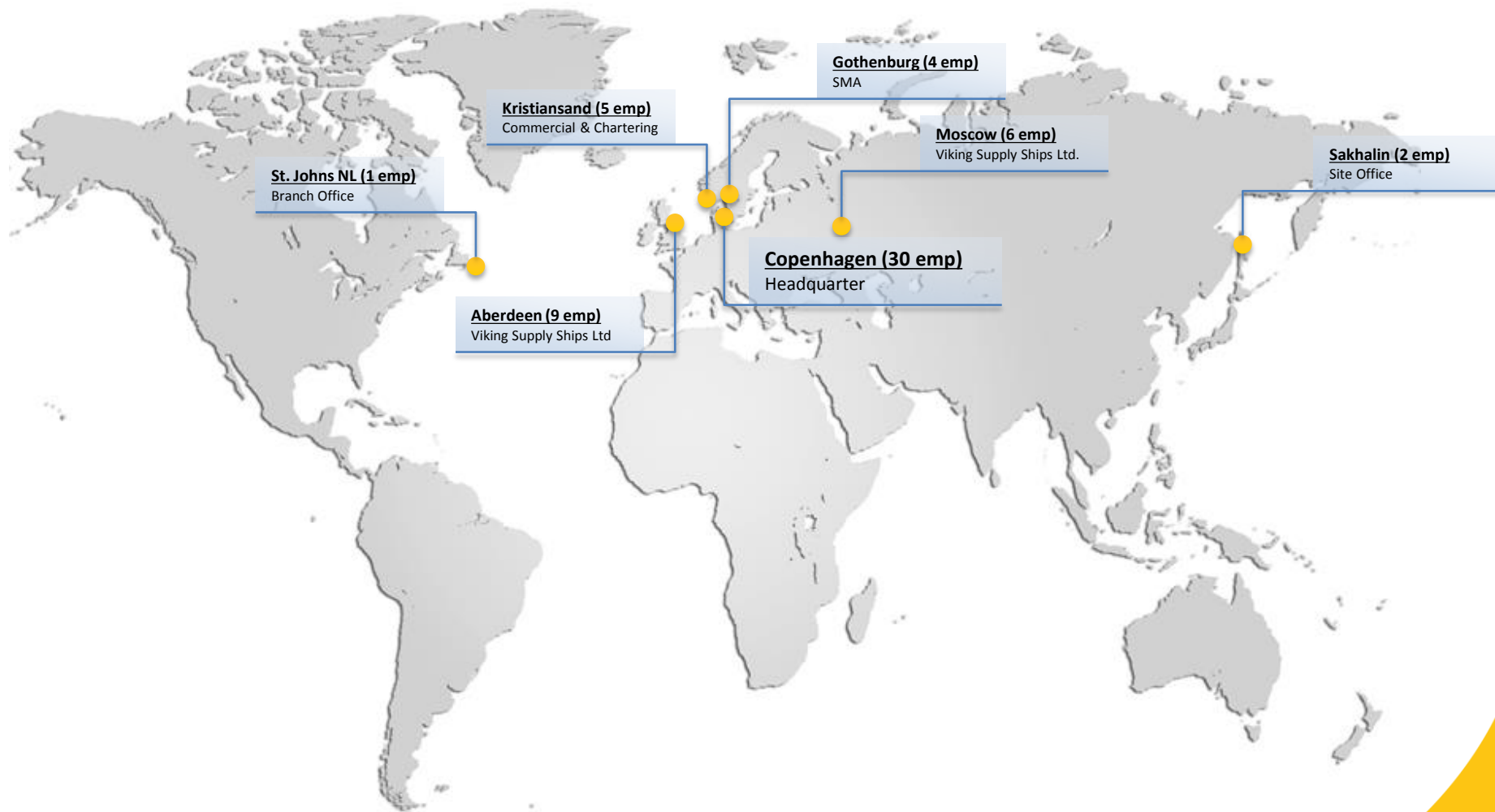
Viking Supply Ships takes delivery of four ice-classed VS-4622CS AHTS vessels from Zamakona ship yard in Spain

