

Cybersecurity in the Maritime Domain

Shipping Company Perspective to Marine Board Spring Meeting



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Chevron Corporation



- Origins in 1879 oil discovery at Pico Canyon, north of Los Angeles.
- Second-largest integrated energy company headquartered in the US, with extensive operations in over 30 countries.
- Approximately 61,000 employees and 200,000 contractors supporting daily operations.
- Average net production in 2014 was 2.57 million oil-equivalent barrels per day, with about 74% outside the US.
- Refineries processed 1.7 million barrels of oil per day, and we averaged 2.7 million barrels per day of refined products sales through our marketing network and retail outlets on five continents.



Photo: Installation of the drilling rig on the Big Foot platform was completed in May 2014.



Photo: Aerial view of the Captain platforms in the North Sea.



Photo: Oronite complete expansion projects at its world-scale additives plant in Singapore in 2014.



Photo: Aerial view of NWS Venture onshore facilities.

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Manage Marine Risks Across Diverse Operations



- Tankers/Barges
- LNG Carriers
- Offshore Support Vessels
- Heavy Transport
- Mobile Offshore Drilling Units
- Offshore & Fixed Marine Terminals
- FPSOs
- 4 Major offices
- Transport ~1 Billion barrels annually
- Operate 30 vessels
- Utilize more than 100 vessels daily



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Vessel Operator and Charterer



- Operate 30 vessels
 - 9 VLCC (~2 million bbl capacity)
 - 3 Suezmax (~1 million bbl)
 - 5 Aframax (~ 600,000 bbl)
 - 4 MR / US Flag (~350,000 bbl)
 - 2 Shuttle tankers (Dynamic Position)
 - 7 LNG carriers
- Utilized 825+ vessels in 2014
 - more than 300 owners and 200 operators
- Over 2,000 voyages contacting 300+ ports in 50 countries
 - Over 950 voyages did not enter US
- In 2014 did not have a recordable personal injury in our operated fleet
- Have not had a cargo or bunker spill to environment from operated fleet in >11 years
- Transmit ~2 GB of information daily between our operated vessels and shore
 - Commercial, Operations and Personnel data
 - Cargo / Port data
 - Equipment performance data
 - Personal Communications

Operational Excellence Management System



Chevron Corporate OE Expectations are organized under 13 Elements

Element 1: Security of Personnel and Assets

- Provide a physical and cyber security environment in which business operations may be successfully conducted.
 - 1.1** A process is in place to actively engage the workforce in security awareness and vigilance to the security environment.
 - 1.2** Risk-based security management plans are developed, implemented and maintained to address potential security threats to the business.
 - 1.3** A process is in place to integrate security management plans with related plans for emergency management, business continuity and information protection.

2015 Cyber Threat Landscape for the Oil and Gas Industry



Increase in Targeting of Oil and Gas Companies

- Contributing factors:
 - Dropping oil prices
 - Economic instability
 - Regional conflict
 - Automation of work processes
 - Security gaps
 - Delays in patching
 - Use of external storage and hosting solutions
 - Cloud services
 - Competitors' desire to replicate proprietary technology and processes
 - For competitive advantage
 - To decrease dependence on external partners



2015 Cyber Threat Landscape for the Oil and Gas Industry



Threats to ICS Environments

- Threat actor types
 - Cybercriminals
 - Hacktivists
 - Nation-states
- Factors
 - Physical impacts via cyberspace
 - Widening security gap
 - Low cost
- Targets
 - HMI (Human Machine Interface)
 - ICS (Industrial Control System)
 - SCADA (Supervisory Control and Data Acquisition)
 - Operations

