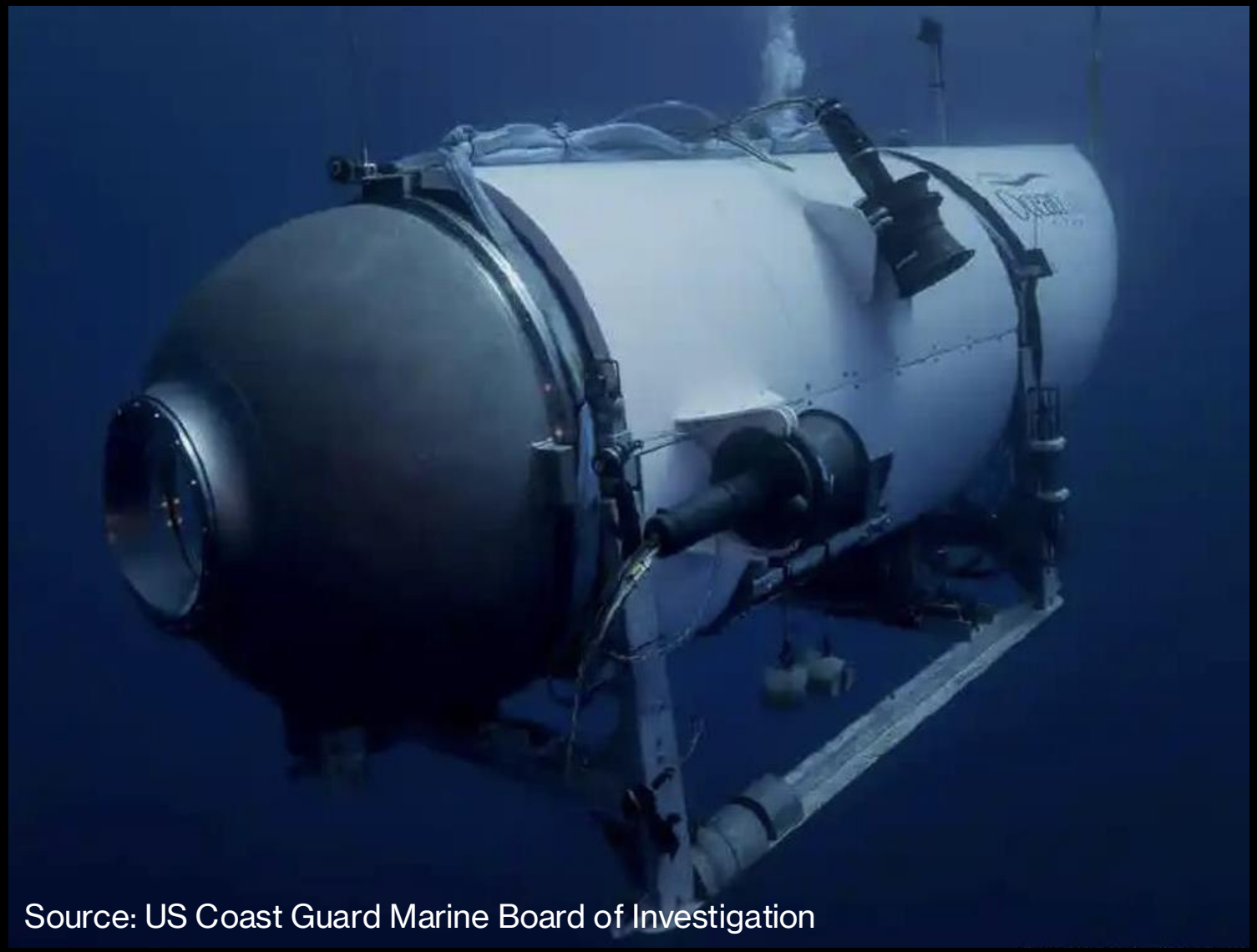


Source: US Coast Guard Marine Board of Investigation

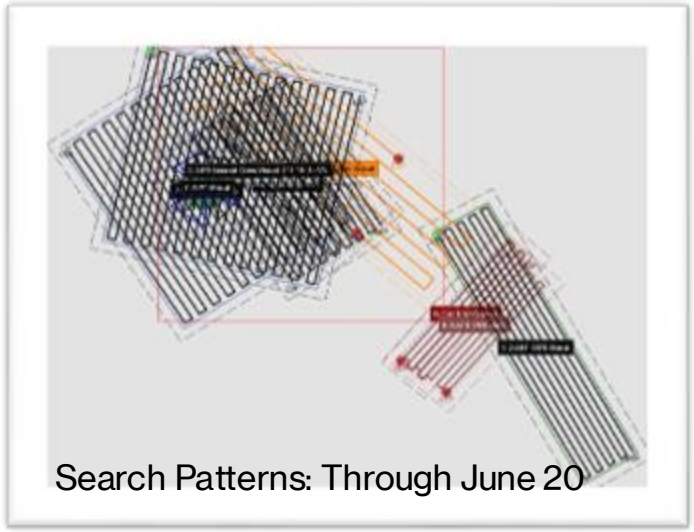
DEFCON 33:

The Ultimate Hack, Applying Lessons Learned from Titan to Maritime Cyber

RADM John Mauger, USCG (Ret.)

Principal and Founder, PORTS LLC



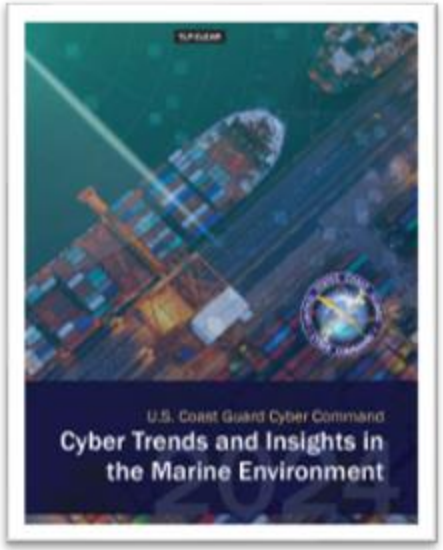


Search Patterns: Through June 20









The Search



Titan: The World's Oceans are divided into Search and Rescue Regions...



St John's
Quebec
New Brunswick
Montreal
Maine
Nova Scotia
Halifax
BOSTON SRR
Albany
Gulf of Newburyport
Boston
Providence
New York
Submersible Titan LKP
41-43.980N 049-56.900W

