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NORWEGIAN COASTAL ADMINISTRATION

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# Ensuring safe and efficient maritime transport

National approach to autonomous ships – Norwegian Coastal Administration

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Trondheim, May 7th 2018



# The Norwegian Coastal Administration

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- National agency for safe navigation, coastal management and preparedness against acute pollution.
- An advisory and executive agency of the Ministry of Transport and Communications.
- Facilitates shipping as an *efficient*, *reliable* and *green* transport option.



Constituted Coastal Director  
Per Jan Osdal



# 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 Digitization, Efficiency, ITS and "the green shift"



# Approach and preliminary requirements

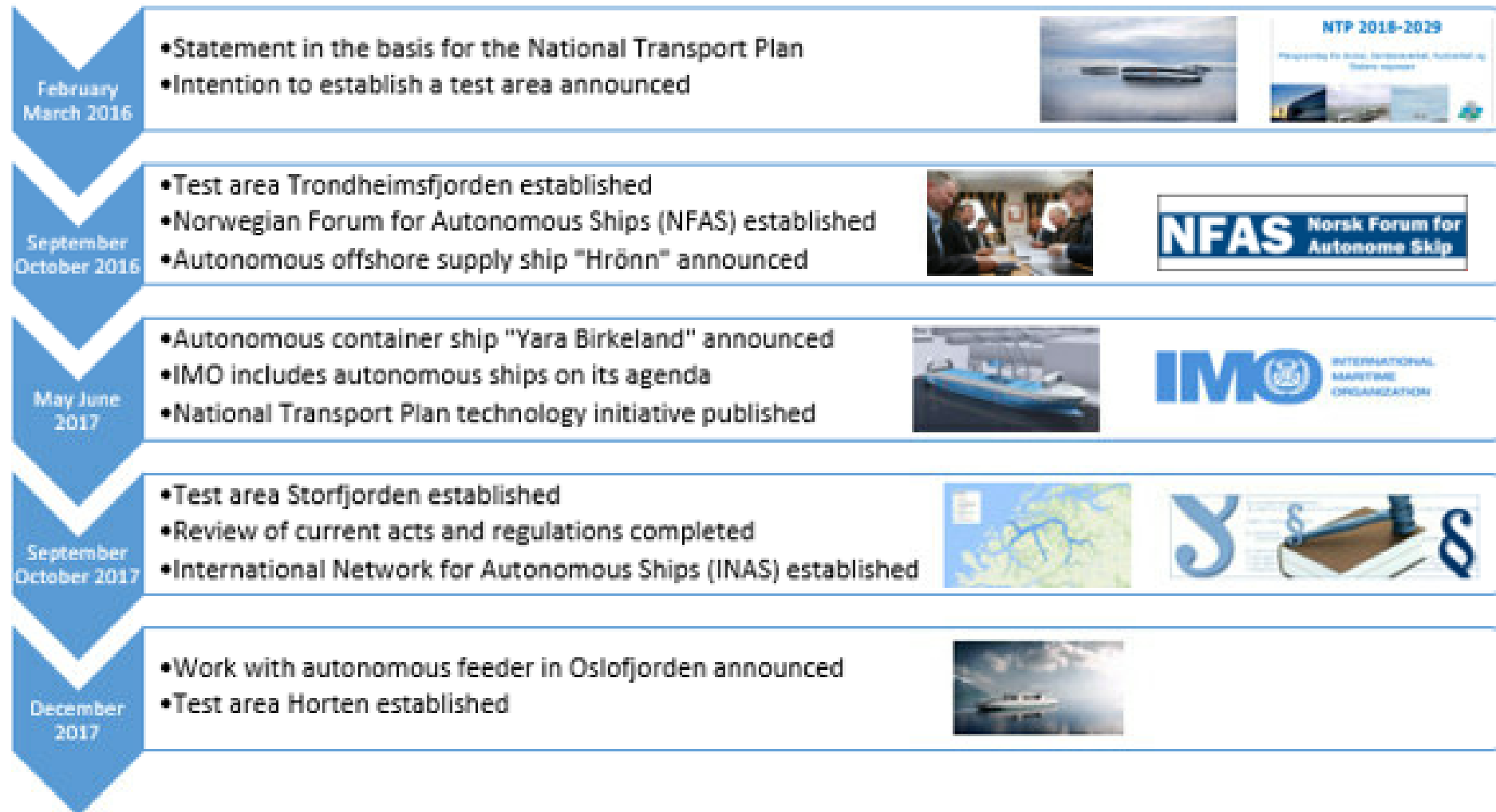
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- The NCA has chosen an industry-friendly and innovation-promoting approach
- One main requirement:  
It must be documented that the maritime safety level is kept at the same level or better than with a manned vessel
- In addition, some functional requirements must be met:
  - An autonomous vessel must be able to communicate with and follow the instructions from a VTS
  - An autonomous vessel must be able to be towed
  - An autonomous vessel must be able to comply with any pilotage requirements