2011




















Viking Supply Ships A/S establish it's headquarters in Copenhagen, Denmark



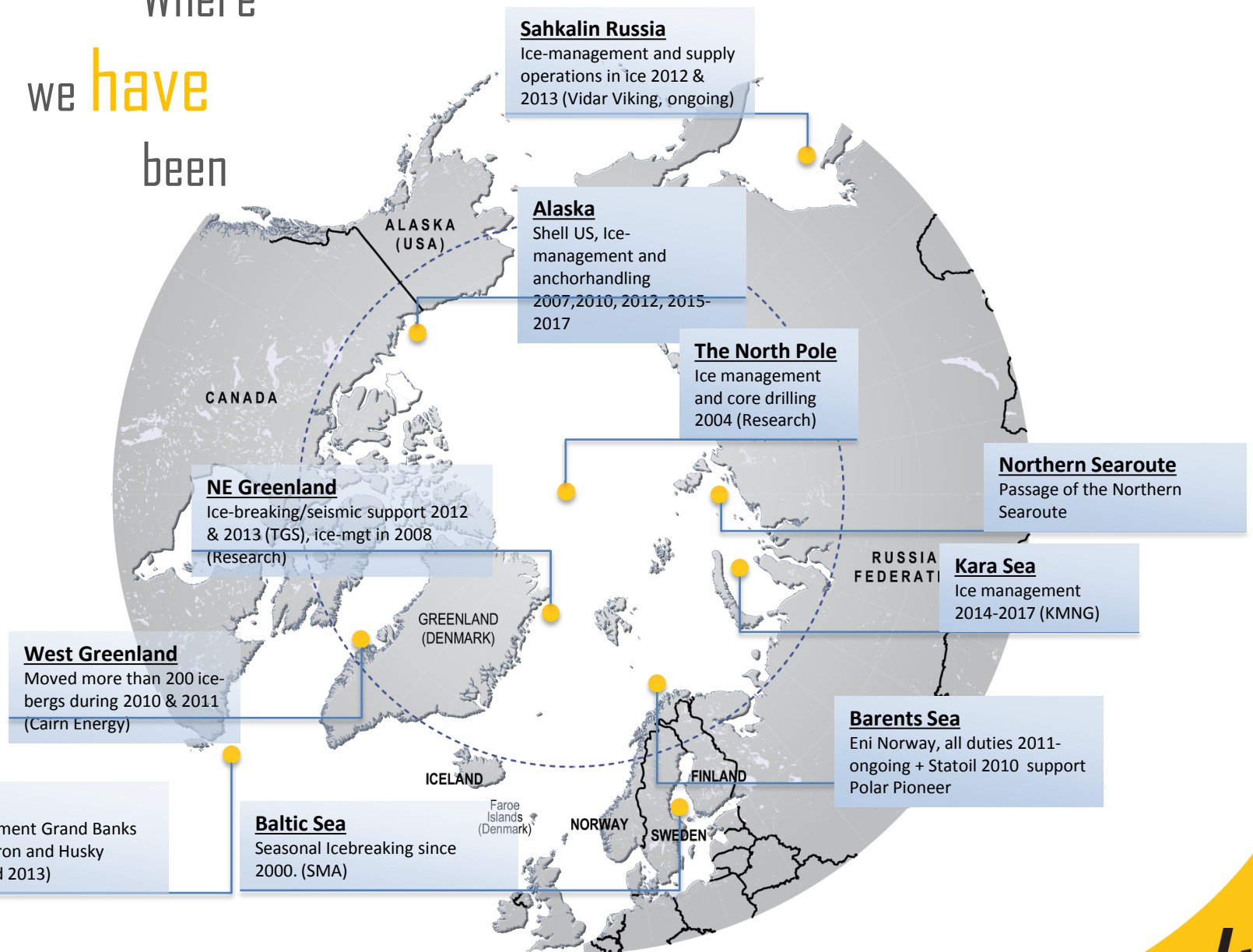
Where we are



Current fleet

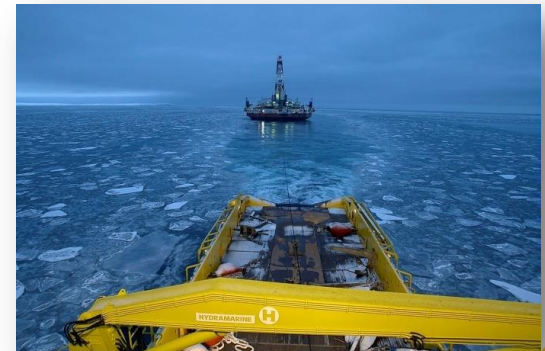
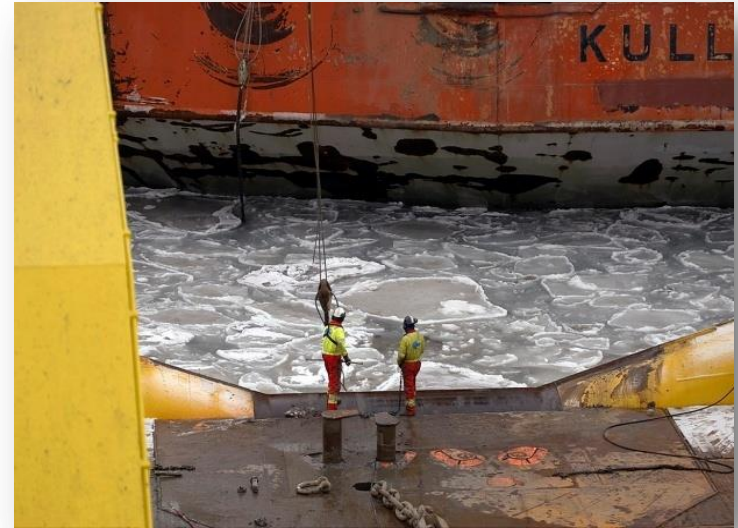
Vessels	Type	Description	BP/Deck	Ice-class
  	Ice-breaker/ AHTS	Tor Viking class	200 tonnes	Ice 10
   	Ice-classed AHTS	Loke Viking class	221 tonnes	Ice 1A
    	PSV	VS 470 Mk II	710 sq. Meter	N/A
	PSV	SBS Cirrus	840 sq. Meter	N/A
	AHTS	Odin Viking	183 tonnes	N/A
	Ice-breaker	Oden (SMA mgt)	250 tonnes	PC-2
  	Ice-breaker	Atle class (SMA mgt)	186 tonnes	1A-Super IB
	Ice-breaker	Ale class (SMA mgt)	51 tonnes	1A-Super IB

Where
we **have**
been



Beaufort Sea 2007, 2010 and 2012

- In 2007, 2010 and 2012 Tor Viking was working for Shell for operations North of Alaska in the Beaufort Sea and Chukchi Sea.
- The vessel supported the offshore rigs Kulluk and Northern Discoverer.
- SOW; Anchor handling in ice, towing, ice management and other support duties.



Beaufort Sea 2007, 2010 and 2012

- Planning is key to success;
 - Important to involve senior officers at an early stage of the process,
 - Charterers expectation of vessel and crew.

Challenges:

- Base Landskrona Swe, 45 days transit each direction. 8 Months from arrival to return Europe, not alongside any berth.
- Provision; 1 Month of supplies ideal.
