Maritime and Inland Waterways
Panel Discussions Results Summary

EGNSS User Consultation Platform Plenary

4th December 2018
Agenda

• Highlights of Main Trends in the Market
• Recommended Refinements of User Requirements
• User Requirements for New/Emerging Applications
• Research and Innovation Priorities
• Discussion on Enhanced EGNSS Services
• Feedback on Back-up PNT Solutions
Highlights of Main Trends in the Market

• Autonomous vessels (manned and unmanned)
• Resilient PNT
• Sensor fusion
• SAR beacons with return link capabilities
• Cybersecurity / Authentication
• Drones to support surveillance
Recommended Refinements of User Requirements

• SAR
  • AIS enabled beacons
  • Final rescue stage requires accuracy down to 1 m
  • Remote activation of beacon

• Inland Waterways
  • Bridge collision warning requirements
    • Horizontal accuracy of 20 cm
    • Vertical accuracy of 10 cm
    • Heading of 0.3 degrees

Source: Moblit / SINSIN
Recommended Refinements of User Requirements

• Navigation in Ports
  • Horizontal accuracy of 5 cm at the last stage of berthing
  • Berthing impact speed needs to be below 0.2 knots

• Vessel to vessel operations
  • Multifrequency / Multi-constellations
  • Integrity
  • High Accuracy
  • Authentication of the augmentation system
  • Standardised communications
Recommended Refinements of User Requirements

• Port container terminal operations
  • Straddle carrier requirements
    • Horizontal accuracy for navigation of 1 m (but 20 cm accuracy is required when entering in a specific row to handle containers)

• Container handling requirements
  • Centimetre accuracy is needed for the container operations e.g. lifting the containers
  • Vertical accuracy of 2 m to identify the level that the container is located in the stack
Recommended Refinements of User Requirements

• Market challenges
  • Increase efficiency: Fuel costs and crewing costs are the main drivers (70-80% of total costs on merchant ships). Fuel costs also very relevant for IWW. More efficient navigation is important.
  • Cybersecurity is a major threat in maritime

• Research priorities
  • Short term:
    • Enhance confidence that GNSS system is robust = addressing jamming and spoofing (e.g. Galileo authentication)
    • Fuel consumption optimization
    • Special topics with focus on SMEs
  • Long term:
    • Unmanned vessels and how do they integrate into mixed traffic
Research and Innovation Priorities

• Main barriers
  • Regulation can be a barrier for innovation and the use of new technologies but also an enabler, in case regulations require a certain performance/technology

• Most relevant EGNSS services
  • Galileo OS-NMA – greater security and accuracy in the service could be a differentiator
  • Return link services and their evolution are very relevant for SAR

• Synergies with other technologies
  • Copernicus for forensics, surveillance and mapping
  • Sensor/data fusion is important e.g. lidars
Discussion on Enhanced EGNSS Services

ARAIM

• RAIM is already implemented in maritime receivers
• With respect to ARAIM, no feedback was received

High Accuracy Service (20 cm)

• Bridge collision warning requirements for IWW
• Automatic docking and auto-mooring
• Container terminal operations
Feedback on Back-up PNT Solutions

- There is a high dependency on GNSS in maritime
- With respect to back-ups for positioning, IALA already published a recommendation on the requirements for these systems R-129
- Back-up for timing and synchronisation needs to be further analysed. There is a proposal to request IALA to consider the potential review of this recommendation
Thank you !