



Maritime Safety in a future with Autonomous Vessels

Sjøsikkerhet i en fremtid med autonome skipsoperasjoner

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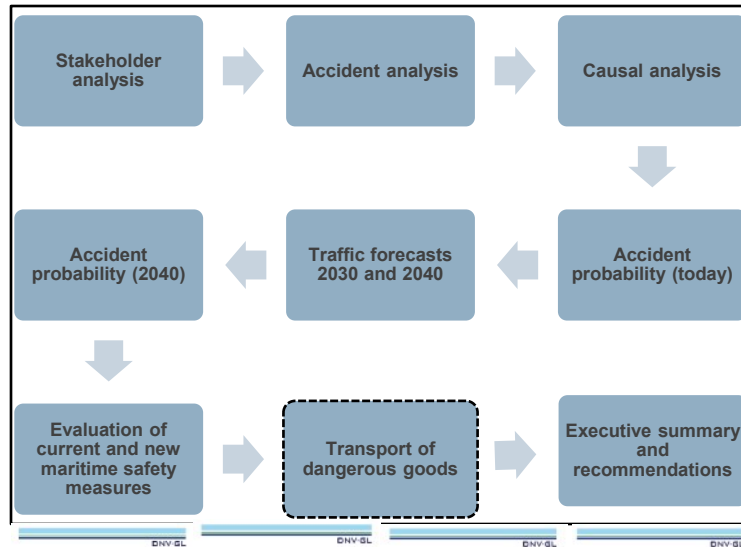
2017 – Trends influencing the Maritime domain

- Effective/Green operations
- Digitalization
- Revolution in Transportation

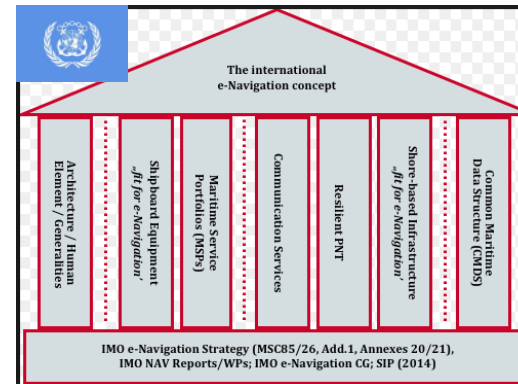


Core Knowledge and Guidance – Maritime Safety

Maritime Safety Analysis 2014/15



IMO E-nav SIP



National Transport Plan



White Paper 2016



NCA 2050 Perspective Analysis



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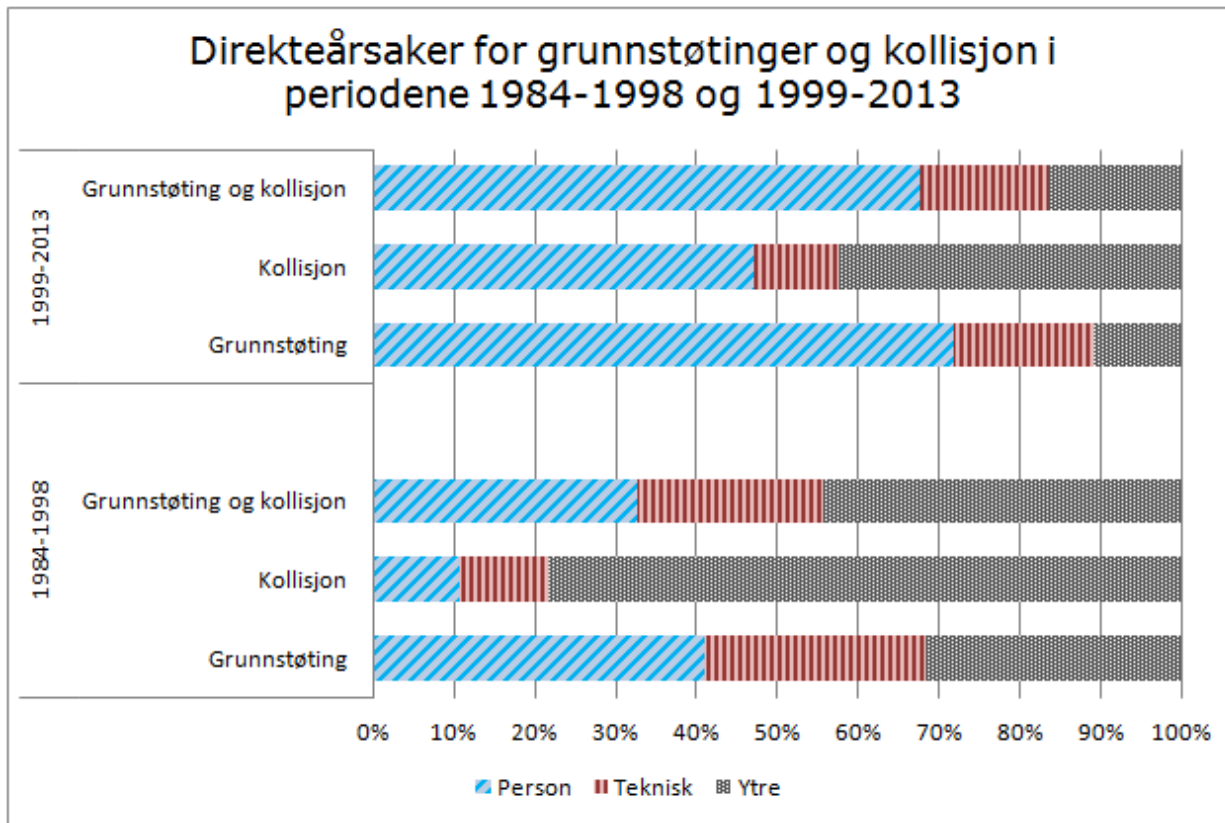
Some Key factors



