Port Terminal Surveillance

Protecting Economic Gateways

SYNECTICS

Introduction

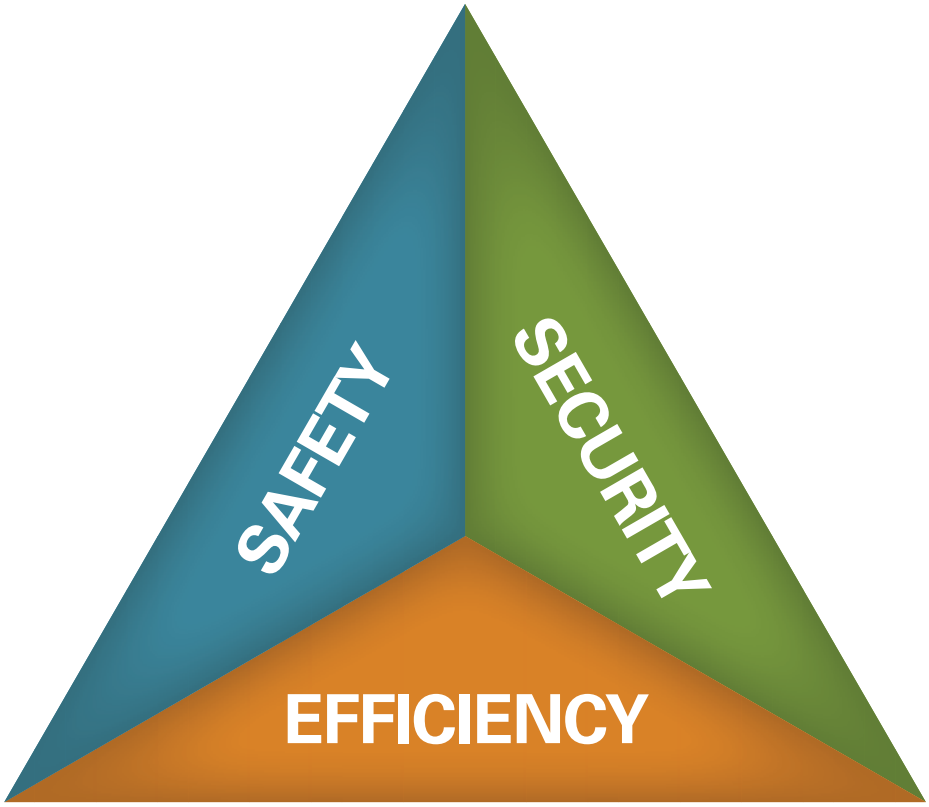
Maritime transport is essential to the global economy - at any one time over 90% of the world's trade is by sea. Through economies of scale, it is one of the most cost-effective ways to move goods and materials between countries and continents. There are over 50,000 international merchant ships, transporting cargo of every kind, registered in over 150 nations.

Ports are the gateway to this vitally important international marketplace making them a critical component of our global trade infrastructure.

The challenges they face are significant. In addition to accommodating ships of ever-increasing size, particularly since the rise of the ULCV (Ultra Large Container Vessel), ports are under pressure to keep container exchange processes fast-moving, efficient, and secure. For example, in 2015 the Chief Executive of Maersk Line suggested that port terminal operators should be aiming to handle around 6,000 containers per day.

Given the magnitude of these demands, any form of disruption to port operations – whether through deliberate attack, theft, equipment damage, safety breach, or inefficiency – can be disastrous, making the need to focus on threat detection, prevention, and reaction vitally important.

In this white paper, we explore this need in greater depth and look at how surveillance technology can be utilized to protect the people, products, and processes based in, or passing through, ports across the globe.



Ports require a three-pronged approach to protection. A pyramid that incorporates measures that address efficiency, security, and safety.

The Pyramid of Port Protection

1 Efficiency Driving Efficacy

In addition to calling on ports to 'up their game' in terms of efficiency, Neil Davidson, Chief Executive, Maersk Line, is also quoted as saying that many terminals built just a decade ago are already not fit for purpose because of the need to process larger ships, and cargo volumes, at increased speed.

To avoid becoming outdated and inefficient, ports have been forced to rethink their infrastructure and expand their estates accordingly. Recouping the costs associated with such investment, through leaner, 'smarter' operations, has become an industry imperative.

