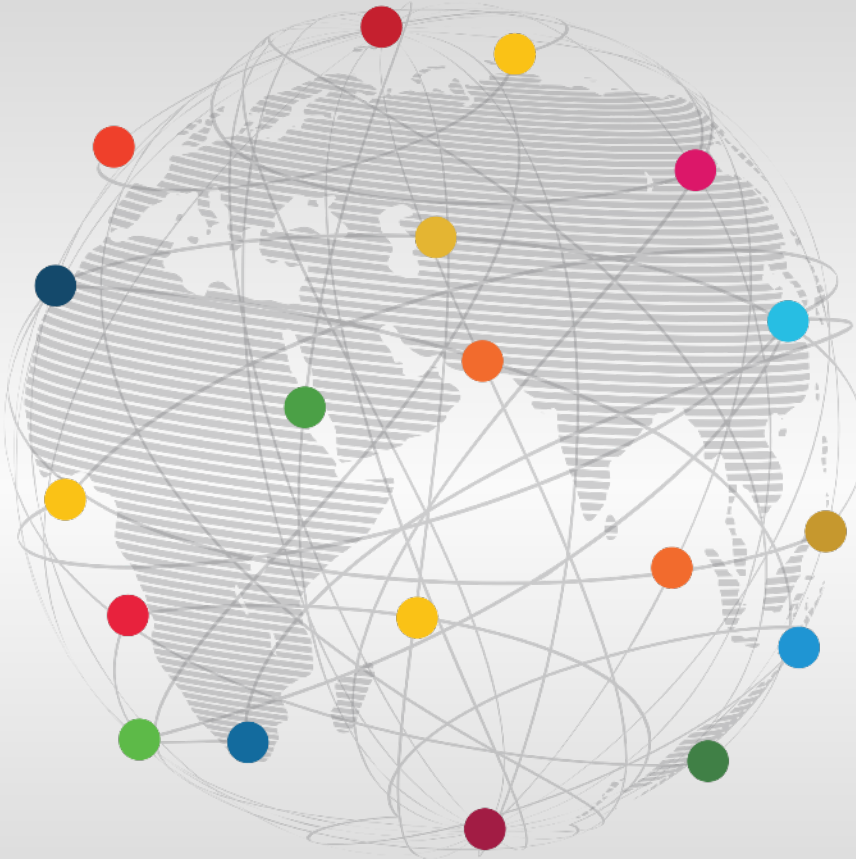
Autonomous shipping and Inland Navigation

Workshop on 14 February 2018

Mr. Sim Turf, Chair of SC.3



INLAND TRANSPORT COMMITTEE

UNECE

Workshop “Autonomous shipping and Inland Navigation”

Background and purpose

INLAND TRANSPORT COMMITTEE

RECENT PROGRESS

- existing Maritime Autonomous Surface Ships (MASS)
- Programmes and test areas for smart shipping (Flanders
- Codes of Conduct and practice, Codes for testing
- Cybersecurity
- Work by classification societies

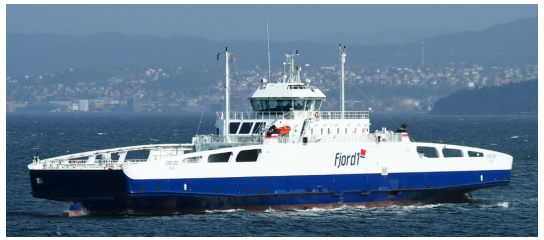
KEY PLAYERS

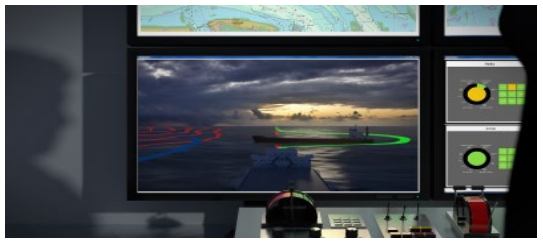
MASS :