Autonomy



Accident Statistics – Direct Causes



- Human error as a cause
 - Approx 33 % prior to 1999
 - Approx 68 % after 1999
- Technical failure as a cause
 - Approx 23 % prior to 1999
 - Approx 16 % after 1999
- External factors as a cause
 - Approx 44 % prior to 1999
 - Approx 16 % after 1999



The NCA and Autonomous Ships



Focus comes naturally

- NCA core values – Provident (forward-looking)
- NCA Perspective Analysis – "advanced technology skills will be essential"
- Letter of assignment – Focus on Digitalization, Efficiency, ITS and "the green shift"



- NFAS co-founder and board member
- Test area Trondheimsfjorden
- R&D involvements
 - OceanSpaceLab
 - ASTAT
 - SAREPTA
 - "Grønt kystfartsprogram"
 - (AUTOTranS)
 - E-nav demonstrators
 - Dynamic risk monitoring
- Chairman NFAS working group on "Technology gaps, standards and needed developments"



Autonomous ships – some NCA issues

Technology – Operation - Legislation



Maritime Pilotage



VTS vs Autonomous Ship



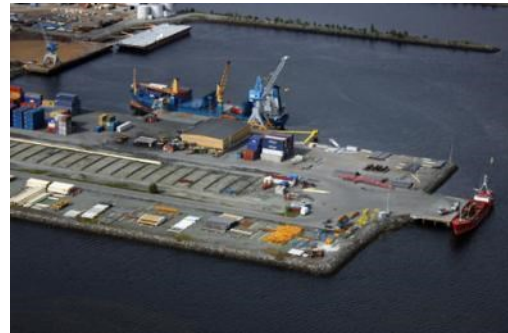
Emergency Towing



Aids to Navigation –
future developments ?



Monitoring, Message
systems and information
services – future needs ?



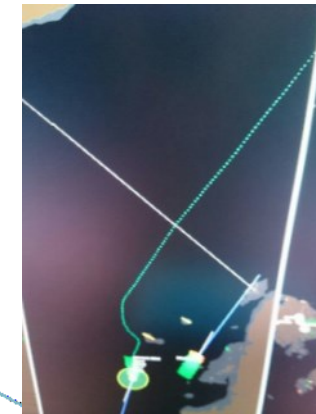
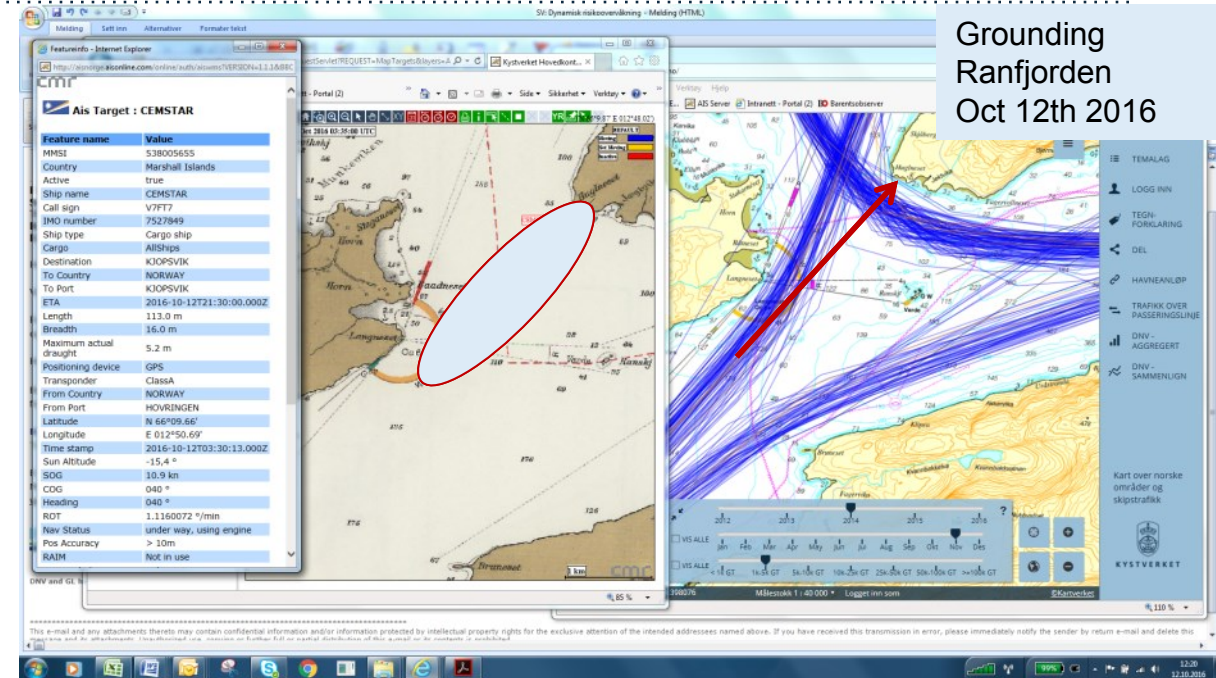
Efficient Ports and Freight
Transportation