- Engine / Spare Parts; unforeseen events.
- Fuel; Low Sulphur, Emissions to air. Hose connection; same line from rig to vessel as to bunker supplier.
- Oil Spill, Sludge, general waste – 2010; all garbage stored onboard from June to October, Environmental and health control, purge garbage. Use of incinerator rules, Seattle.
- Tangled propellers, what to do – 2 Week transit to nearest Dock.
- Local Knowledge; Agents, Logistics, Spare Parts availability.
- Crew Change; 5 days , Helicopter to rig, basket to vessel, Handover need to be well prepared in advance (1hr). Team spirit!
- Illness; Heart attack – Proactive focus; what if...
- Back up crew («3rd shift»); Visa, Work permit take months, needs to be prepared in advance.
- Working cloths for rough and cold weather; -23 degrees + wind, 5/10min
- Other training (Inuit local knowledge, how to behave, what to do)
- Change of plan, Management of change

Iceberg towing/Ice Management West Greenland 2010/11

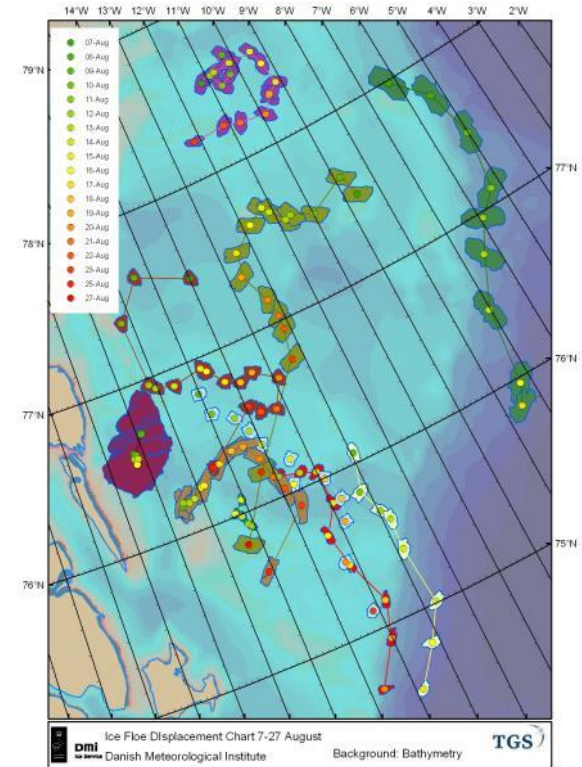
- Chartered by Capricorn Greenland Exploration (Cairn Energy) for iceberg management duties.
- SOW; detect, monitor, tow and deflect numerous of icebergs making a threat to the drilling operations on the various rigs and locations.
- Fiber ropes and iceberg towing gear specially designed for deflecting ice bergs.
- The vessels towed more than 200 icebergs.