Photos courtesy of PRS

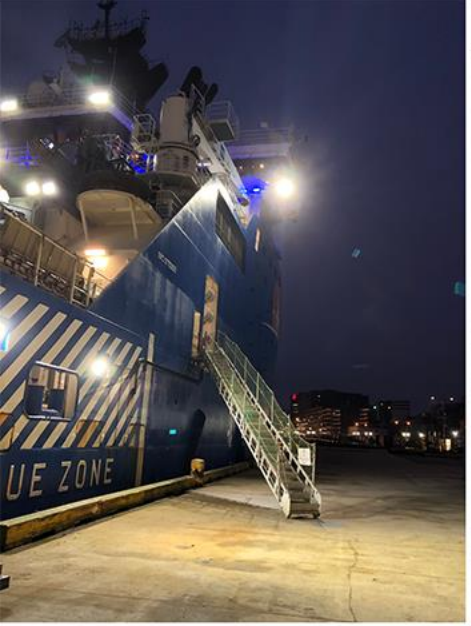




















Photos courtesy of PRS

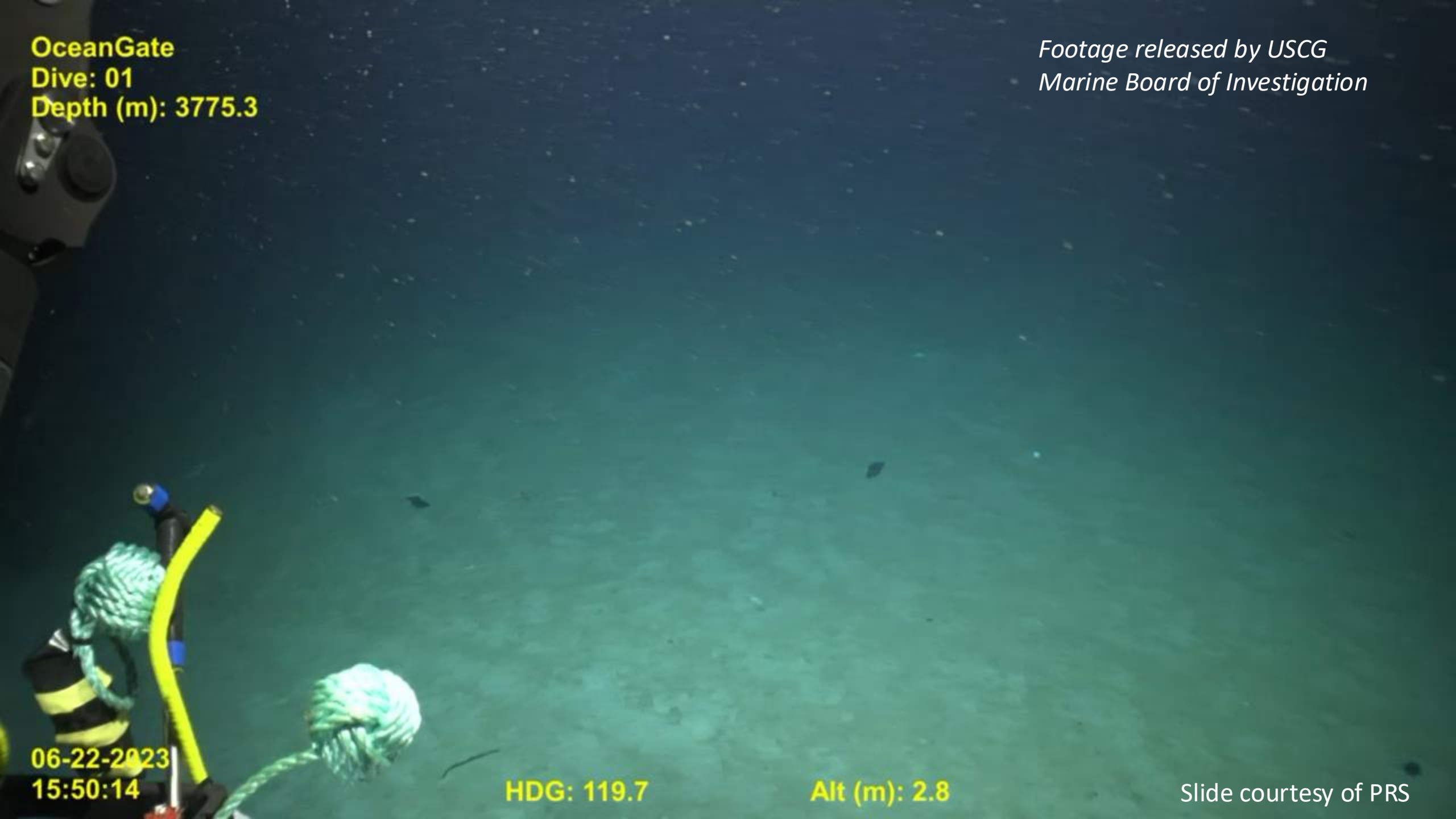
Slide courtesy of PRS

Thursday, June 22

At **10:15**, Odysseus reaches the ocean floor at 3835m rigged for rescue with lifting kit, spare USBL transponders, and a coordinated rescue plan…

Slide courtesy of PRS

Shortly after reaching the seafloor, debris from the Titan submersible was discovered. We continued to search the area and document the full scope of the debris field.