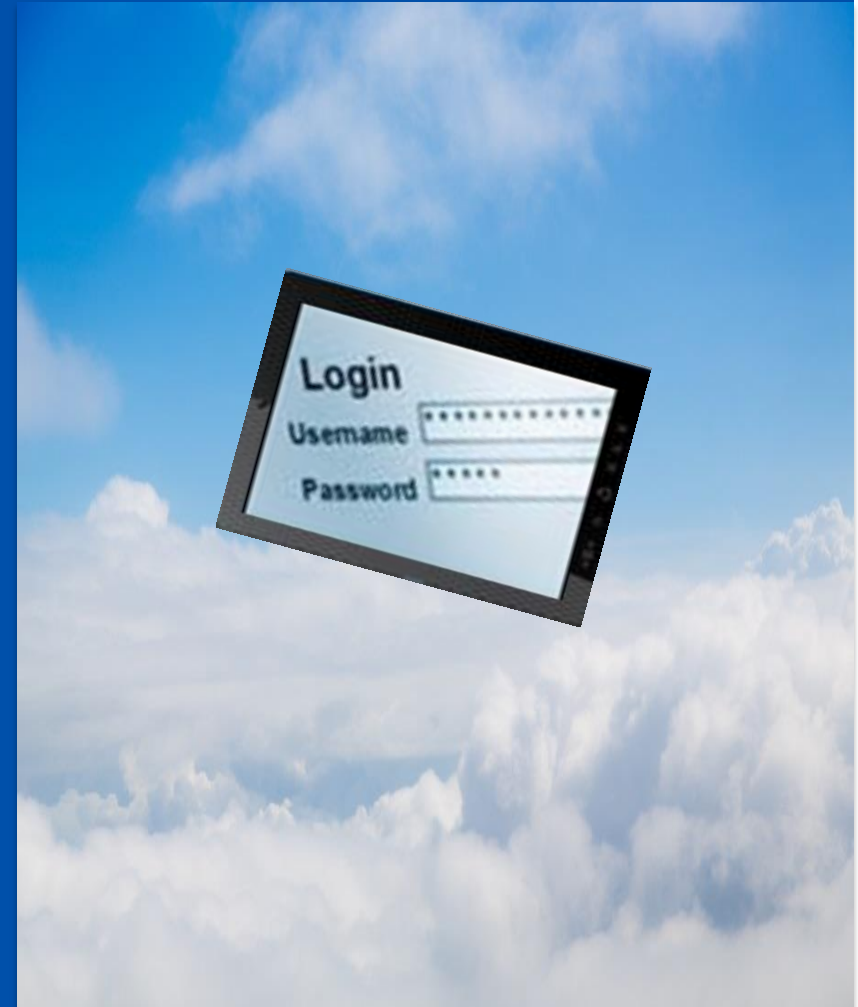


2015 Cyber Threat Landscape for the Oil and Gas Industry



Targeting Cloud Services

- Threat actor types
 - Cybercriminals
 - Hacktivists
 - Nation-states
- Factors
 - Third party
 - Potential for high yield
 - No need to compromise company
- Targets
 - Intellectual property
 - Sensitive business data
 - Employee data

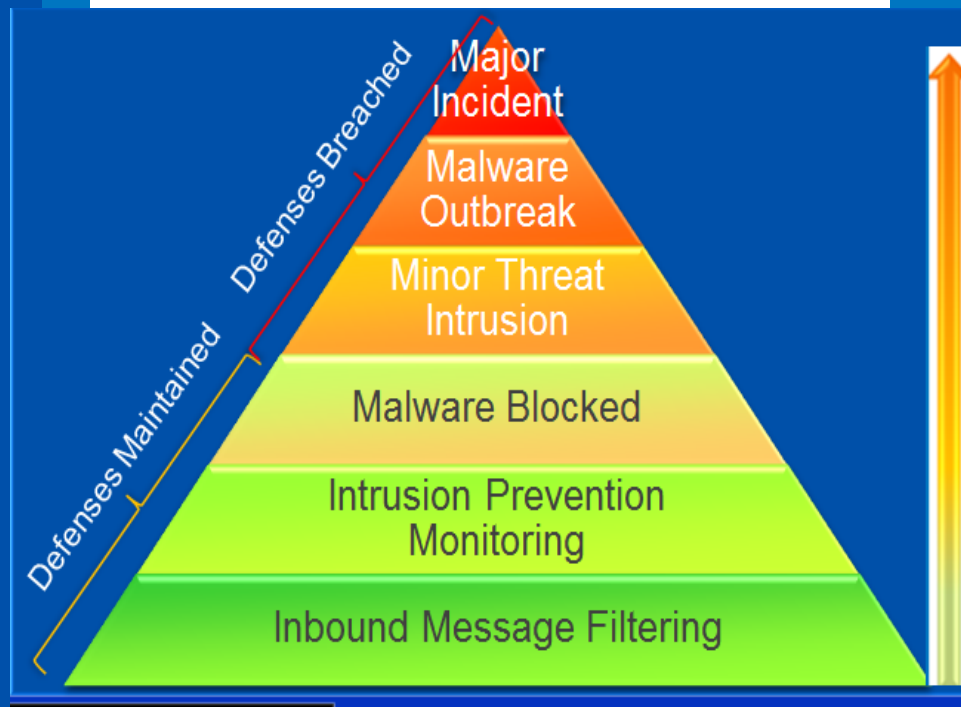


Chevron Cybersecurity Overview



- Global standards, architecture and infrastructure evolving for over 15 years
- All equipment and software is tested for security and compatibility prior to deployment
- Individual access to network, applications and sites is limited to need basis and periodically verified
- Periodic training for all users on risks and mitigations

Cybersecurity Pyramid



Shipboard Operating Environment

Complex, multi-layered, evolving



Regulatory Requirements: Flag state, Port state, IMO, Classification Society, Company domicile, etc.

Corporate Policy/Standards: Legal, Finance, OE/HES, IT, HR, etc.

Business Unit Policy/Standards: SMS

Industry Guidelines: OCIMF, SIGTTO, BIMCO, Intertanko, API, etc.

Vessel Specific: Shipyard, Designer, Owner, OEM's

Contractual Agreements – Charter Party, Procurement

Risk Management and Process Safety

Chevron Shipping Company LLC is committed to protecting people and the environment. We accomplish this by adhering to our Tenets of Operation, setting Operational Excellence objectives, monitoring performance, and maintaining secure facilities. We conduct our business in a socially responsible and ethical way. Our goal is to be the industry leader in safety and health performance and to be recognized worldwide for environmental excellence.



Key Message

Global Business



- Vessels move through multi-jurisdictional requirements with a multi-national workforce
- Shipping is segmented and fragmented by regions and vessel types, with large and small entities facing different operational risk profiles
- Multiple risks and threats to ship and shore facilities
- Technology provides benefits



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Cybersecurity - Questions

