TAKE OVER OF VESSEL DHT APPALOOSA

DHT APPALOOSA, IMO No. 9826122, DWT 319191 MT, is a Hong Kong registered vessel built and delivered by Hyundai Heavy Industries, Ulsan. This VLCC owned by DHT Appaloosa, Inc. Hong Kong, was taken over on 1st Aug 2023 in the port of Yantai, China.

NEWSLETTER CONTENTS

SEPTEMBER 2023 EDITION

MARITIME DIGITALIZATION

Source:https://www.rivieramm.com/news-content-hub/news-content-hub/key-technology-trends-transforming-shipping-in-2023-74237

Transition of the maritime industry towards digitization is inevitable. The term “digitalization” basically refers to the *incorporation of digital technologies into established business procedures, which can boost productivity and efficiency.* Although the maritime sector has historically relied heavily on paper, this rising trend has allowed it to make various operational improvements. Digital solutions can help ship Owners and Operators improve vessel performance.

The COVID-19 pandemic, as we know, has brought in a major disruption to economic activities across the world, precipitating to an unprecedented global economic crisis. One of the key lessons learned early in the pandemic was the need to ensure business continuity of the critical supply lines, notably the maritime gateways, and the associated logistical chains.

The digital revolution has emerged in the past decade as one of the main drivers of change in the port and maritime sector. By promoting a high level of integration between devices, agents, and activities, and together with the increased connectivity between ports, this digital revolution has created a new ecosystem in the industry— one where being on the outside is a significant disadvantage for the stakeholders. Because maritime transport carries 90 percent of the global merchandise trade, impediments to ports' logistical chains will have tangible repercussions for their hinterlands and populations.

Key Benefits of Digitalization in Maritime Industry

Issues like operational inefficiency, rising costs, and escalating competition have always been the challenge while attempting to meet strict regulatory requirements including ensuring safety of crew and vessels. Data streams from sensors and other sources of information can be used for decision making and enhanced monitoring, control, quality assurance and verification. Here's how digitization aids in increase of productivity and efficiency in the maritime sector:

Electronic documentation: With e-documentation, digital alternatives have replaced paper-based processes. This has resulted in reduced paperwork, speed up processing, and improved accuracy. For instance, many forms and working SMS are online and in electronic forms. Various documents can be navigated and retrieved by a click of a button and search functions. Forms can be shared, amended, electronically signed faster than before.

Real-time tracking: The maritime industry can now track ships and cargo in real-time, which improves planning and coordination of operations, and increases efficiency and productivity. For instance, the Automatic Identification System (AIS) is used to track ships in real time, which helps with route planning and lessens port congestion.

Electronic Navigation Systems: Electronic navigation systems such as GPS and ECDIS (Electronic Chart Display and Information System) have greatly improved safety by providing accurate real-time vessel positioning and up-to-date nautical charts, which can help prevent collisions and groundings. This can now be enhanced with AI for pre alerts and assisting the navigators in making quick assisted decisions.

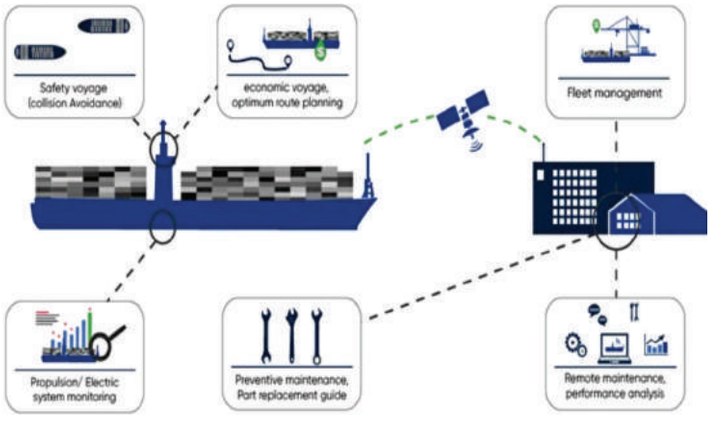
Predictive maintenance: Because of digitalization, ships, and equipment can now be monitored in real time, allowing predictive maintenance. This enables maintenance to be planned in advance of a breakdown, minimizing downtime and boosting productivity. For instance, sensors can be used to keep tabs on the health of engines, enabling the early identification of potential issues.

Internet of Things (IoT): This stage involves the use of interconnected devices to collect, analyze, and share data in real time. In maritime transport, IoT can be used to monitor cargo, vessels, and other assets in real-time, and to provide insights that can improve decision-making.

Blockchain: The use of blockchain technology helps create a secure, decentralized, and transparent system for managing transactions and information exchange in maritime transport. Crucial to maritime digitalization, blockchain can be used to manage contracts, bills of lading, and other important documents securely and efficiently.

Automation of processes: Another key benefit of digitalization in the maritime industry is process automation. It leads to increased productivity and efficiency by automating tasks like container handling, cargo tracking, and vessel management. Automated container terminals, for instance, can handle cargo more effectively and speed up turnaround.