Footage released by USCG Marine Board of Investigation

Slide courtesy of PRS

The Investigation



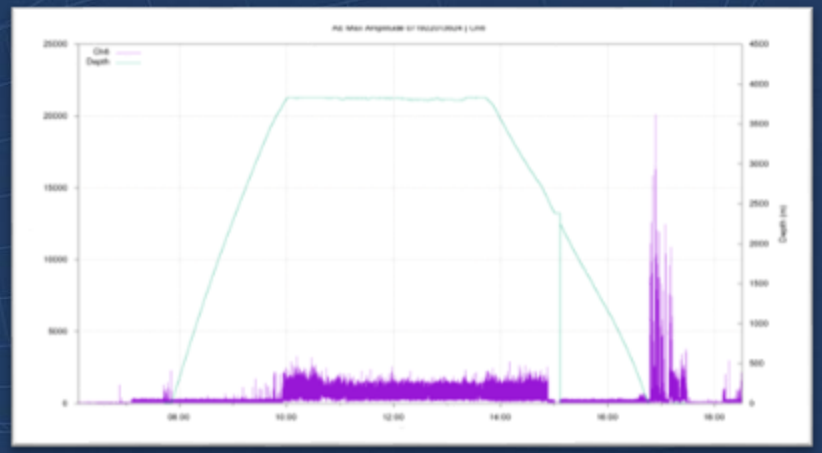

OceanGate EXPEDITIONS

2023 Mission Specialist Crew Agreement

Titanic Survey Expedition Summary

OceanGate Expeditions Ltd., a company organized under the laws of the Commonwealth of The Bahamas, will conduct a submersible dive expedition to the wreck site of the RMS Titanic as a series of missions that are expected to begin in May 2023, and launch from ports in the U.S., Canada, and/or St Pierre and Miquelon. Dives to the wreck will be conducted aboard Titan, OceanGate Inc.'s human occupied submersible capable of taking up to five crew members as deep as 4,000 meters.





Evidence Highlights Key Contributory Factors

Exploiting Seams in International Regulations

Designation of ‘passengers’ as ‘Mission Specialists’ was likely used to avoid U.S. law and international regulations for passenger operations.

Inherent Weaknesses in the Containment

The carbon fiber pressure hull had inherent gaps and weaknesses baked into the design. Repeated stress would breach the hull.