Enforcing stringent procedures, reduced workforces, streamlining of shore-side processes, and incorporating legacy technology with new innovation, are all systematic of a lean operational model.

Put simply, in order to be effective transport hubs for products and people, ports need to be capable of achieving more with less.

2 Security Protocols Are Paramount

But 'with less' cannot be at the expense of security - ports are, after all, prominent targets for theft, goods tampering/ smuggling or, increasingly, attack.

By its very nature, containerized cargo lends itself to concealed threat. With an estimated global inventory of over 17 million shipping containers, the securing, tracking and inspection of them all individually is exceptionally difficult – especially when a large container ship can carry in excess of 14,000 TEUs (twenty-foot equivalent units).

Given this, and the fact that ports are perceived 'weak links' in the supply chain – based on multiple physical access points, the numerous processes involved in transferring goods, and proximity to human populations – it is clear to see why there is a great deal of pressure on port and terminal operators to take the security strain.

3 Safe Products, Safe People

The final point in the pyramid of port protection is the proactive monitoring and enhanced health and safety. For example, this can include monitoring storage conditions, cargo movements, staff interaction with cargo, and heavy foot-flow areas serving crew, site staff, or passengers.

The following scenarios all pose a potential threat to human safety or to the goods passing through our ports:

- Mislabeled or poorly packed cargo
- Fluctuations in environmental conditions around storage or process areas
- Container leaks
- Deviations in loading/unloading protocols
- Trip and fall hazards developing from stray or faulty equipment
- Congestion (people or vehicles) during peak times

Enabling port and terminal staff to gain a detailed understanding of potential and actual safety issues is a vital component of modern operations.

The Pyramid Paradox

The problem is that these distinct areas are often in conflict.

Transferring goods from A to B in the shortest time possible signifies success in the language of profitable supply chains, yet may prove problematic for enforcing thorough safety and security protocols. Conversely, the delays and costs involved with inspecting all containers individually would make many freight and logistics journeys unfeasible. It is estimated that only 2% of containers entering US ports are physically inspected by Customs for this very reason.

With regulatory demands also in play – such as compliance with ISO 28000:2007, the specification for security management systems for the supply chain, as well as ISO 20858:2007 for maritime port facility security assessments and security plan development – balancing speed, security, and safety is a distinct challenge. This dilemma has been compounded over the years by the fact that ports have typically adopted siloed strategies for addressing these three vital areas. The net result of this has been inefficiency; with increased time, manpower, and monetary costs incurred to manage the individual disparate systems involved.