Data analysis: One of the primary applications of data analysis tools is vessel routing optimization. Marine operators can reduce fuel consumption and improve efficiency by collecting and analysing data on vessel movement patterns, fuel consumption, and other relevant metrics.



Source: Marin Digital

Improved Maintenance Advantages:

It has been proved that cost improvements of 15 to 20 percent can be achieved by using predictive maintenance analysis to shift the balance from reliance on routine scheduled activities to greater increased preventative maintenance. For instance, predictive maintenance using continuous digital monitoring can increase both the reliability and lifespan of assets. Sensors can be used to keep tabs on the health of engines, enabling the early identification of potential issues.

Further improvements can be achieved by optimizing time spent in dry docks, better integration with equipment and maintenance standards, and closer coordination with strategic suppliers.

Cybersecurity: As vessels and shoreside operations become more connected, cybersecurity is becoming an increasingly important concern. Digitalization has enabled the development of cybersecurity solutions, such as firewalls, intrusion detection systems, and data encryption, which help protect against cyber threats.

Major Environmental Benefits:

It is estimated that more than 90% of world trade is transported via ships and the shipping sector which plays a significant role in climate change programmes. There is hence an increased need to reduce carbon footprints by adopting sustainable practices. Technology and tools where advanced analytics which consider variables like real time info on wind, currents, weather, and other environmental conditions can help optimize routes leading in decrease of fuel consumption and help lower carbon emissions.

Conclusion:

The potential of digital technologies into Maritime transportation will be hard to ignore. The transition towards digitalization and automation is speeding up in the maritime industry; these technologies are also being implemented to spur the industry along the decarbonization path to realize zero emissions from international shipping by mid-century.

Digitalization can help mitigate the impact of volatility, ensuring more timely and accurate communication between the industry stakeholders, and in turn, a better understanding of how to manage and use available assets. It is not about tapping experimental technologies but rather leveraging well-proven technologies where various maritime organizations have already invested in. To secure efficient, sustainable operations and strengthen short- and long-term competitiveness, maritime stakeholders need to re-think their current strategies and adapt… and it all starts with AWARENESS to available technologies and the WILL to CHANGE.

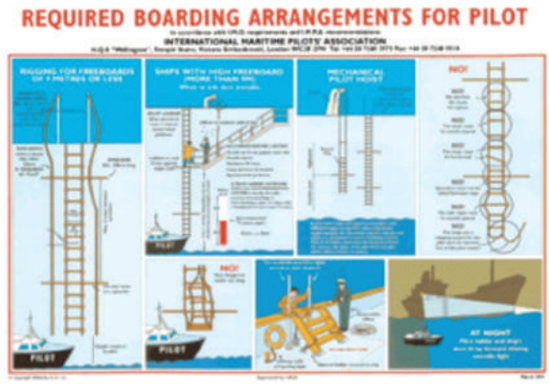
References:

1. pubdocs.worldbank.org/en/Accelerating-Digitalization-Across-the-Maritime-Supply-Chain
2. Dockmaster.com
3. DNV: Digitalization of Maritime Industry
4. Oliver Wyman

Contributed by Mr. Bhaskar Guntamukkala

PILOT LADDER SAFETY

Pilot ladder rigging is a crucial aspect of maritime operations, especially during the transfer of pilots between vessels. However, mistakes in pilot ladder rigging can lead to serious accidents and jeopardize the safety of crew members, pilots, and vessels. Shipowners, operators, masters and crews are reminded that pilot transfer arrangements, including pilot ladders, must comply with the obligations under the International Convention for the Safety of Life at Sea (SOLAS) Chapter V Regulation 23.



Source: https://kompasmu.github.io/pigura/post/impa-pilot-poster/

Here are some common causes and mistakes in pilot ladder rigging that maritime professionals need to be vigilant about:

