Autonomous shipping and Inland Navigation

Workshop on 14 February 2018

Mr. Sim Turf, Chair of SC.3
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

Definitions of automation levels
CCNR Resolution 2018-II-16

<table>
<thead>
<tr>
<th>Level</th>
<th>Designation</th>
<th>Vessel control (steering, propulsion, wheelhouse,...)</th>
<th>Monitoring of and responding to navigational environments</th>
<th>Fallback performance of dynamic navigation tasks</th>
<th>Remote control</th>
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<tbody>
<tr>
<td>0</td>
<td>NO AUTOMATION</td>
<td>the full time performance by the human boatmaster of all aspects of the dynamic navigation tasks; even when supported by warning or intervention systems</td>
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<td>E.g. navigation with support of radar installation</td>
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<td>1</td>
<td>STEERING ASSISTANCE</td>
<td>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</td>
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<td>E.g. rudder control, rudder control with input from automated steering systems</td>
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<td>2</td>
<td>PARTIAL AUTOMATION</td>
<td>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</td>
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<td>E.g. track preservation system for inland vessels along pre-defined path lines</td>
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<td>3</td>
<td>CONDITIONAL AUTOMATION</td>
<td>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</td>
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<td>4</td>
<td>HIGH AUTOMATION</td>
<td>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</td>
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<td>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)</td>
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<td>5</td>
<td>AUTONOMOUS = FULL AUTOMATION</td>
<td>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</td>
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</table>

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.

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
Workshop “Autonomous shipping and Inland Navigation”
Outcome and next steps

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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