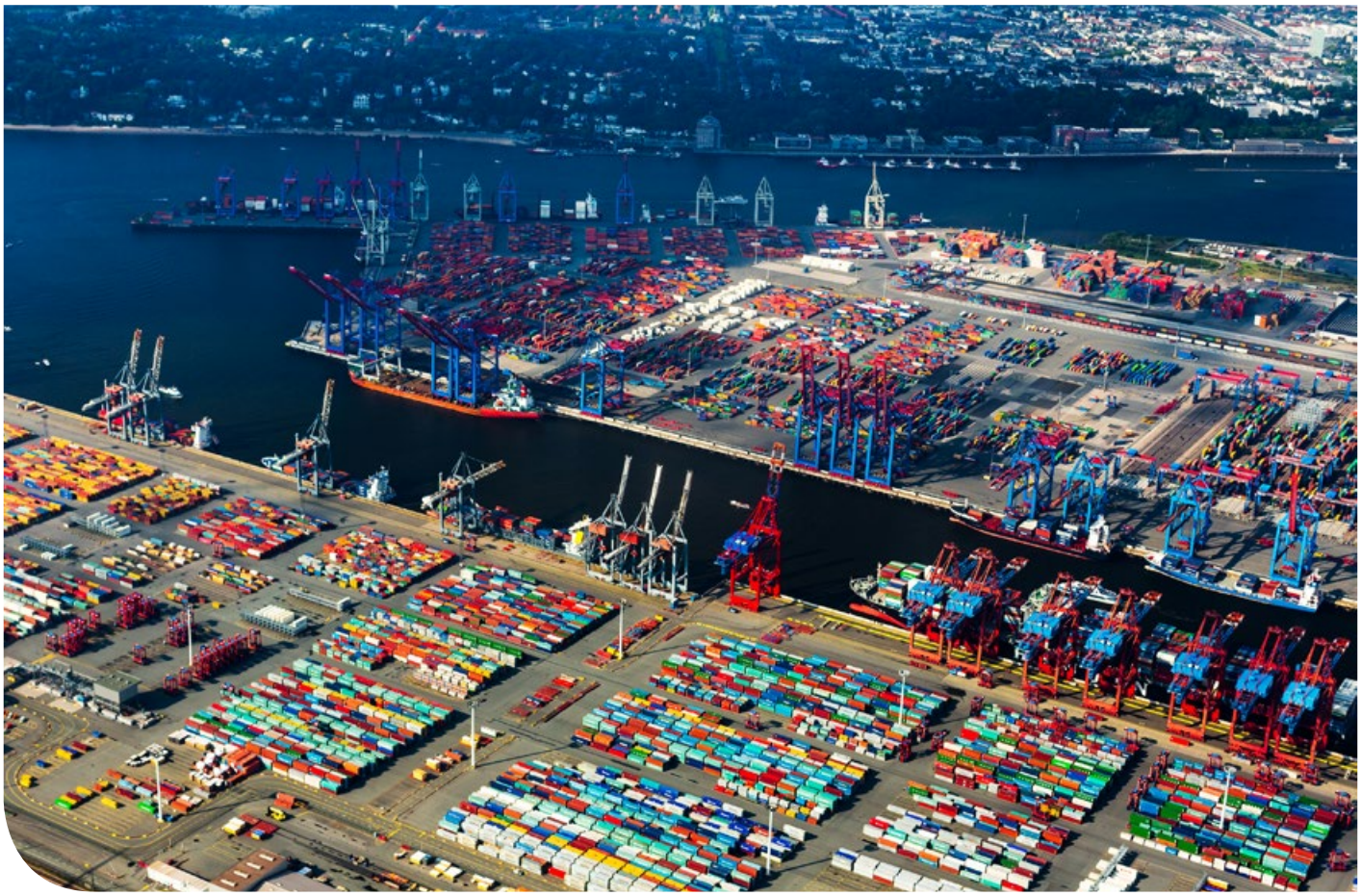
While these three components are dealt with as separate objectives, they will almost certainly remain in conflict.

Achieving Situational Awareness

An integrated approach to port surveillance provides an answer to this conundrum. Instead of looking to adopt different solutions for each individual element of port protection, intelligently integrated surveillance focuses on one goal - complete estate situational awareness.

This is achieved through adopting an open-protocol surveillance command and control platform that allows video (analog, digital, and thermal cameras), intruder alarms, fire and gas detection, access control, critical asset tracking, and site management systems to be integrated, monitored, and managed within a single, unified environment.

In turn, this allows operators in a central control suite, whether concerned with efficiency, security, or safety, to achieve a 360° view of all data and events, and importantly, how various seemingly irrelevant events may relate to each other to signify potential or actual threat. The benefits of this are evident in the following scenario.



Sulphur Shipment -
When Safety Becomes a Security Risk

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An alarm sounds in the port's central command hub as the unloading of a consignment of sulphur commences. In isolation, this is for notification rather than raising awareness of an issue. But what if a man-down alert is also received by operators and air quality readings start to fluctuate?

Together these individual events indicate a potential serious incident – a fumes hazard. The evidence would suggest a problem with the sulphur consignment that needs to be dealt with quickly by safety personnel while emergency responders are guided to the staff member seemingly overcome by gases.

Now, what if the operators also receive an alert generated by an unauthorized card swipe near the bay accepting the sulphur consignment? Cameras also detect 'change of scene' activity in two restricted zones. Suddenly the threat may be to site security as well as safety, and the air quality readings may not be purely accidental. Given the ongoing safety alerts, the integrated system prioritizes events as a potential security breach and prompts the control team to initiate lock-down protocols for the affected areas.

Integrating these different systems into a single command and control platform, together with unified communications, enables the control room team to:

- Rapidly investigate this scenario
- Alert local authorities to evacuate local residents
- Guide emergency service personnel to the 'man down'
- Secure breach zones while further investigation is carried out around the unauthorized card swipe

All these activities and subsequent actions can then be logged against the incident for evidence review and/or training purposes.