1. Inadequate Inspection and Maintenance:
   - Failure to regularly inspect pilot ladders for wear, tear, and damage.
   - Ignoring signs of degradation, such as fraying ropes or damaged spreaders.
   - Not following SOLAS regulations for ladder inspection and replacement.
2. Improper Angle and Length:
   - Rigging the ladder at an incorrect angle, making it unsafe for climbing.
   - Using a ladder that doesn't meet SOLAS recommended length for safe boarding.
3. Incorrect Rigging Equipment:
   - Using non-compliant hooks, ropes, or spreaders for ladder rigging.
   - Failing to secure hooks properly to the ship's side, leading to ladder instability.
4. Insufficient Lighting and Visibility:
   - Neglecting to provide proper lighting for ladder use during night time or low-visibility conditions.
   - Failing to mark the ladder's position with reflective tape or other visibility aids.
5. Lack of Crew Training:
   - Not providing adequate training to crew members responsible for ladder rigging.
   - Crew members not knowing how to securely rig the ladder or perform emergency procedures.
6. Inadequate Communication:
   - Lack of clear communication between pilots, ship crew, and pilot boat crew during ladder operations.
   - Misunderstandings leading to unsafe ladder positioning or movement.
7. Ignoring Weather Conditions:
   - Using pilot ladders in adverse weather conditions, rough seas, or strong currents.
   - Not assessing sea conditions and making decisions based on safety.
8. Improper Storage and Handling:
   - Storing pilot ladders in areas prone to damage or degradation.
   - Mishandling the ladder during deployment and retrieval.
9. Neglecting Emergency Procedures:
   - Not having a clear emergency plan for ladder failure, person overboard, or other accidents.
   - Crew members not trained in emergency response and rescue techniques.
10. Ignoring SOLAS Regulations:
    - Not adhering to SOLAS guidelines and regulations for pilot ladder rigging and usage.
    - Disregarding recommended best practices for pilot ladder safety.
11. Underestimating the Importance of Pilots' Input:
    - Not involving pilots in the discussion of ladder positioning and safety measures.
    - Overlooking pilots' expertise and insights in safe ladder rigging.

To ensure safe pilot ladder rigging practices, maritime professionals must prioritize regular training, adherence to regulations, clear communication, and continuous monitoring of ladder condition. By addressing these common mistakes and promoting a safety-first culture, the risk of accidents during pilot transfer operations can be significantly reduced, enhancing the overall safety of maritime operations.

MENTAL HEALTH

Source: https://neurosciencenews.com

What is Mental Health?

Mental health refers to a person's emotional, psychological, and social well-being. It encompasses our thoughts, feelings, behaviors, and how we cope with the ups and downs of life. Good mental health isn't just the absence of mental illness; it's about having the ability to manage stress, maintain fulfilling relationships, work productively, and make sound decisions.

Why is Mental Health Important for Overall Health?

Mental health is inseparable from overall health. It impacts how we think, feel, and act, influencing how we handle stress, relate to others, and make choices. Good mental health is crucial for:

Physical Health: Mental health affects physical well-being through its influence on behaviours like diet, exercise, and sleep.

Relationships: Positive mental health enables healthy relationships, effective communication, and empathy.

Productivity: A sound mind enhances productivity, focus, and creativity in work and daily activities.

Quality of Life: Good mental health contributes to life satisfaction, happiness, and the ability to enjoy life's pleasures.

Coping: Mental well-being equips us with healthy coping mechanisms to navigate challenges and stressors.

Can Your Mental Health Change Over Time?

Yes, mental health can change over time. Just like physical health, mental health can fluctuate based on life circumstances, experiences, and age. Factors such as stress, trauma, major life changes, biological changes, and access to support systems can impact mental health positively or negatively.

How Common Are Mental Illnesses?

Mental illnesses are common. According to the World Health Organization (WHO), 1 in 4 people globally will experience a mental health issue at some point in their lives. Conditions like depression, anxiety, bipolar disorder, and schizophrenia affect millions of individuals, cutting across age, gender, and cultural lines.

What Causes Mental Illness?

Mental illnesses arise from a complex interplay of genetic, biological, psychological, and environmental factors:

Genetics: Family history of mental illness can increase the risk of developing similar conditions.

Biological Factors: Neurotransmitter imbalances, brain structure, and hormonal changes can contribute to mental health issues.

Trauma and Life Experiences: Childhood trauma, abuse, neglect, and other life events can trigger or exacerbate mental health challenges.

Environmental Factors: Socioeconomic status, living conditions, access to education, and exposure to stressors can impact mental health.

Psychological Factors: Personality traits, coping mechanisms, and cognitive patterns influence mental well-being.

Substance Abuse: Drug and alcohol misuse can exacerbate or cause mental health disorders.

Neurodevelopmental Factors: Early brain development and disruptions during critical periods can lead to mental health issues.

Social Support: Lack of strong social connections can contribute to feelings of isolation and exacerbate mental health challenges.

Cultural and Societal Factors: Societal stigma, discrimination, and cultural norms can impact how mental health is perceived and addressed.

Understanding these factors helps reduce stigma, promote early intervention, and develop comprehensive approaches to mental health care and support.

Mental health is a vital aspect of overall well-being, influencing how we think, feel, and interact with the world. It's susceptible to change, and mental illnesses are common and diverse. The causes are multifaceted, underscoring the importance of holistic approaches to promoting mental well-being and addressing mental health challenges.

