Possible impact of MASS on IMO's facilitation activities

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The fourth shipping revolution is on

1. Mechanized Power
2. Mass Production
3. Computerized Control
4. Maritime 4.0
The essence is digitalization and automation and MASS is part of it.
MASS: Maritime autonomous ship system

The Autonomous Ship System:
- The ship
- The automation
- The humans
- The support systems
- The connectivity
MASS requires automated communication
Some covered by (several) industry standards

<table>
<thead>
<tr>
<th>Category</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onboard networks</td>
<td>IEC 61162, ISO 16425, ISO 19847/48</td>
</tr>
<tr>
<td>Automatic data transfer</td>
<td>IEC 63173-2, ISO 28005-1, ISO 19848</td>
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<tr>
<td>Automated port</td>
<td>ISO 28005, IALA S-211</td>
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<tr>
<td>Cyber security</td>
<td>ISO 23806, IEC 63154</td>
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<tr>
<td>MSW, reporting</td>
<td>ISO 28005, UN/EDIFACT, IALA G1159</td>
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<tr>
<td>Just in Time arrival</td>
<td>IALA S-211, DCSA, ISO 28005-3</td>
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Just a few examples, many more!
A new focal point: The IMO Compendium/Reference Data Model

Key sources of data
- The FAL Forms
- Maritime Declaration of Health
- Stowaways
- Waste reporting
- Just in Time arrival
- Ship Certificate list
- Mandatory Ship Reporting System
- Ballast water reporting
- ...

Initial contributors
Harmonizes data elements between domains

Agreed on common definitions

Growing number of contributors

International Standards
Digital trust and cyber security

- Digitalization in the transport systems
- Autonomous and automatic transport
- Connected and automated transport
- Automatic machine to machine communication
- To or from ships, world wide
- Secure and trusted data transmissions
Strong international competition, but also a strong need to cooperate!
Autonomous Ship System: Many interfaces

Communication ship to remote control

Interfaces to shore automation systems
Development of MASS is expensive today!

- No standard system integration
- No standard interface to RCC
- No standard port infrastructure
- No standard rules or legislation
- No standard for training of crew
- No standard risk model
Standards reduce costs and increase innovation

- Digital transformation
  - Earn money
- Digitalization
  - Save money
- Digitization
  - Spend money

- 6 billion smartphones
- 96,000 ships
  - Mostly different!
Conclusions

• Automation and digitalization will affect all ships
• This is a system, including the ship itself, port, RCC and many other parties
• Shipping is a small sector and require more cooperation in standards development
• The FAL Compendium and reference data model provide a new focal point
Thank you for your attention!

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