

Coastal Cities Summit: Values and Vulnerabilities National Center for Maritime and Port Security Panel Abstract

Risk and Vulnerabilities: Comprehensive Maritime Domain Awareness Systems (MDAS) in Maritime and Port Environments.

The vast majority of international commerce moves via the oceans and waterways. The ability to monitor these waterways, protect people and infrastructure, and react to the broad range of threats is crucial to the world economy and ecology. The complex nature and variance of the size, shape, location, and functions of international ports along with the ever-growing complexity of international regulations associated with commerce make the task of maritime and port security challenging at best. The key to Maritime and Port Security is the ability to gather data used to produce information which in turn is transformed into knowledge that can be acted upon. SRI International's National Center for Port and Maritime Security (NCMPS) is focused on the areas of research and development related to reducing risk and vulnerabilities of the world's ports via the development of a comprehensive Maritime and Domain Awareness System that facilitates the data acquisition required for knowledge-based actions. NCMPS areas of focus in the development of a comprehensive MDAS include: Policy considerations, Access Control, Supply Chain Integrity, C4ISR, Environmental Data, and Training and Education.

Policy Considerations

A crucial element in the process of protecting the maritime domain, including national ports and waterways, is Maritime Domain Awareness, the combination of Maritime Domain Intelligence and Maritime Domain Situational Awareness. SRI, St. Petersburg's National Center for Maritime and Port Security is focused on research and development aimed at reducing vulnerabilities of the world's maritime domain, including its ports, through development of a comprehensive Maritime Domain Awareness System facilitating data and information acquisition required for knowledge based actions. Whether considering the challenges of

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maritime domain protection on either an international or national basis, the fact remains that policy considerations are of fundamental, and often underestimated, importance. For example, the U.S. Safe Port Act of 2006 mandates 100% container scanning for radiation of all containers bound for the United States after 31 December 2008. That mandate has encountered resistance from foreign governments as well as foreign ports and shippers. Money, equipment and delays in the flow of commerce are the ostensible reasons for objection. Obviously, sovereignty is an underlying issue requiring more than passing attention. Motivation for foreign governments to comply with the law is still in early stages of implementation.

Access Control

Key to maritime security is the ability to maintain access control of critical infrastructure, key resources and the waterways. Included in this approach is limiting landward port entry only to authorized personnel, vehicles and rail cargo and the screening of cargo arriving by ship; especially cargo from foreign ports of call. On the waterside, securing the approach to facilities alongside or on the water's surface, as well as under the water's surface, is compounded by the number of unregulated recreational watercraft and the lack of standoff distance from facilities to channels that must remain unimpeded. Situational awareness provided by technology enhances access control enforcement and violation responses.

Supply Chain Integrity

Supply chain integrity via container tracking and security is a global challenge requiring the employment of numerous approaches to develop adequate solutions. While myriad security measures ranging from RFID reporting to GPS tracking and physical detection of container breaches are available, no one solution will cover the entire supply chain. The capabilities to

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track, record and transmit position, temperature, humidity, pressure, severe shocks and container breaches are invaluable to the supply chain stakeholders. NCMPS is developing the ability, through its Micro Electro Mechanical Systems (MEMS), facility, to micro engineer a suite of miniature sensors for these measurements.

Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance (C4ISR)

Global economic security and safety depend upon the free and open use of the maritime domain—air, land, sea, space, and cyberspace. Collectively, Maritime Domain Awareness (MDA) is the most effective means of understanding the transnational elements that impact the security, safety, economy, and environment of the global community and marketplace. In this context, MDA is much more than accumulating minutiae, the outcome of many data collection and sharing schemes. The ultimate aim of MDA is to create a sphere in which data is transformed into information, information into knowledge, and knowledge into understanding and correct action. It must be the right understanding by the right people at the right time.

Environmental Data

Observations and predictive models of ocean environmental conditions in the vicinity of ports and harbors are a critical component of any comprehensive maritime domain awareness system. Real-time observations and predictions of winds, waves, currents, water levels, temperature, and salinity are necessary for safe and efficient ship movements in and out of port on a routine basis as well as for detection of anomalies/threats and response to and mitigation of natural and human-induced catastrophes. Such information is most useful when integrated with other data on ship navigation, resources at risk, locations of response assets, and other maritime security information, in a comprehensive decision support tool.

Training and Education

The Training and Education aspect of Maritime and Port security covers the systems operations as well as the integration of policy mandates. The international maritime arena is dynamic in nature and as such requires a responsive approach to designing, developing, and delivering training that meets the needs of the community. Some of the issues associated with training in this arena include: the disparate levels of skill of the recipients, multiple student locations, standardization of response models, incorporation of virtual environments and visualizations in web and alternative delivery device formats.

It is critical that these multiple facets of Port and Maritime security are fully integrated and implemented as part of a comprehensive approach to a Maritime Domain Awareness System in order to reduce the daily threats and vulnerabilities that face our world's ports and in turn the global economy.

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