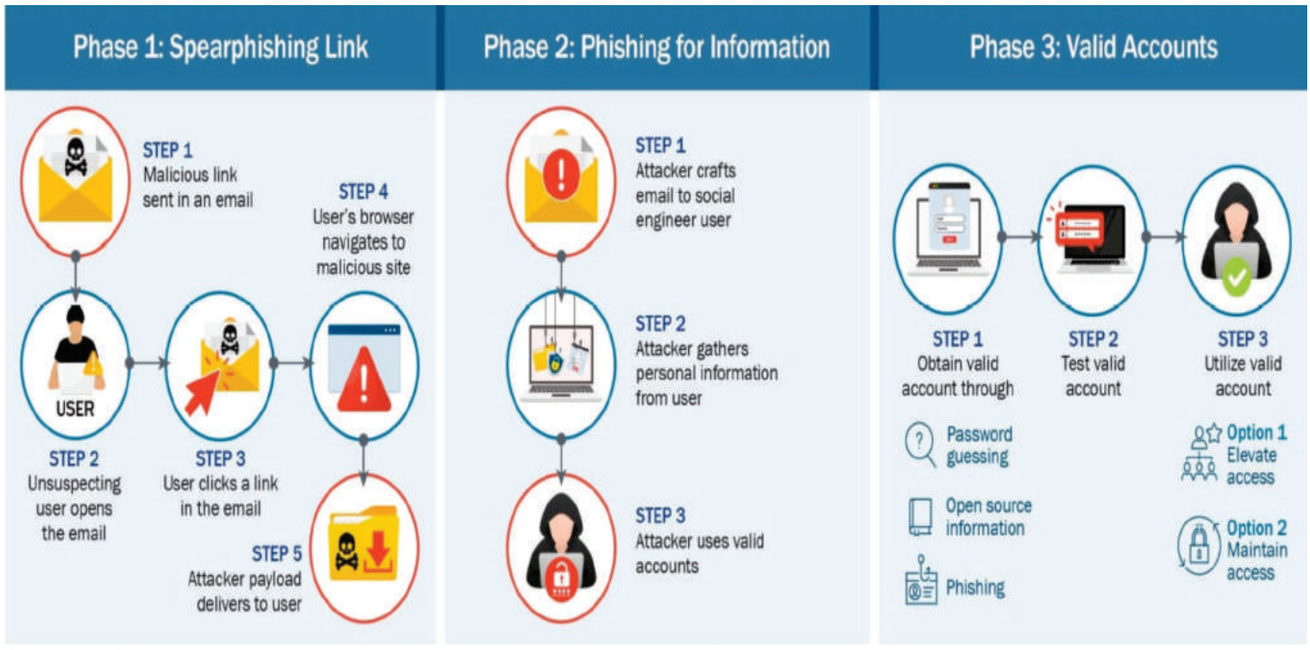
CYBER ATTACKS ON SHIPS

Cyberattacks on ships, also known as maritime cyberattacks, have become a growing concern as ships and maritime infrastructure increasingly rely on digital technologies and connectivity. These attacks can have serious consequences, including compromising the safety, navigation, and operations of vessels. Here are some common types of cyberattacks on ships:

- **Malware and Ransomware:** Malicious software (malware) and ransomware can infect shipboard computer systems and disrupt operations. Ransomware can encrypt critical data and demand a ransom for decryption.
- **Phishing:** Phishing attacks involve sending deceptive emails or messages to ship crew or staff with the goal of tricking them into revealing sensitive information, such as login credentials, or clicking on malicious links or attachments.
- **Data Theft:** Cybercriminals may attempt to steal sensitive data from ship systems, including cargo manifests, crew information, or financial records.
- **Remote Access:** Unauthorized individuals gaining remote access to ship systems can manipulate navigation, steering, and propulsion systems, potentially endangering the ship and its crew.
- **GPS Spoofing:** Attackers can manipulate Global Positioning System (GPS) signals to mislead ship navigation systems, causing vessels to deviate from their intended routes or enter restricted areas.
- **Denial-of-Service (DoS) Attacks:** These attacks aim to overwhelm a ship's communication or navigation systems with excessive traffic, rendering them unusable.
- **Unauthorized Access:** Weak passwords or vulnerabilities in onboard systems can provide attackers with unauthorized access to ship networks, allowing them to compromise systems.
- **Supply Chain Attacks:** Malicious actors may target shipboard systems through compromised software or hardware components that are part of the ship's supply chain.

The consequences of these cyberattacks can range from financial losses to severe safety risks for the crew and the environment.

Example Assess Mission Storyboard



Source: safety4sea

To mitigate these threats, Goodwood has robust cybersecurity measures in place. These include the implementation of ISMS Policy, conducting routine cybersecurity training for crew members and keeping software and systems up to date with security patches. Additionally, Goodwood has obtained ISO/IEC 27001:2013 certification, assessed by ABS which encompasses office-based information security support and maintenance for ship management services in line with SOA GSM – SOA – 10.10.10. REV 1.0.

Contributed by Mr. Balamurugan B.

SAMPLING AND MONITORING FOR THE 2013 VESSEL GENERAL PERMIT (VGP)

The VGP is an expansive permit in compliance with the Clean Water Act (CWA) that authorizes twenty-seven (27) different vessel effluent discharges in accordance with this permit. The permit became effective on December 19, 2013, and continues to remain effective past its 5-year validity pending the full implementation of regulations required by the Vessel Incidental Discharge Act (VIDA).