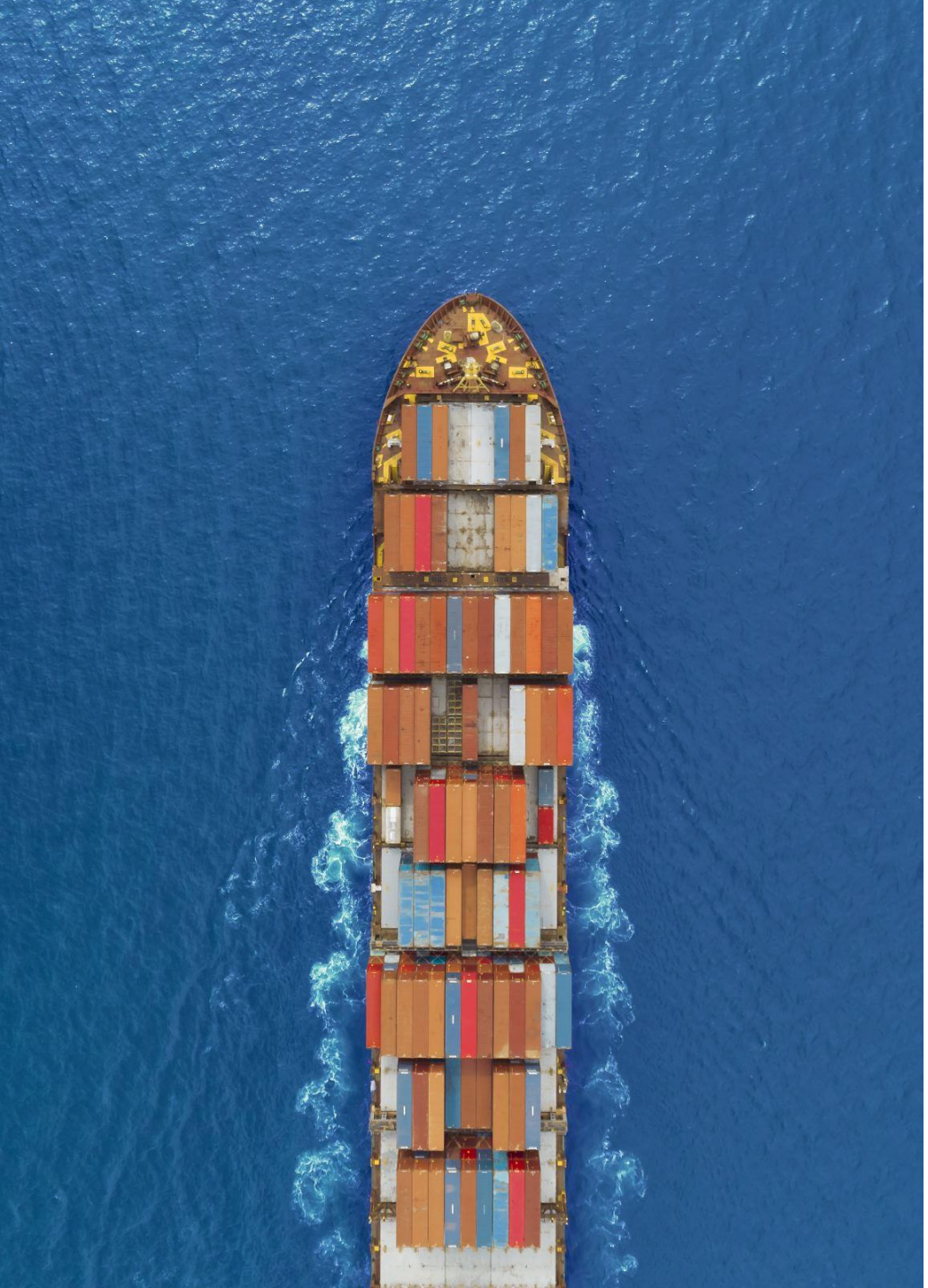
Acoustic Monitoring Dive 82 (Titanic) - July 2022

Limited Reliance on Active Monitoring

The acoustic sensors appeared to detect potential fractures in the fibers and resin, but the signals were ignored.

Why Maritime Matters





Ships transport 90% of global trade

Maritime transport contributes $5.4T annually to U.S. GDP

Maritime trade is vital to the U.S. economic and national security.

Maritime 5.0 = ‘Always Connected’ and ‘Fully Digital’

The drive for efficiency, sustainability, and technological adoption is rapidly changing the maritime industry and creating new business models and new vulnerabilities.

Maritime cybersecurity is not keeping pace

Complex international framework, diversity of equipment suppliers, and lack of risk awareness has limited the adoption of maritime cybersecurity measures.

Experts Agree: It's All Hackable

"The 'air gap' that once protected vessels and physical infrastructure from attack has now closed."

– **DNV Maritime Cyber Priority 2024/2025**

"In 2024, we were engaged in our first ransomware incident in which shipboard networks were included in the ransom encryption phase."