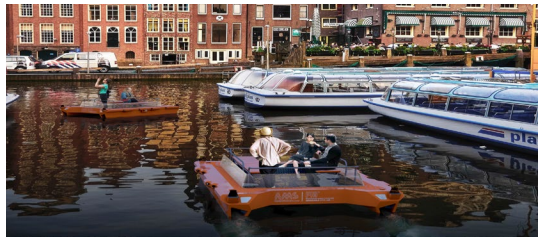
IMO Maritime Safety Committee, UK Marine Autonomous Systems Regulatory Working Group (MASRWG), IALA, PIANC, NFAS, SINTEF, DIMECC, One Sea - autonomous maritime ecosystem (Finland) …

Inland waterways :

CCNR , De Vlaamse Waterweg nv (Belgium), the Netherlands, …





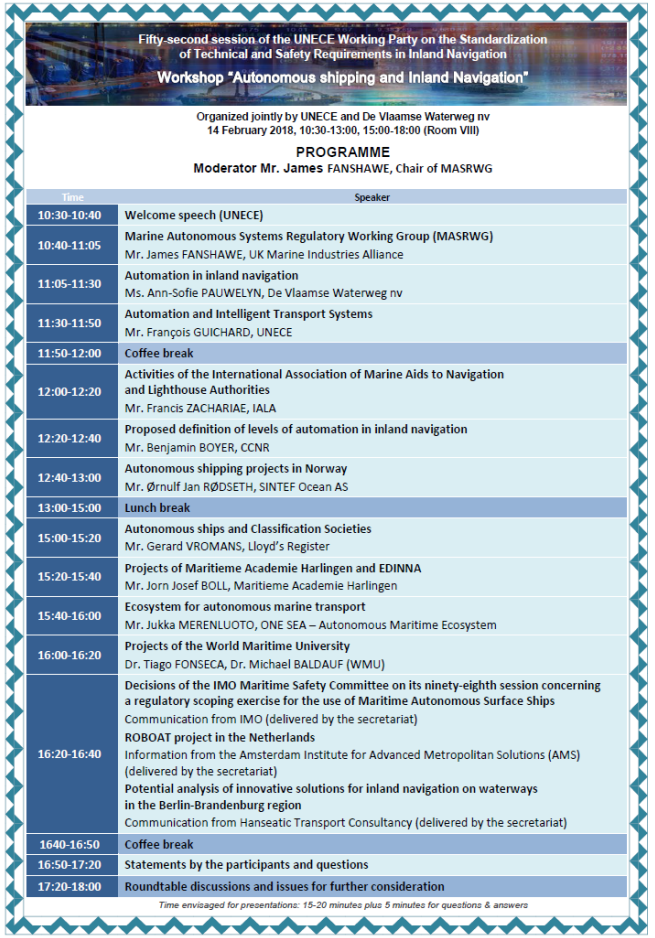


Workshop “Autonomous shipping and Inland Navigation”

Speakers and the programme

INLAND TRANSPORT COMMITTEE

- Organized jointly by ECE and De Vlaamse Waterweg nv
- Key speakers: MASRWG, De Vlaamse Waterweg nv (Belgium), IALA, CCNR, Lloyd’s Register, Norwegian Forum for Autonomous Ships/SINTEF Ocean, One Sea — autonomous maritime ecosystem Maritieme Academie Harlingen, World Maritime University
- Inputs: IMO, Hanseatic Transport Consultancy, the Amsterdam Institute for Advanced Metropolitan Solutions
- Round table discussions: digitalization, priorities, advantages and challenges of autonomous shipping on inland waterways and interaction with the maritime sector
- Presentations are available at https://www.unece.org/trans/main/sc3/wp3/wp3doc_2018.html



Fifty-second session of the UNECE Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation

Workshop “Autonomous shipping and Inland Navigation”

Organized jointly by UNECE and De Vlaamse Waterweg nv
14 February 2018, 10:30-13:00, 15:00-18:00 (Room VIII)