Due to several reasons at this time, the full implementation of VIDA cannot be predicted. One of the significant complexities of the permit (VGP) is the analytical monitoring and sampling (M&S) requirements for these four effluents (No other VGP regulated effluents require M&S):

- Bilge Water
- Graywater
- Ballast Water
- Exhaust Gas Scrubber Washwater.

See table below for specific discharge requirements.

a. Bilgewater discharges must be monitored for any vessel constructed on or after December 19, 2013 and greater than 400 gross tons that discharge bilgewater to waters of the United States (see Part 2.2.2.1 of the VGP).

b. Graywater discharge must be monitored for any vessel discharging graywater to waters of the United States constructed on or after December 19, 2013, having a maximum crew capacity of at least 15 crew, and providing overnight accommodation to those crew, and vessels that are not “commercial vessels” discharging graywater operating on the Great Lakes (see Part 2.2.15.2 of the VGP).

c. Ballast water discharges must be monitored on vessels using a ballast water treatment system to achieve the numeric discharge limitations at Part 2.2.3.5 of the 2013 VGP that discharge ballast water to waters of the United States (see Part 2.2.3.5.1.1 of the VGP).

d. Exhaust gas scrubber discharges must be monitored on any vessels discharging exhaust gas scrubber washwater to waters of the United States (see Part 2.2.26.2 of the VGP).

Discharge	Section of VGP	Applicable Vessels	Frequency	Analytes
Bilgewater	2.2.2.1	New Build > 400 gross tons that discharge bilgewater into U.S. waters	1 per yr. (waiver qualifications after 2 yr.)	Oil in water Oil Content Meter reading
Ballast Water	2.2.3.5.1.1	All Vessels using a ballast water treatment system once they use that system	1 per mo.	Equipment performance
			1 to 4 per yr., dependent on type of system, see 2.2.3.5.1.1.4	Biological indicators
		BWTS that use active substances/ Biocides	3 to 5 times during first 10 discharges, 2 to 4 times per yr. dependent on type of system, see 2.2.3.5.1.1.5.2	Biocides and residuals of treatment
Graywater	2.2.15.2	New Build vessels with crew capacity ≥ 15 and overnight accommodations; or vessels operating on the Great Lakes that are not "commercial vessels" within the meaning of Clean water Act section 312. Only applicable if discharging graywater into U.S. waters	2 per yr.	Biocides and residuals of treatment
Exhaust Gas Scrubber Washwater Discharge	2.2.26.2	All vessels with wet exhaust gas scrubber systems which discharge into U.S. waters	2 for first yr., 1 per yr. thereafter	Dissolved and total metals, PAH, nitrates-nitrite, pH

Source: https://www.epa.gov/vessels-marinas-and-ports/commercial-vessel-discharge-standards-frequently-asked-questions#Sampling

SHORE LEAVE – A DISTANT DREAM

With shipping getting busier and hectic with every passing day; the shore leave which is known to improve the well-being of seafarers is becoming like a distant dream for many seafarers. Here are some reasons why shore leave is essential for seafarers:

Mental and Emotional Well-being: Shore leave provides seafarers with a much-needed break from the ship's routine, allowing them to relax, de-stress, and recharge their mental and emotional batteries.

Social Connection: Shore leave provides an opportunity to connect with loved ones, fellow crew members, and locals at the ports, fostering a sense of belonging and camaraderie.

Cultural Experience: Shore leave can be an enriching experience as they get to interact with people from different backgrounds, try local cuisines, and engage in various recreational activities.

Health and Well-being: Physical health is paramount for seafarers, and shore leave allows them to access medical facilities, receive medical check-ups, and purchase supplies or medication if needed. Additionally, it enables them to engage in physical activities and exercise, promoting overall well-being.

Rest and Relaxation: Shore leave offers a break from these strenuous routines, allowing them to rest and recuperate before returning to their duties on board.

Career Satisfaction: Shore leave contributes to job satisfaction among seafarers. Knowing they have the opportunity to enjoy time ashore makes the challenges of life at sea more manageable, leading to a more content and motivated workforce.

Improved Performance: Regular shore leave can lead to improved performance on board the ship. Seafarers who are well-rested, mentally refreshed, and emotionally stable are more likely to carry out their responsibilities effectively and maintain a safe working environment.

Mitigating Fatigue and Stress: Shore leave helps mitigate the effects of fatigue and stress, which can compromise safety at sea. Well-rested and stress-free seafarers are better equipped to respond to emergencies and make sound decisions.

Recruitment and Retention: The availability of shore leave can impact the recruitment and retention of seafarers. Companies that prioritize seafarers' well-being by providing regular shore leave are more likely to attract and retain skilled crew members.

In summary, shore leave is not just a recreational break for seafarers; it is a fundamental aspect of their well-being, job satisfaction, and overall quality of life. Arranging a shore leave can be a task for some masters at some ports. Hence, it is very important that the masters should make extra efforts to arrange for shore leave for their crew in a port where shore leave is allowed and the port is considered safe for sending crew ashore.