Legislation



Dynamic Risk Monitoring



Some interesting projects

Grønt Kystfartsprogram – electric autonomous feeder

Forslag til nytt pilotprosjekt

Autonom – elektrisk feeder
Stavanger - Bergen




Energi

TBN



Maritim operasjon

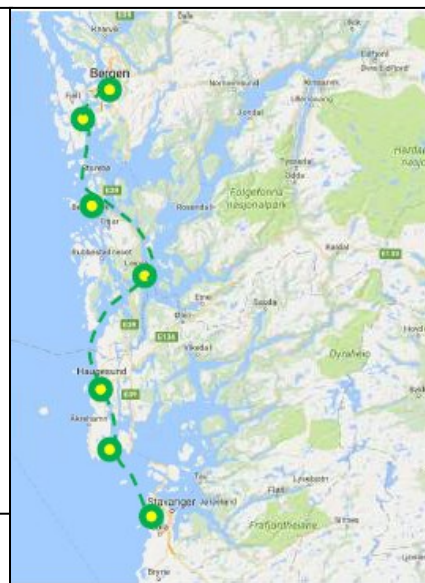



Logistikk

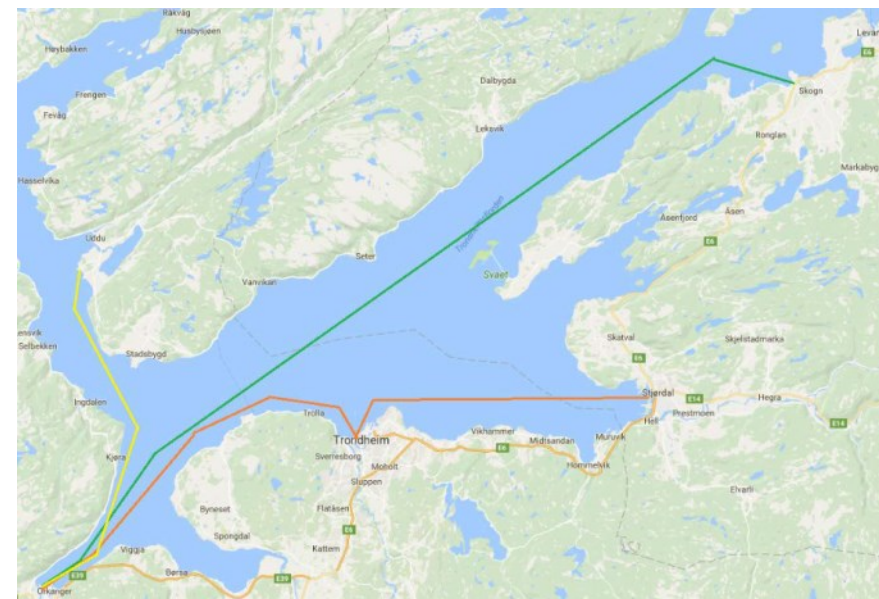


Teknologi/regelverk

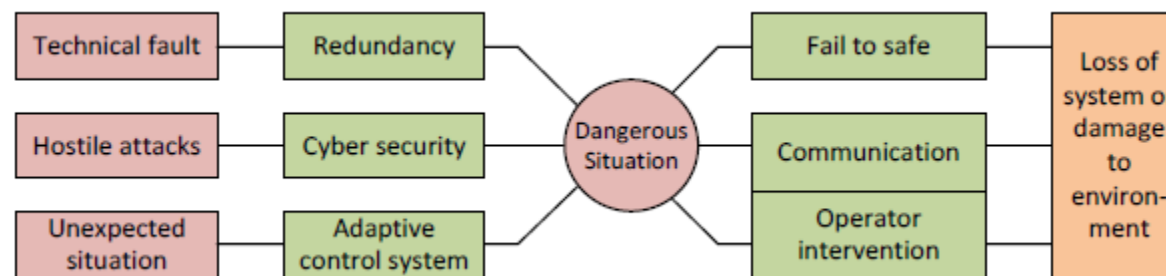




ASTAT



HRÖNN

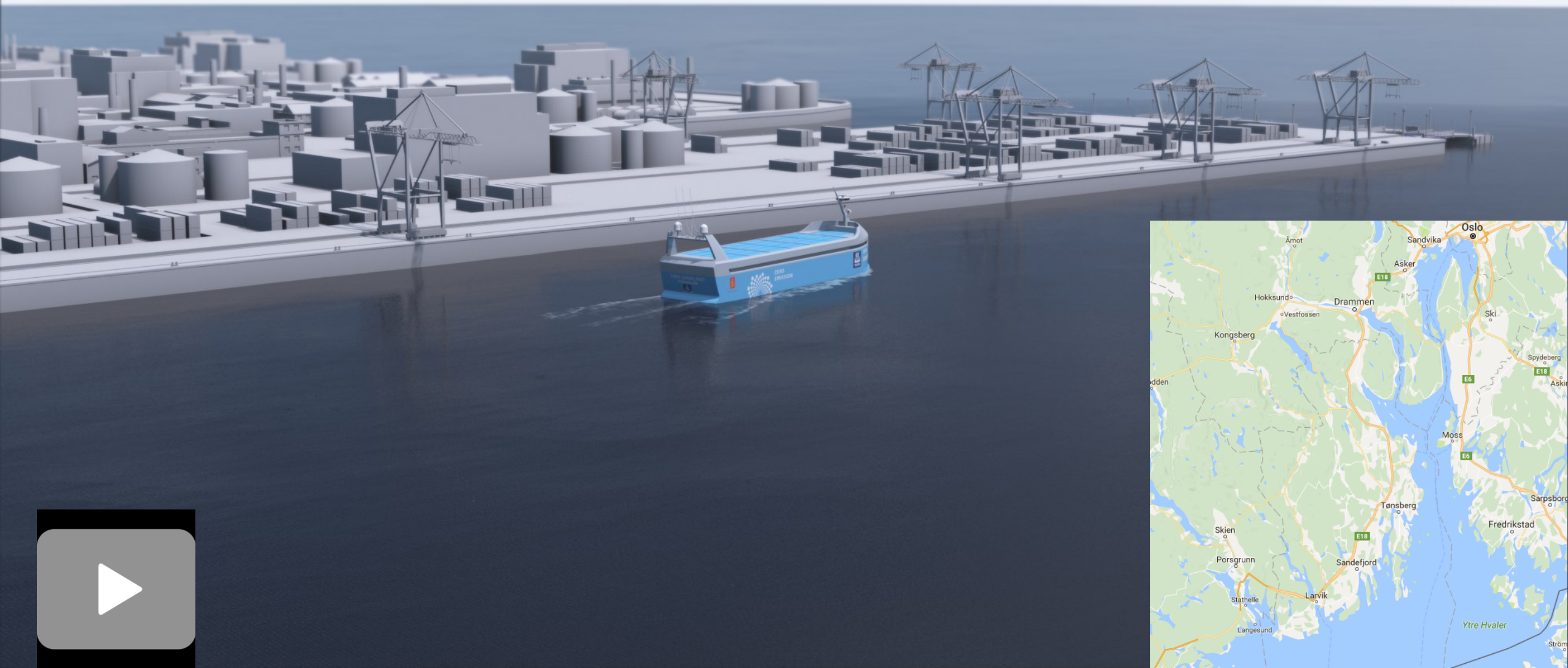


SAREPTA



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YARA BIRKELAND



NCA Tools and Advantages

Historical AIS data – "A treasure chest"



State Of The Art services



Innovation minded



Qualified
and
Dedicated
personnel



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Prerequisite for Success – the way forward

**SAFETY
IS OUR #1
PRIORITY**

Essential to demonstrate that new operations are safe, and that maritime safety is not compromised



- R&D activities
- Close Cooperation
- Efficiency
- Communication and information
- International cooperation and information exchange

NFAS Norwegian Forum for Autonomous Ships



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Thank you for your attention