PROGRAMME

Moderator Mr. James FANSHAWE, Chair of MASRWG

Time	Speaker
10:30-10:40	Welcome speech (UNECE)
10:40-11:05	Marine Autonomous Systems Regulatory Working Group (MASRWG) Mr. James FANSHAWE, UK Marine Industries Alliance
11:05-11:30	Automation in inland navigation Ms. Ann-Sofie PAUWELYN, De Vlaamse Waterweg nv
11:30-11:50	Automation and Intelligent Transport Systems Mr. François GUICHARD, UNECE
11:50-12:00	Coffee break
12:00-12:20	Activities of the International Association of Marine Aids to Navigation and Lighthouse Authorities Mr. Francis ZACHARIAE, IALA
12:20-12:40	Proposed definition of levels of automation in inland navigation Mr. Benjamin BOYER, CCNR
12:40-13:00	Autonomous shipping projects in Norway Mr. Ørnulf Jan RØDSETH, SINTEF Ocean AS
13:00-15:00	Lunch break
15:00-15:20	Autonomous ships and Classification Societies Mr. Gerard VROMANS, Lloyd’s Register
15:20-15:40	Projects of Maritieme Academie Harlingen and EDINNA Mr. Jorn Josef BOLL, Maritieme Academie Harlingen
15:40-16:00	Ecosystem for autonomous marine transport Mr. Jukka MERENLUOTO, ONE SEA – Autonomous Maritime Ecosystem
16:00-16:20	Projects of the World Maritime University Dr. Tiago FONSECA, Dr. Michael BALDAUF (WMU)
16:20-16:40	Decisions of the IMO Maritime Safety Committee on its ninety-eighth session concerning a regulatory scoping exercise for the use of Maritime Autonomous Surface Ships Communication from IMO (delivered by the secretariat) ROBOAT project in the Netherlands Information from the Amsterdam Institute for Advanced Metropolitan Solutions (AMS) (delivered by the secretariat) Potential analysis of innovative solutions for inland navigation on waterways in the Berlin-Brandenburg region Communication from Hanseatic Transport Consultancy (delivered by the secretariat)
1640-16:50	Coffee break
16:50-17:20	Statements by the participants and questions
17:20-18:00	Roundtable discussions and issues for further consideration

Time envisaged for presentations: 15-20 minutes plus 5 minutes for questions & answers

Definitions of automation levels

CCNR Resolution 2018-II-16

INLAND TRANSPORT COMMITTEE

Level 0
(No automation) as the basic level

Automation levels: 1 to 5

Follow-up: more in-depth discussions to enable the definition to be amended by 2020, if so required

Consideration and acceptance by SC.3

	Level	Designation	Vessel command (steering, propulsion, wheelhouse, …)	Monitoring of and responding to navigational environment	Fallback performance of dynamic navigation tasks	Remote control
BOATMASTER PERFORMS PART OR ALL OF THE DYNAMIC NAVIGATION TASKS	0	**NO AUTOMATION** the full-time performance by the human boatmaster of all aspects of the dynamic navigation tasks, even when supported by warning or intervention systems *E.g. navigation with support of radar installation*				No
	1	**STEERING ASSISTANCE** the context-specific performance by a steering automation system using certain information about the navigational environment and with the expectation that the human boatmaster performs all remaining aspects of the dynamic navigation tasks *E.g. rate-of-turn regulator* *E.g. trackpilot (track-keeping system for inland vessels along pre-defined guiding lines)*				
	2	**PARTIAL AUTOMATION** the context-specific performance by a navigation automation system of both steering and propulsion using certain information about the navigational environment and with the expectation that the human boatmaster performs all remaining aspects of the dynamic navigation tasks				Subject to context specific execution, remote control is possible (vessel command, monitoring of and responding to navigational environment and fallback performance). It may have an influence on crew requirements (number or qualification).
SYSTEM PERFORMS THE ENTIRE DYNAMIC NAVIGATION TASKS (WHEN ENGAGED)	3	**CONDITIONAL AUTOMATION** the sustained context-specific performance by a navigation automation system of all dynamic navigation tasks, including collision avoidance, with the expectation that the human boatmaster will be receptive to requests to intervene and to system failures and will respond appropriately				
	4	**HIGH AUTOMATION** the sustained context-specific performance by a navigation automation system of all dynamic navigation tasks and fallback performance, without expecting a human boatmaster responding to a request to intervene[1] *E.g. vessel operating on a canal section between two successive locks (environment well known), but the automation system is not able to manage alone the passage through the lock (requiring human intervention)*				
	5	**AUTONOMOUS = FULL AUTOMATION** the sustained and unconditional performance by a navigation automation system of all dynamic navigation tasks and fallback performance, without expecting a human boatmaster responding to a request to intervene				

[1] This level introduces two different functionalities: the ability of "normal" operation without expecting human intervention and the exhaustive fallback performance. Two sub-levels could be envisaged.