Some masters might step back from taking this task of arranging shore leave as they might find the whole process too overwhelming and useless. Sometimes; the shore leave requires boat charges to be paid which requires talking to their superintendent to approve the boat charges. I have seen that many masters have developed a preconceived notion that the superintendent will never approve boat charges. Since the Covid restrictions are relaxed; I have managed to liaise with the agents and our technical superintendent to arrange for the shore leave. I sensed no restriction from the company's side for arranging the shore leave. The ones sitting in the office were once sailors and they too understand the importance of shore leave.

Proper manning and full regard for the Drug & Alcohol policy as per Goodwood's HSQEEn is a must when sending crew for shore leave.

Shore leave is a great privilege and hence it should never be misused but cherished to make good memories.

Contributed by Captain Manjindar Singh Khosa

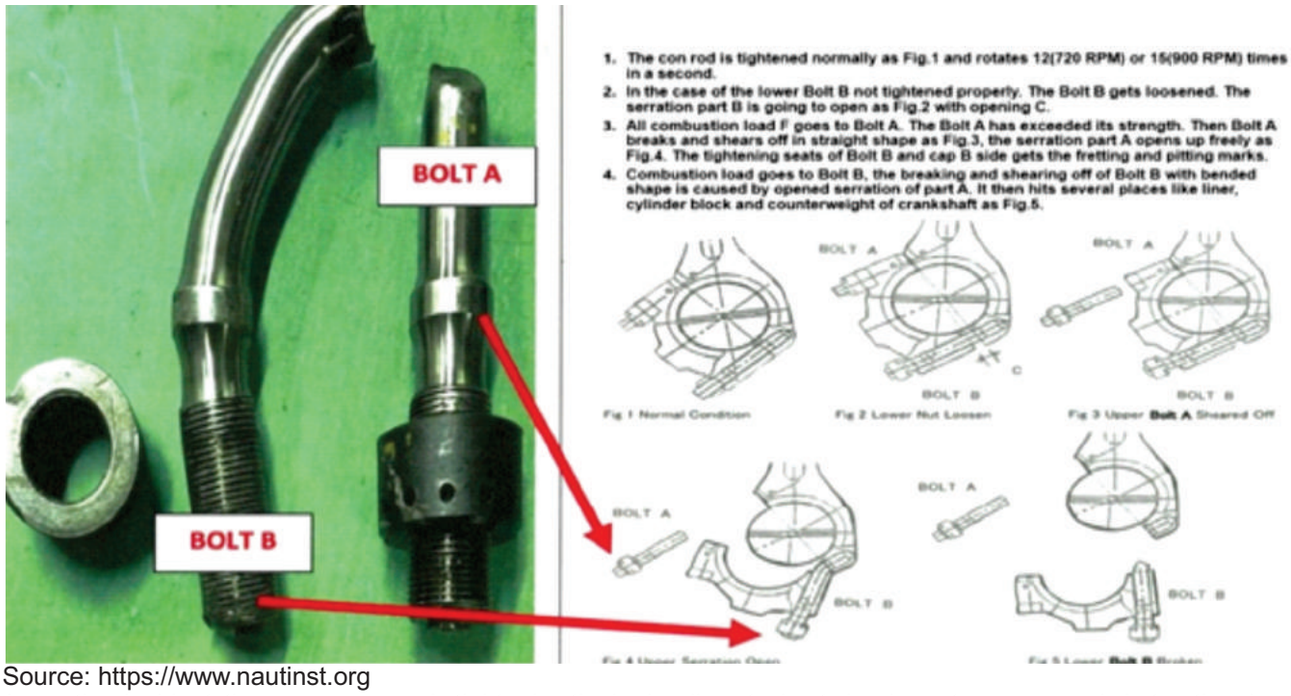
AUXILIARY ENGINE CONNECTING ROD BOLTS / NUTS TIGHTENING

Despite being highlighted through various company/ makers circulars and publications it has been observed that the incidents relating to improper tightening of connecting rod bolts are still prevalent in the marine industry. One such incident is depicted as follows:

The engine crew started auxiliary engine No.1 for a routine operational test while at anchor. After about two minutes of warm up the engine was connected to the electrical board. A few minutes later, there was a loud noise followed by strong vibrations. Numerous alarms were activated, and the engineers immediately disconnected and stopped the affected engine.

A forensic examination of the damaged engine and reconstruction of the sequence of events suggested that one of the two studs of the connecting rod for cylinder two had not been adequately tightened during maintenance. A gap developed due to stud B being under-torqued. This overstressed stud A, which consequently sheared and caused the subsequent damage sequence.

Following this hypothesis, the hydraulic stud tensioning pump used for tightening the con rod mechanism was thoroughly examined. The pressure gauge on this pump read 60 bar higher than actual supplied pressure. This could well have led to less than adequate tensioning of the connecting rod nuts during maintenance and could be the cause of premature failure.



