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**Fwd: Autonomous Vessel Operations and Potential Implications for Safety**

1 message

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**Peter Gilson** <petegilson@aol.com>

Tue, Jan 23, 2018 at 12:29 PM

To: Cheryl Chisholm <mbyca.cpc46@gmail.com>, Paul Dubiel <pdubiel@nemf.com>, Carolyn Bargoot <bargoot@yahoo.com>, Ted Chisholm <etchisholm@yahoo.com>, Bill Scanlon <bostoncaptbill@yahoo.com>, Russel Hoy <a-hoy@comcast.net>, "petercaten@gmail.com" <petercaten@gmail.com>, Peder Acres <pederacres@yahoo.com>

Good afternoon,

Please include in the package for the general meeting.

Thank you!

Begin forwarded message:

**From:** scott white <whitesc1@gmail.com>

**Subject:** Autonomous Vessel Operations and Potential Implications for Safety

**Date:** January 23, 2018 at 7:24:50 AM EST

**To:** "Cutter, Mark" <Mark.E.Cutter@uscg.mil>, "bwellock@massport.com" <bwellock@massport.com>, "Captain Mike Peddle (Boston Pilot)" <mpeddle@bostonpilots.com>, "Captain Richard Stover (Boston Pilot)" <rstover@bostonpilots.com>, "cheeversj.bpd@cityofboston.gov" <cheeversj.bpd@cityofboston.gov>, "Dave Cox (Boston Marine Society)" <captdecox@comcast.net>, "Denning, Matthew J CDR" <Matthew.J.Denning@uscg.mil>, "easternpointp@aol.com" <easternpointp@aol.com>, Ethan Maass <emaass@seatow.com>, "GeorgeL@reinauer.com" <GeorgeL@reinauer.com>, Jamy Madeja <jmadeja@buchananassociates.com>, "mcgovern@bostonems.org" <mcgovern@bostonems.org>, "mmccabe@bostonpilots.com" <mmccabe@bostonpilots.com>, "Newcomb, David T LCDR" <David.T.Newcomb@uscg.mil>, "OConnell, David E CDR" <David.E.OConnell@uscg.mil>, "Patrick Moran, (Major MEP)" <PATRICK.MORAN@state.ma.us>, Paul Milone <PMilone@weymouth.ma.us>, "petegilson@aol.com" <petegilson@aol.com>, Scott White <whitesc1@gmail.com>, "spalmer@moranshipping.com" <spalmer@moranshipping.com>, "Steven.waldron@boston.gov" <Steven.waldron@boston.gov>, Walter Hope <walterhope28@gmail.com>, "wmchugh@salempd.net" <wmchugh@salempd.net>, "amontanezjr@comcast.net" <amontanezjr@comcast.net>, scott white <scott.white1@hq.dhs.gov>

This is a good piece . . . .

*Editor's Note: Capt. Benjamin Hawkins, chief of the Office of Design and Engineering Standards, participated in the panel session "Autonomous Vessel Operations and Potential Implications for Safety" during the 97th Annual Transportation Safety Board meeting in Washington, DC, Jan. 7-11, 2018. Kevin Kohlmann with the Maritime Administration moderated the session. Hawkins was joined on the panel by Tracey Mayhew with the Paul Hall Center for Maritime Training and Education, Todd Lewis Ripley with MARAD, and John M. Jorgensen with American Bureau of Shipping.*

*Following is a condensed version of Hawkins's prepared remarks. The remarks are not 'as delivered' but provide a the highlights in the 'panel-conversational' style.*



"I'm here to talk to you a little bit from a regulatory perspective regarding autonomous vessels. First, it's important to realize that advancements in technology have been enhancing the autonomy of vessels for decades. Consider the size of a modern ship's crew and its technology compared to that of a ship from the 1950s or 1960s. The engineering crew aboard a steamship pre-1960 would have had 10 men just to run the engineering plant. Now, through automation and advances in remote control that number is cut in half.

As this technology developed, regulators recognized the relationship between automation and manning. In the 1960s, the U.S. Coast Guard published the first guidance on automation and its use to reduce engineering crew sizes. Later, in the 1980s, the International Maritime Organization issued international standards for unattended engine rooms. In each case, the change in the regulatory framework was shaped by the technology that preceded it, so the regulatory developments lagged behind the technological advancements.

The development of international standards for Global Positioning Satellites provides another example. The first satellite was launched in 1978, but it took over 30 years for international standards associated with GPS technology to enter into force. Compared to GPS systems, the prospective of vessel autonomy is exponentially more complex, and there are a broad spectrum of issues to address before a comprehensive regulatory solution is implemented. So, it is going to take time to develop any necessary standards and regulations.

