

### ADAPTIVE MARITIME CYBER RISK ASSESSMENT AND MITIGATION

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## Why dynamic and adaptive?



### https://www.shipmap.org/





MaCRA uniquely provides dynamic, multi-dimensional risk assessment tooling, uniquely addressing **IT and OT** elements, but also taking into account **environment and physical movements**.





### MaCRA in the Plymouth "ecosystem"



Shipping operators (civil and defence), equipment manufacturers, regulators, insurers



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### Cyber-MAR-EU Horizon 2020 project

- €6 million cyber preparedness project for a holistic approach and awareness in maritime logistics supply chain
- Focused on ports
- Innovate simulation environment combines knowledge-based decision support with, novel risk analysis and econometric models
- 13 Maritime logistics organisations building cyber awareness and validating business continuity management
- Why ports? Losses of up to £90 billion—recent hypothetical cyber attack on 15 major ports across Asia Pacific (Lloyd's)



HORIZON 2020



## Dynamic throughput assessment

• Pulled in expertise in cargo ship and container port operations





# **Securing Maritime Supply Chains**

- Vessels play crucial role in global supply chains and so securing them is of paramount importance.
- There is a need to understand not only how different exploits could affect vessels but also how cyberattacks affect the port and the wider supply chain.





# Cyber-Attacks – What's at Risk at the Micro and Macro Scale?

- Potentially cause a vessel to lose access to on-shore services (no comms)
- Potentially lose access to electronic devices on-board the ship which are used for navigation or for safety purposes
- On-shore (i.e. Ports), potential consequences = disruption of port operations -> disruption of the supply chain.



# **Securing Maritime Supply Chains**

In order to understand the true risk faced, we need to have an understanding of the level of disruption that would be suffered if particular cyber-risks of concern were to materialise

Simuluations of port operations are used to gain an understanding of how different events would affect the throughput of cargo through ports. This helps estimate the disruption to port operations and hence helps us estimate the overall disruption to the supply chain. This information can then also be used to better inform the risk assessment process.





# **Tackling The Cyber-Risk Challenge**

**Direct Approaches:** 

- Hardening IT/OT systems
- Improving Training for personnel
- Regulatory Changes (from IMO and the like)



# **Securing Maritime Supply Chains**

**Indirect Approaches** 

• Risk Sharing: Investigating the potential role of the Cyber-Insurance market in the maritime sector. This will allow players in the maritime space to adequately hedge against cyber risk.

• Projects such as Cyber-MAR have the aim of quantifying the effects of cyber-attacks and proposing models that would aid in facilitating the above.



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https://www.plymouth.ac.uk/research/maritime-cyberthreats-research-group

