Future trends of MASS

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WHAT?

- MSC 99 Workgroup

“Maritime Autonomous Surface Ships:
A ship which, to a varying degree, can operate independent of human interaction”
Varying degree

1. **Ship with automated processes and decision support**: Seafarers are on board to operate and control shipboard systems and functions. Some operations may be automated.

2. **Remotely controlled ship with seafarers on board**: the ship is controlled and operated from another location, but seafarers are on board.

3. **Remotely controlled ship without seafarers on board**: the ship is controlled and operated from another location. There are no seafarers on board.

4. **Fully autonomous ship**: The operating system of the ship is able to make decisions and determine actions by itself.
Operate independent

“Shipboard systems and functions”

- Not limited to navigation and engine control
- Include other operations
  - Cargo handling and control
  - Emergency situations
  - Others
Human interaction

“Seafarers”
- Able and certified to operate the shipsystems
  - Not limited to navigation and engine control
- No Seafarers doesn’t mean no personnel
WHY MASS?

- Human element
  - Reduce “human error”
    - “According to the U.S. Coast Guard, 96% of all marine casualty occur due to human errors. The aforementioned factor is very serious and hence has given the rise to the thought of autonomous ships.”
  - Shortage of mariners
  - Piracy

- Reduce costs
  - Manning cost
  - Fuel cost
Current situation

- No regulatory framework
  - Difficult to develop MASS, specially for international voyages
  - IMO end of 2018 guidelines for MASS trials
  - IMO regulations specific for MASS 2025

- Cost
  - More expensive to build and operate an autonomous ship
    - currently satellite data is around $US4.00 per megabyte
Military
Research
Near Future
Near Future

- Short sea shipping
  - Containers
  - Bulk
  - Ro-ro

- Ferries
  - Short distance
  - Over sea
  - Personnel still on board
Autonomous service
Autonomous services

- Port services
  - Tugs
  - Pilots
  - Bunker
  - ...

New activities, new technologies
After 2030

- International regulatory framework
- Better technology
- Cheaper technology
- Trained personnel
- Adapted port facilities
Larger people carriers
Larger cargo vessels
Longer International voyages
Still remotely controlled
Are we prepared?

- International Framework?
  - Yes

- Adapted portfacilities and services?
  - Yes

  “This will be the next man on the moon for the Port of Rotterdam,” predicts Erwin Rademaker, the program manager charged with ensuring that Europe’s largest port can accommodate autonomous ships by the year 2030.

- Adapted Maritime Spatial Plans?
  - Maybe
Belgian MSP
“Autonomous technology has the potential to revolutionize the movement of cargo on a scale not seen since containerization was introduced some 50 years ago,”

Captain Andrew Kinsey, senior marine risk consultant at AGCS.