Emerging Technology in Maritime Piloting

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Technology is Everywhere

- Autonomous cars
- Autonomous ships
- VR/AR
In maritime, we’ve successfully incorporated some new technologies

- Carry-on Portable Pilot Units (PPU’s)
- Smart Phones / tablets
But...are we optimizing technology to create a better way to pilot ships?

Or are we simply layering technology on the old ways and calling it a day?
Maritime Piloting – What?
“Control of a complex system”

- **FEEDBACK** - Pilot gets feedback from many different sources

- **CONSTRUCT** - Based upon his/her understanding of the controlled system (knowledge), the pilot compares the present state to the desired state

- **CONTROL** - Pilot takes action (uses his/her skills) to achieve or maintain the desired state
Maritime Piloting – What?
“Control of a complex system”

• FEEDBACK - Pilot gets feedback from many different sources

• CONSTRUCT - Based upon his/her understanding of the controlled system (knowledge of where the ship needs to be), the pilot compares the present state to the desired state

• CONTROL - Pilot takes action (uses skills and tools) to achieve or maintain the desired state
Traditional Feedback

• Primarily visual and sensory
• Some reliance on instruments (e.g., Radar, AIS, gyro compass)
• Other telemetry (rudder angle indicator, E.O.T., anemometer, extended alarm system, etc.)
• Ship’s crew
Non-Visual Feedback

• With technology (primarily PPU’s) - pilots are increasingly their reliance on information that can be received via a computer screen or other similar instrumentation to augment or replace visual feedback.

• A pilot’s comment about using PPU’s: “I’m a better pilot with it.”
So . . . What Next?

Using this new technology (PPU’s etc.), can we safely pilot ships in zero visibility?

• Use tech to replace visual feedback?
• What management measures would be necessary?

• Note: The pilot would still have access to onboard instruments, telemetry and feedback from the ship’s crew
Could we use tech to provide shore-based assistance to support the on-board Pilot?

- Shore-based copilot
- Minimize human error
- Double-check during higher risk ship moves
- Second set of eyes
Could pilots use tech to provide navigational assistance to masters entering port with no pilot onboard?

- Shift pilot boarding closer to shore (or inside port limits?)
- Improve pilot safety during weather events
- Reduce delays during weather events
- Decrease emissions and idle gangs
- Mitigation measures?
Could we use tech to remove the pilot to a remote location?

- Complete transit?
- Partial transit?
- Under certain circumstances?
- What management measures would be necessary?
What Else is Possible?

Assuming our objective is to improve marine safety and efficiency . . .

In what ways might we integrate this and other emerging technologies into our day-to-day business?
Thank You

Questions

Emerging Technology and Maritime Piloting
The Technology is here; how should we utilize it?
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http://csum-dspace.calstate.edu/handle/10211.3/142084