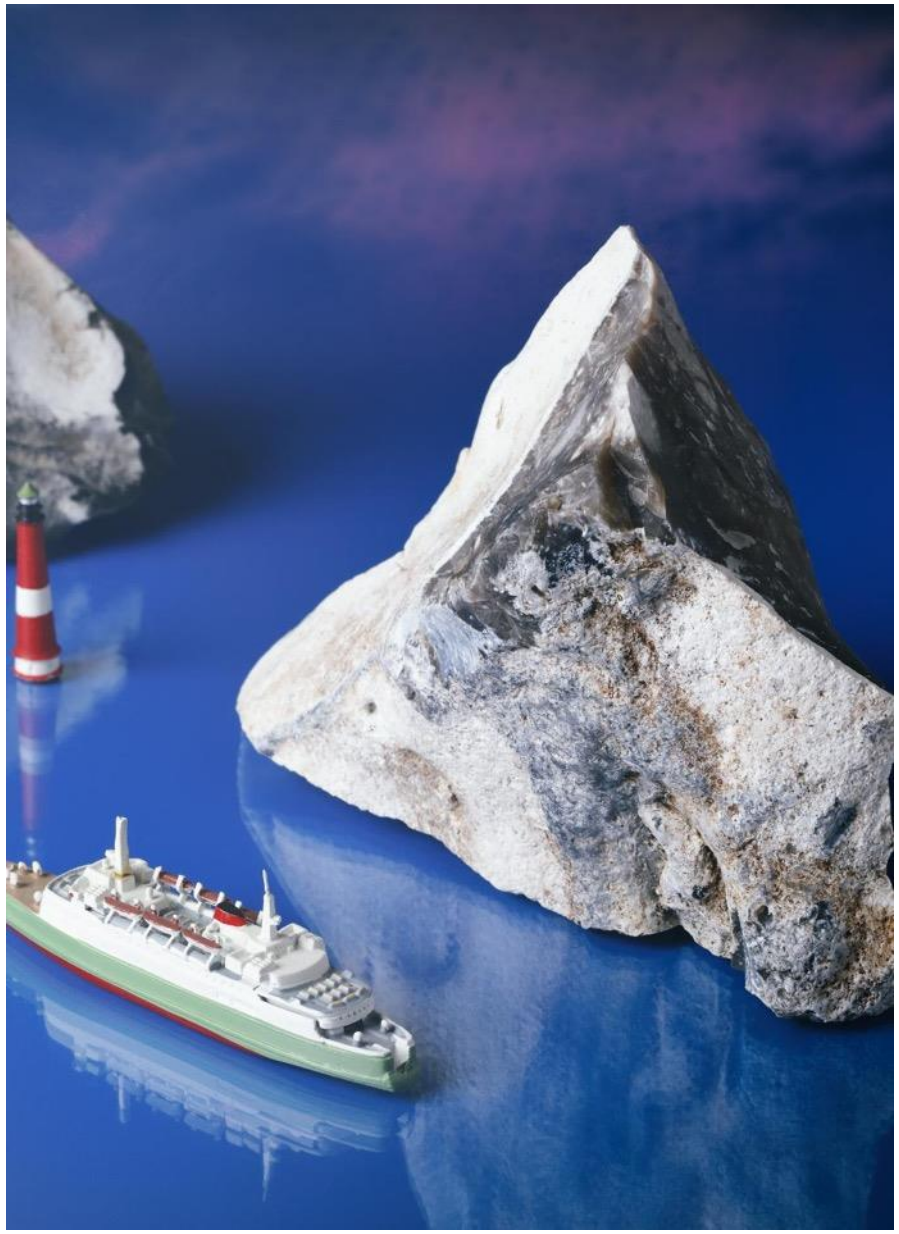
– **USCG Cyber Command Cyber Trends in the Maritime Environment (CTIME) 2024**

"The average cost of a data breach**: $4.88 M**... 70% of breached organizations reported significant disruption."

– **USCG CTIME 2024**







Reports From US Coast Guard and DNV Warn of Systemic Vulnerabilities

“Default Credentials… were detected and leveraged in 71% of missions… [this] remains alarming as it continues to offer adversaries attack vectors.”

– **USCG CTIME 2024**

“More than half of the partners with OT network segments had an incorrect understanding of their OT network segmentation… assessments proved these assumptions incorrect.”

– **USCG CTIME 2024**

“Organizations may think they have adequate response plans in place, but without testing them with exercises they are just theoretical.”

– **DNV Maritime Cyber Priority Report 2024-2025**

Titan’s Lessons





TITAN Evidence	Implications for Maritime Cybersecurity
Exploitation of seams in International regulation	Less than 1% of the world's ships are covered by specific cybersecurity regulations
Inherent weaknesses in containment design	Vendor equipment and network security haven't kept pace with rapid connectivity
Limited reliance on active monitoring	Less than 1/3 of global ship networks are actively monitored

Your Help is Needed!



Questions?



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