Source: https://www.nautinst.org

In another incident, there was an error in tightening the hydraulic nuts due to inadequate access and obstruction due to location of the working platform. In such cases the platforms should be removed before carrying out tightening of the bolts.

Conclusion:

1) The connecting rod bolt tightness should always be supervised by a senior engineer and makers instructions for bolt tightening should be closely followed.

2) The hydraulic pump and its gauge or the torque spanner should be in good working condition and should be calibrated annually.

(I) The hydraulic pump & pressure gauges are to be calibrated before each use.

(ii) While using torque wrench, ensure that its lever can be moved freely without any obstruction from nearby floor plate.

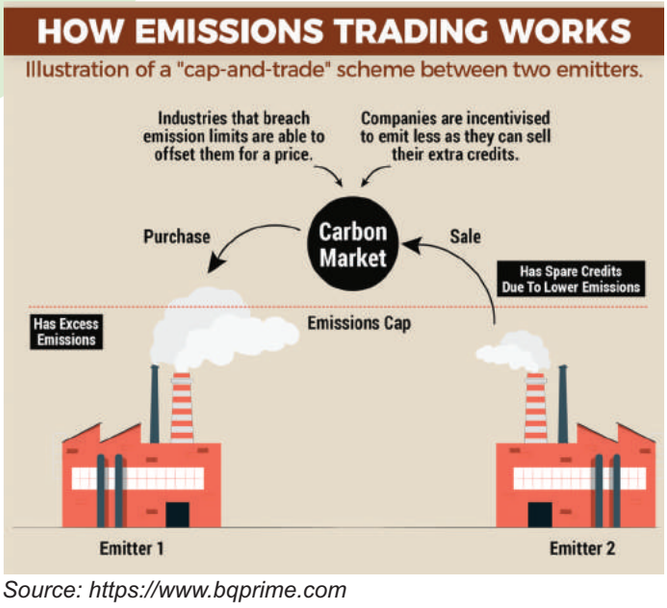
3) The bottom end bearing bolts tightness should always be re-checked post overhaul/renewal of bottom end bolts within 50~100 hours of running the engine based on maker's instructions.

EU EMISSION TRADING SYSTEM:

Source: https://climate.ec.europa.eu

Under the EU ETS each company with ships trading in the EU/EEA is required to surrender emission allowances corresponding to a certain amount of its GHG emissions emitted over a calendar year starting with 2024. The requirements apply to the shipping company which is the shipowner or any other organization or person, such as the manager or the bareboat charterer, who has assumed the responsibility for the operation of the ship including duties and responsibilities imposed by the ISM Code. The emissions will be reported and verified through the existing EU MRV (Monitoring, Reporting and Verification) system, which will be revised and extended to cover necessary GHG emissions, ship types and sizes.

Emission Trading System (ETS) consists of several key components that work together to create a market-based mechanism for regulating and reducing greenhouse gas emissions. These components include:



Source: https://www.bqprime.com

Emission Allowances: These are the core units of trade within an ETS. They represent the right to emit a specific amount of greenhouse gases, usually measured in metric tons of CO2 equivalent. Allowances are distributed among participating entities, such as companies or industries, based on established emission reduction targets or historical emissions.

Cap (Emission Limit): The cap represents the overall limit on total emissions that are allowed within the ETS jurisdiction. It's a crucial element that ensures emissions stay within environmentally sustainable levels. The cap is often set by regulatory authorities and is gradually lowered over time to achieve emission reduction goals.

Allowance Allocation: The process of distributing emission allowances to participating entities. Allocation methods can vary; they might be based on historical emissions, output, or other factors. A fair and effective allocation method is important to ensure that industries are motivated to reduce emissions while avoiding negative economic impacts.

Trading Mechanism: The heart of the ETS, this is where participants can buy and sell emission allowances. Entities with surplus allowances (those emitting less than their allocated limit) can sell them to entities exceeding their limits. This creates a market price for emissions, encouraging emission reductions where they are most cost-effective.

Compliance Obligations: Participating entities are required to hold enough allowances to cover their actual emissions. If an entity emits more than its allocated allowances, it must either purchase additional allowances from the market or face penalties.

Monitoring, Reporting, and Verification (MRV): Robust MRV procedures are essential to ensure accurate and credible emissions data. Participating entities need to measure and report their emissions regularly, and independent verifiers confirm the accuracy of these reports. This transparency helps maintain the integrity of the system.

Offsets and Credits: Some ETS programs allow participants to use emission offsets or credits from approved projects outside the covered sectors to meet their compliance obligations. These projects might involve activities that reduce emissions, such as reforestation or renewable energy projects.

