The Netherlands

Inland Waterways

Autonomous Shipping

Inge Willemsen
Bart van Gent
Anja van der Sluijs

11 November 2017
Contents

1. Testing and experimenting with smart ships in the Netherlands

2. Development smart ships: some examples & main Dutch research project (sea-going vessels)

Anja van der Sluijs:
3. Current situation (missing) technology inland vessels
Dutch government approach to smart shipping

Smart shipping
• automated and/or digital systems that
• support, complete or replace human actions on board of a ship
• different levels of autonomy
• autonomous = highest level; autonomous ≠ unmanned

Active attitude!
• Facilitation
• Stimulation
• Contribution
• Cooperation
https://smartshippingchallenge.nl/: November 30th!
Tests and experiments: maximum possibilities

- Every inland waterway
- Application to single point of contact
- Projectplan: safety and risks
- Permission of government based on exceptions within Dutch legislation: events and special transport
- If necessary: extra conditions from fairway manager
- In return: evaluation & test results

Legend
- main waterways
- 2,137 km of canals and rivers
- 5,472 km of waterways in open water
- 84 locks
- 278 bridges
Maximum possibilities: different locations
Moezelhaven Amsterdam: test location for drones

**DRONES TE WATER**

**WOENSDAG 5 APRIL 2017**
Start 15h00
Einde 17h30

**PRODOCK**
Rijnhaven Rotterdam: test location smart ships
Test in the Rijnhaven, Rotterdam...
Work in progress

• Tests in the North Sea

• Smart ports

• Smart infrastructure

• Data connectivity, data sharing, cybersecurity (comfort)

• Commercial smart shipping in near future:
  - Amsterdam – Antwerpen
  - Guard ships North Sea
  - Water sampling North Sea
Some smart (ships) projects
In the canals: MIT and Amsterdam work on Roboats
If it works in Amsterdam...
CoVadem: up-to-date water depths information for and by skippers, hosted by the government

Continuously up-to-date water depths information by combining a 'sailing network' with state of the art Big Data technology. We harvest depth information readings from the collaborating vessels and combine these on our Cloud hosted servers. There, the data are being filtered, processed, enriched, managed and finally distributed to a growing range of services for the benefit of our members. Always available. Always the latest information. The river network as it was seen by your vessels.
Joint Industry Project Autonomous Shipping

Bosch Rexroth B.V.
Wärtsilä Netherlands BV

TNO

Ministerie van Defensie

CIG Maritime Technology B.V.

Conoship International BV

MARIN

Maritiem Instituut Willem Barentz

RDM Centre of Expertise

Netherlands Maritime Technology Foundation

Oceansat B.V.

Alphatron

STC-Group

Thales Nederland B.V.

Loodswezen

Saab Technologies B.V.

Seazip

STC-Group

Damen Shipyards Group

TU Delft

De Voogt Naval Architects B.V.

Ministerie van Infrastructuur en Milieu
Joint Industry Project Autonomous Shipping

“The Joint Industry Project sees companies, governmental organisations, educational institutes and research institutes working together to identify, integrate and demonstrate the available technology required for the use of vessels which are sailing without interference of crew on board, by combining remote monitoring and controlling with various levels of autonomy. These technologies include the strategies for monitoring and control of ship systems, the ship-shore communication, the shore control functions, the traffic management and the design approach of unmanned ships. This will create insight into and help develop the missing technologies for market uptake of autonomous shipping with vessels that will be designed and equipped for this purpose.
Focus of the JIP Autonomous Shipping

Starting point: to demonstrate remote monitoring and system control, which is believed to be proven technology.

The focus of the project will be on demonstration of:
1. capability to situational awareness of the ships environment,
2. the various levels of autonomy in on board systems and
3. the safety of traffic flows.

While a great deal of technology is already available, the integration and demonstration thereof is required in order to realize autonomous shipping. This would provide insights into the missing technologies as well as cost-saving opportunities. The demonstration might involve simulations, partial tests at production sites and ultimately a series of tests on board of a seagoing vessel.
JIP Autonomous Shipping: work packages

1. Literature study and business case
2. Definition of nautical scenario’s and methods to process traffic management
3. Analysis of safety and reliability of ship and systems
4. Collection, processing and communication of data
5. Design for unmanned operations
6. Preparation of demonstrations
7. Execution and analysis of demonstrations
8. Roadmap

In 2020: demonstration autonomous ship (sea-going)