When it comes to charting a course to develop those standards and regulations, the advancement of vessel autonomy presents several new challenges for ensuring the continuity of safety and security in the Marine Transportation System. These challenges include consideration of stakeholder concerns, the regulatory framework, industry practice, and eventually specific regulatory standards. These are complex challenges with many factors to consider in order to ensure the safe deployment and implementation of autonomous technology.

In examining these challenges, it is worth exploring three elements through which we ensure safety and security. The first concerns the human element. One of the principle drivers for autonomous technologies is the potential for reduction in human error. However, the human element, via the licensed mariner, has always been central to ensuring safe maritime operations. This element, in turn, has been complimented by standards and operational limitations. These three elements have always worked together to ensure safety, security and environmental protection. However, as the role of the mariner continues to evolve with the use of autonomous technology, it is essential that we consider what adjustments to standards and operational limitations are necessary.

This is complicated in that our existing regulatory regimes were developed with the assumption that licensed mariners are on board. This means that as autonomous technologies continue to alter the interaction of mariners with shipboard systems, we must address some fundamental questions underlying our regulatory regime to assess the impact of real or prospective changes created by these new technologies:

1. What changes are going to be necessary to regulatory regimes to ensure they are relevant and applicable?
2. Will existing authorities be sufficient?
3. What about terms and definitions, much less the applicability of existing standards?
4. Having considered such fundamental issues, do we need to change or refine the underlying standards themselves?
5. Can we implement an adaptable and resilient framework that is responsive to further innovation?
6. Can we develop and deploy consensus standards in a more timely fashion to support the evolution of technology while championing safety and security?
7. How can longstanding, internationally accepted standards continue to ensure the safety of navigation?
8. How can we validate and verify that the technologies that enable autonomy are sound, resilient and sustainable?



Consider this example: the ship's lookout is a role mandated by international regulations. The question is not simply what equipment needs to be installed in place of the mariner. We first have to assess what constitutes a lookout – both in statute and practice. Then we need to figure out what the performance standard is so we can identify viable technological alternatives and an equipment approval process that validates an acceptable level of safety. The implication is clear: this is going to take time.

So, what is being done in this regard?

As with many of the regulatory standards developed for the maritime industry, these regulatory discussions are occurring at an international level spurred on by a submission to the International Maritime Organization by Denmark, Estonia, Finland, Japan, the Netherlands, Norway, the Republic of Korea, the United Kingdom and the United States. The result of this submission was the initiation of a regulatory scoping exercise, the aim of which is to assess how autonomous technology will fit within the existing international conventions. This exercise is supposed to start in May and conclude in 2020.

The scoping exercise itself is not intended to create or amend any international standards; it is simply intended to identify where there's alignment or conflict within the existing standards. Of course, we do expect there will subsequently be development of an appropriate standards regime. As things take shape internationally, we know they will certainly inform regulatory development here at home.

In the meantime, existing authorities that allow the Coast Guard to regulate vessels, credential mariners, verify compliance and manage the waterways, provide significant latitude for accepting unique and novel designs and approving equivalencies to those regulations. Therefore, during the early development and deployment of autonomous technology, the Coast Guard must leverage its existing authorities to ensure the safe development of those technologies. That said, long-term regulatory solutions are certainly envisioned but are well over the horizon. Comprehensive regulatory development will be preceded by voluntary guidelines and consensus standards as well as international standards and industry best practices.

With that in mind, it is worth noting that U.S. Coast Guard resources involved in new projects related to autonomous technologies are going to span local, regional, and national authorities. It cannot be overstated how important it is for anyone who is envisioning autonomous operations to start a conversation with us early, especially at the local level. Early communication is essential if the Coast Guard is to exercise discretion under existing statutes and regulations.

[http://mariners.coastguard.dodlive.mil/2018/01/22/1-22-2018-coast-guard-remarks-on-autonomous-vessels-at-the-transportation-research-board-annual-meeting/?utm\\_source=feedburner&utm\\_medium=email&utm\\_campaign=Feed%3A+MaritimeCommons+%28Maritime+Commons%29](http://mariners.coastguard.dodlive.mil/2018/01/22/1-22-2018-coast-guard-remarks-on-autonomous-vessels-at-the-transportation-research-board-annual-meeting/?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+MaritimeCommons+%28Maritime+Commons%29)

*Best Regards,*

**Scott C. White**

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