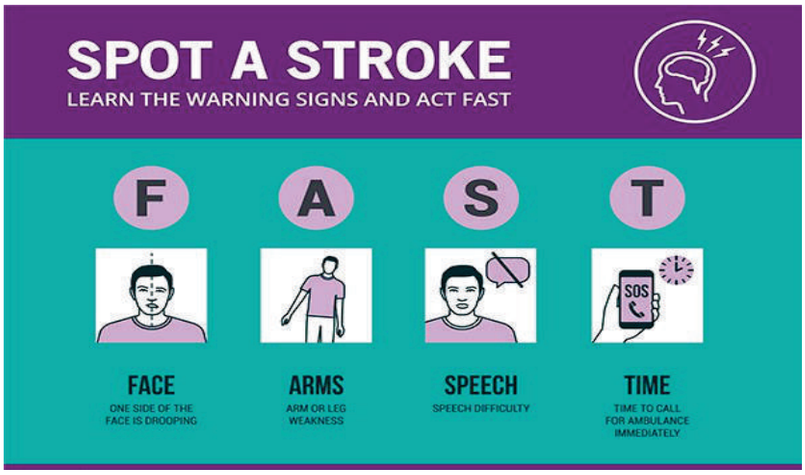
Market Stability Mechanisms: To prevent extreme price fluctuations and ensure market stability, some ETS programs incorporate mechanisms like price floors and price ceilings. These help avoid situations where allowances become too cheap or too expensive.

Banking and Borrowing: Participants can often save or "bank" allowances for future use. They can also borrow allowances from future years, under certain conditions. This flexibility allows entities to manage their emissions strategically.

Linking and International Cooperation: Some ETS programs can be linked, allowing allowances to be traded across jurisdictions. This can create a larger, more liquid market, increase cost-efficiency, and facilitate international cooperation on emission reduction.

These components together create a market-driven approach to emissions reduction, incentivizing entities to find the most cost-effective ways to reduce their emissions and contributing to overall environmental goals.

HOW TO RECOGNISE A STROKE: Think FAST



Once someone has had a stroke, the risk of suffering another stroke becomes higher. At any time, you may witness a stroke in a family member, friend, or a stranger.

Time is of the essence in treating a stroke. Learn to spot the early warning signs of stroke and know what actions to take.

If you suspect someone is having a stroke, remember the acronym **FAST:**

F: Face drooping. Ask the person to smile and check if one side of their face is drooping.

A: Arm weakness. Ask the person to raise both arms and see if one arm drifts downward.

S: Speech difficulty. Ask the person to repeat a simple sentence and check if their speech is slurred or incomprehensible.

T: Time to call emergency services. If you observe any of these signs, call for immediate medical assistance.

Acting quickly can potentially save a life and minimize the long-term effects of a stroke.

CROSSWORDS : ENVIRONMENTAL TERMS - WORD SEARCH

Find and circle the names in the grid. Look for them in all directions including horizontal, vertical and diagonal.

S	G	V	G	E	M	I	S	S	I	O	N	C	O	N	T	R	O	L	A	R	E	A	S	E
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D	R	F	A	F	O	W	S	Z	E	Q	R	S	E	E	Y	M	Y	V	E	M	O	E	U	B
Z	G	A	R	B	A	G	E	M	A	N	A	G	E	M	E	N	T	P	L	A	N	R	N	B
R	Y	V	B	F	S	J	E	Z	R	D	T	E	A	E	F	N	V	G	V	W	M	U	G	E
S	B	R	O	B	H	F	M	N	R	W	O	S	E	N	M	Z	H	Q	R	X	E	R	T	R
H	A	H	N	S	J	M	P	M	F	D	R	Z	M	T	I	P	F	O	M	U	N	G	M	E
F	S	Q	D	H	S	F	D	R	B	E	H	E	O	G	F	C	M	G	U	X	T	R	W	G
S	E	R	I	B	Q	S	T	M	I	A	D	D	Q	N	G	R	C	Q	B	S	V	Q	A	T
J	L	B	O	S	H	E	D	R	L	X	L	V	X	X	E	W	B	O	Q	M	E	U	L	W
N	I	N	X	J	E	V	X	N	G	D	M	L	C	F	F	B	S	G	M	F	V	G	K	G
S	N	E	I	Q	N	E	O	R	E	Q	H	Z	A	X	I	V	E	H	T	P	H	T	A	W
R	E	U	D	J	G	R	E	Y	W	V	T	E	R	S	L	R	M	S	G	B	O	W	L	S
J	Z	E	E	O	I	I	B	T	A	T	A	R	G	E	T	N	B	G	S	G	V	U	I	M
S	E	T	B	H	N	T	H	E	T	G	W	B	O	W	E	B	S	V	B	Q	S	V	N	W
T	J	S	T	W	E	Y	W	T	E	N	E	R	G	Y	R	E	V	I	E	W	D	N	E	D
D	S	H	Y	D	R	O	C	A	R	B	O	N	W	H	R	N	E	E	Q	E	R	D	E	N
S	J	A	N	N	U	A	L	E	F	F	I	C	I	E	N	C	Y	R	A	T	I	O	D	S

Words to search:

SEWAGE
EEDI
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