*Image 1 The autonomy evolution in Norway*

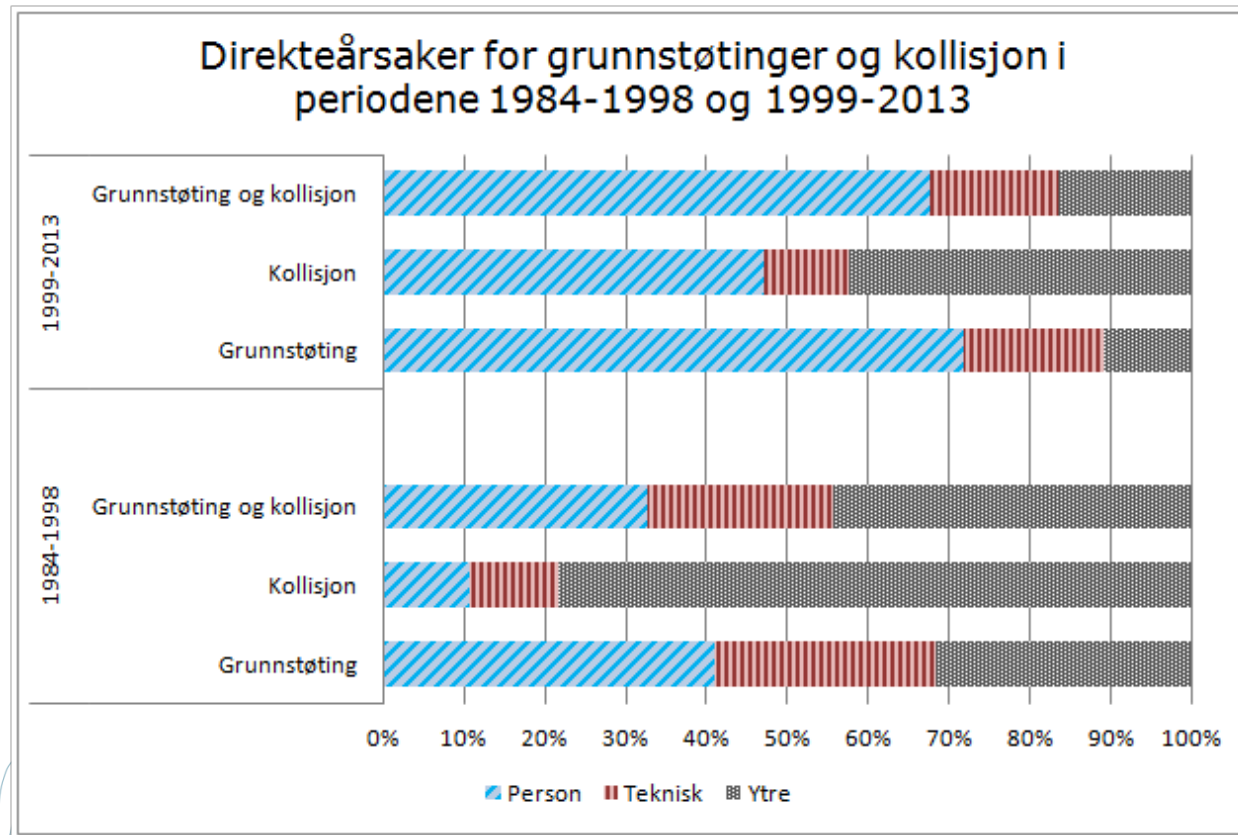


# Why autonomy/automation?

- Autonomy/automation is not a goal, but it can help achieve other goals
  - Environmental goals
  - Transportation goals
  - Economic goals (value creation)
  - Efficiency goals



# 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





# Autonomous ships – some NCA issues

Technology – Operation - Legislation

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Maritime Pilotage



VTS vs Autonomous Ship



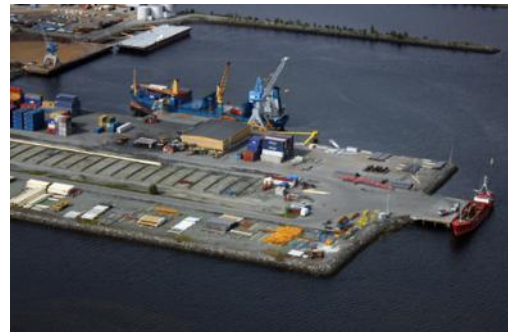
Emergency Towing



Aids to Navigation –  
future developments ?



Monitoring, Message  
systems and information  
services – future needs ?



Efficient Ports and Freight  
Transportation



Legislation





# Challenges

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There are many challenges associated with facilitating autonomous transport solutions at sea, but the current three main challenges for the NCA are probably the following:

- Current acts and regulations, but also all of our current maritime safety services, assume that there are people on board the ship.
- It seems like almost all new projects will be very different and that you have to find different ways to solve safety, depending on the route, type of ships, existing infrastructure etc.
- State management, budgeting, and decision-making processes are not adapted to cope with rapid development



# Status acts and regulations – autonomous ships

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- The Harbour and Fairways Act – the proposal for a new Act is currently undergoing national consultation.
- The Pilotage Act – work is underway to revise the law. A proposal for a new Act was recently published for national consultation
- Maritime Traffic Regulations and Compulsory Pilotage Regulations still need to be revised (work will start this coming fall).



# Prerequisite for Success – the way forward



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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# CLEAN, SAFE AND EFFICIENT SEAWAYS

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