The Maritime Safety & Security Center:

CYBER SECURITY RISK AND COMMERCIAL SHIPPING
What’s the **CYBER RISK**?
We Really *Don’t Know* for Sure ...  
Modern Technology Changes with the Speed of Light ...So Does the Risk ...
Some of the Known Risks: GPS Spoofing; Control Systems Corruption ...OTHERS?

**RULE OF THUMB:**  
OLDER VESSELS are Less Cyber Vulnerable then NEW VESSELS –  
Simpler Mechanical Control Systems vs Fully Integrated Electronic Control Suites ...  
**SIMPLE/REDUNDANT/EASY TO FIX** is **STILL BEST**

**TREND IS TO 100% AUTOMATION:**  
SHOULD WE REALLY BE CONSIDERING ELIMINATION OF THE HUMAN ELEMENT FROM ACTIVE ENGAGEMENT IN SHIPS SYSTEMS?
EXAMPLES:

US NAVY CANES SYSTEM
- Consolidated Afloat Networks and Enterprise Services – an Integrated System of Systems linking weapons control, classified and unclassified info systems;

L-3 NACOS Platinum System

L-3 Marine Systems

“The NACOS Platinum navigation systems each comprise X- and S-band radars linked to a series of five multifunction Multipilot workstations for centralized control of all main radar, ECDIS and conning operations, in addition to those for automatic steering, track control and voyage planning. The scope of supply includes AIS, VDR, differential GPS, Doppler log, echosounder and wind/weather navaids, as well as a bridge navigational watch alarm system (BNWAS). Associated communications facilities cover a full range of GMDSS A3 equipment, inclusive of a KVH TracPhone FB500.

The design architecture also provides the integration of a fuel-efficient vessel performance system to reduce emissions from shipping vessels and associated running costs. NACOS Platinum supports a full range of remote access and diagnostic functions.”

The NAVY:

“CANES is a single integrated system, but it’s not a single network, it’s three: one unclassified, one secret (SIPRNet), and one top secret (JWICS). Consolidating from five or 41 networks down to three should increase efficiency, but without creating the vulnerabilities of having everything connected on a single network.” yet, “Even with CANES installed, however, classified and unclassified data streams still cross over in surprising ways. The Navy transmits information between its ships and operations centers ashore using something called ADNS, the Automated Digital Network System.”

ARE WE MAKING IT HARDER ... OR EASIER ???
WHAT’S COMING? The VALUE PROPOSITION FOR INDUSTRY looks to MAXIMIZE EFFICIENCY and REDUCE COST – A FUNCTION OF MANAGED RISK
... but to Manage Risk, We need to Know How to Describe and Define it ...

Industry makes Business Decisions by Balancing Risk vs. Return on Investment
INDUSTRY WILL IMPLEMENT SOLUTIONS MANDATED BY REGULATION and BASED ON DEMONSTRABLE RISK; WITH TECHNOLOGY - THEY OFTEN FOLLOW THE LEAD OF THE MILITARY – i.e. DARPA, ONR, USCG R&D
TO BE EFFECTIVE, REGULATION MUST BE GUIDED BY EDUCATION & DETERMINATION OF FACTS - AND A POLICY THAT INCLUDES INDUSTRY AS AN EQUAL PARTNER.

MORE RESEARCH & TESTING NEEDED TO VALIDATE VULNERABILITY ASSUMPTIONS & DEFINE VALUE ADDED SOLUTIONS

HOW ABOUT PRACTICAL TESTING ON MARITIME ACADEMY TRAINING SHIPS AND MSC VESSELS AS A NEXT STEP?
THANK YOU !!!
ANY QUESTIONS ???

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