Workshop “Autonomous shipping and Inland Navigation”

Outcome and next steps

INLAND TRANSPORT COMMITTEE

Added values

- Fostering innovations
- Competitiveness of IWT
- Ensuring navigation safety
- Enhancing mobility

Priorities and next steps

- Dissemination of information
- R&D, pilot projects and tests
- Development of the legislative basis
- Insurance policy

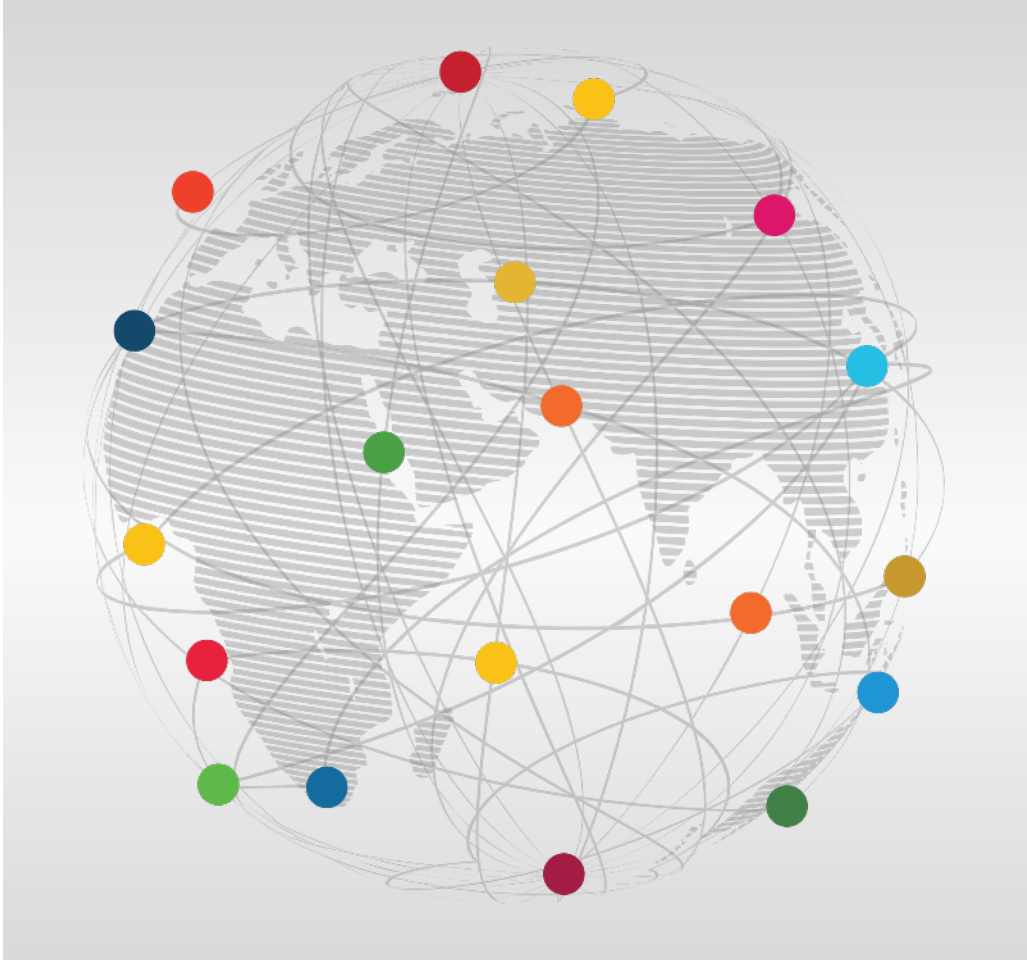
Particular features of inland navigation should be taken into account

International cooperation is of major importance

Follow-up at the sixty-second session of SC.3

Thank you!

Sim Turf
Chair of SC.3
UNECE
21 February 2019, Geneva



INLAND TRANSPORT COMMITTEE

UNECE