Seismic support NE Greenland 2012/13 for TGS



- Balder Viking chartered by TGS Nopec for 60-80 days NE Greenland
- Campaign by Bureau of Minerals and Petroleum Greenland
- High success with 5000 km seismic lines carried out for the first time in this area
- The Russian Seismic vessel “Akademik Shatskiy” with ice class 1A
- 79-80 degrees North
- Challenging area in terms of ice conditions, weather (fog) and remote from any logistics
- Crew change from Spitsbergen with fishing vessel
- No refueling during the 60 days campaign
- Dual engine helicopter from Fonna Fly AS



West / NE Greenland – Logistics issues

■ Summary

West Greenland

- Lack of infrastructure, lack of quays, Draft restrictions, several vessels, Storage barge,
- PSV shuttle traffic to Aberdeen/Peterhead 6-7 days transit.
- Local Knowledge – Agents, Logistics, Spare Parts availability
- Engine / Spare Parts unforeseen events
- Crew Change, at quay side, chartered plane
- Illness, AB broken leg, Greenland personnel, Helicopter
- Other training Ice Net, Ice Berg towage etc, Restricted involvement with local people
- Greenpeace, NGO issues
- Provision, 1 Months supplies ideally,
- Oil Spill, Sludge, general waste –need to be planned ahead
- Change of plan, Management of change
- Tangled propellers, what to do – divers available, due to high risk with fibre ropes

North East Greenland

- Lack of infrastructure, lack of quay, lack of anything
- Stand alone operation, Logistics via Svalbard, 3.5 days transit with Kvitebjørn,
- Local Knowledge – Agents, Logistics, Spare Parts availability
- Engine / Spare Parts unforeseen events
- Crew Change, at sea with assist vessel
- Illness, Dense Fog, remote to airport, Helicopter not available
- Other training, general ice management, corporation between seismic and ice breaker, how they operate
- Greenpeace, NGO issues
- Provision, 2 Months supplies ideally
- Oil Spill, Sludge, general waste –need to be planned ahead
- Change of plan, Management of change
- Tangled propellers, what to do – towage to Spitsbergen with divers flown in from Norway
- Icing in ice vs open water; end of project due to lack of experience and knowledge onboard Seismic vsl.

Kara Sea

- Client KMNG (JV Exxon/Rosneft)
- Balder Viking, Loke Viking, Magne Viking & Brage Viking.
- Mobilisation started 29th of May 2014
- Demob expected October/November 2014
- Due to previous experience and track record; large contract, with extended SOW:
 - Rig towage
 - Prelay and Hook-up of Anchor System.
 - VSS / Company Ice Centre (During operation)
 - Ice management Kara Sea
 - Ice Academy; VSS Training facilities for all Marine crew involved in project (incl. other owners.)
 - Ice Advisors (SMA)
 - Satellite
 - Met Ocean Weather Analysis
 - Supply and mobilisation of Ice Towing Equipment.



VSS/Company Ice Centre

ONSHORE



SAT Imagery

Met Ocean info.

StormGeo



Ice Map/Ice Forecast

Airplane Surveillance



Strategy

OFFSHORE



VSAT-IRIDIUM

Tactical Ice Tracking and Communication System Real time/Near real time update
Eg. Kongsberg, MT, ION

- Vessel/rig Position, speed and heading
- Replication of SAT Imagery
- Replication of Ice charts
- Replication of Met ocean Info
- Replication of Radar images
- Iceberg, floe, ridges position, heading and speed
- Onshore/Offshore Messaging system
- Onshore/Offshore Telecon System
- Logistics Tracking and Planning

Drones



Logistics Tracking

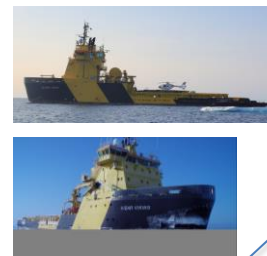


Oilspill Monitoring

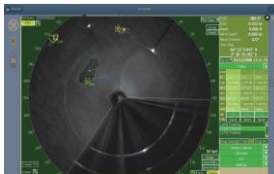


Tactical Instructions
Operation progress

Ice Radar image
Met Ocean Info
Ice/Floe/Iceberg Info



Ice drift beacons



Ice Towing equipment