Holistic Approach to Port Protection

A holistic approach to port protection ensures that systems and areas once monitored in isolation by separate teams now become unified streams of data that can be monitored, controlled, and analyzed.

Maximizing efficiencies – staff no longer have to be trained and deployed on multiple different port security, safety, and process systems.

At speed – the system mines for relevant data and generates alerts, with relevant workflows, so that threats that may potentially slow or disturb port operations can be avoided or dealt with more quickly.

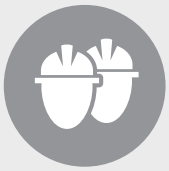
With consistency – generating automated workflows that guide operators through appropriate Standard Operating Procedures in response to events and incidents increases operational consistency, therefore improving overall site performance.

No single part of the protection pyramid needs to be neglected or reduced at the expense of another making faster, safer, more secure operations feasible.

The following examples highlight further practical applications of the approach:

STREAMLINING AND SECURING DELIVERY PROTOCOLS

Hundreds, even thousands of companies can be based in or work out of ports. For example, 90,000 people, working for around 1,200 companies, are active in the port of Rotterdam. Monitoring deliveries/access to these businesses in a busy transport environment is fraught with challenge and security risk. Integrating access control systems with ID badge databases and facial recognition software can streamline identification and approval processes, therefore removing the need for duplicated checks and multiple pinch points.



REDUCING STAFF ON HIGH-RISK TASKS

With the integration capabilities of modern surveillance systems, port management companies can reduce staff numbers required for high-risk activities. As well as reducing the risk to staff, this can be a beneficial scenario for operations in areas such as complex machinery zones or storage areas for potentially flammable or self-igniting goods such as oilseed or coal.

GUARDING AGAINST INSURANCE CLAIMS FROM FREIGHT COMPANIES

Temperature fluctuations, excessive humidity, and light levels can all have a detrimental effect on goods being stored/transferred on a port estate. Linking sensory data programmed to detect such changes with real-time video footage, personnel can immediately see any factors that may need addressing to avoid claims of negligence. These could include temperature increases, fire, water ingress, too many personnel in one area, or doorways/hatches that may be open when they should be closed.

PORT-TO-VESSEL COMMUNICATIONS

One of the biggest benefits to ports will come by expanding integration to incorporate vessel systems. Here is a realistic scenario: a certain set of criteria is detected onshore that indicates a potential breach - perhaps anomalous access control data coinciding with an unscheduled delivery. Alerts are issued to on-site teams and to the crew of vessels in a specified radius of the terminal, triggering workflows requesting a change to docking procedure or route.

Future Ports: An Expanded Role

The 'port-to-vessel' scenario referenced above signals a logical next step in port protection.

By intelligently integrating the vast array of systems installed on a port estate into one command and control platform – and incorporating workflows that facilitate wider interaction, and communication with external shipping, transport, and national security systems – ports can enhance their role as:

Critical infrastructure protectors – Through integration with police, international port authorities, vessel security systems, and consignment tracking solutions, ports can become a vital first and last line of defence against smuggling, terrorism, or large-scale incidents.

Supply chain linchpins – Supply chain standards, processes, and security measures vary from country to country. Given that consignments can travel multiple continents on a single trip, this can prove problematic for true door-to-door awareness. By harnessing data through system integration, and exploring wider integration with ship systems and RFID data etc., ports could be key to gaining that holistic view of the entire supply chain.

Transport managers – Integrating ship-to-shore systems allows ships to 'talk' to ports as they enter their docking pattern. The data collected is used to plan shore-side teams and the cargo's journey through and beyond the port estate. Further integration with systems at a regional level, along with the data generated regarding which cargo is to be stored or transported, can be used for live traffic management – keeping roads and rail open, or diverting traffic to reduce congestion.

For more information about Synectics technology solutions, visit our website: synecticsglobal.com.






Synectics designs integrated end-to-end surveillance control systems for the world's most demanding security environments. We excel at complex projects that require innovative, tailored solutions with high reliability and flexibility, specifically for casinos, oil and gas, marine, public space, banking, transport and critical infrastructure applications.

With over 30 years of high security systems experience, field proven products, and expert support personnel in the UK, US, Europe, UAE and Asia Pacific, Synectics offers its clients turnkey networked solutions for comprehensive protection and peace of mind.

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