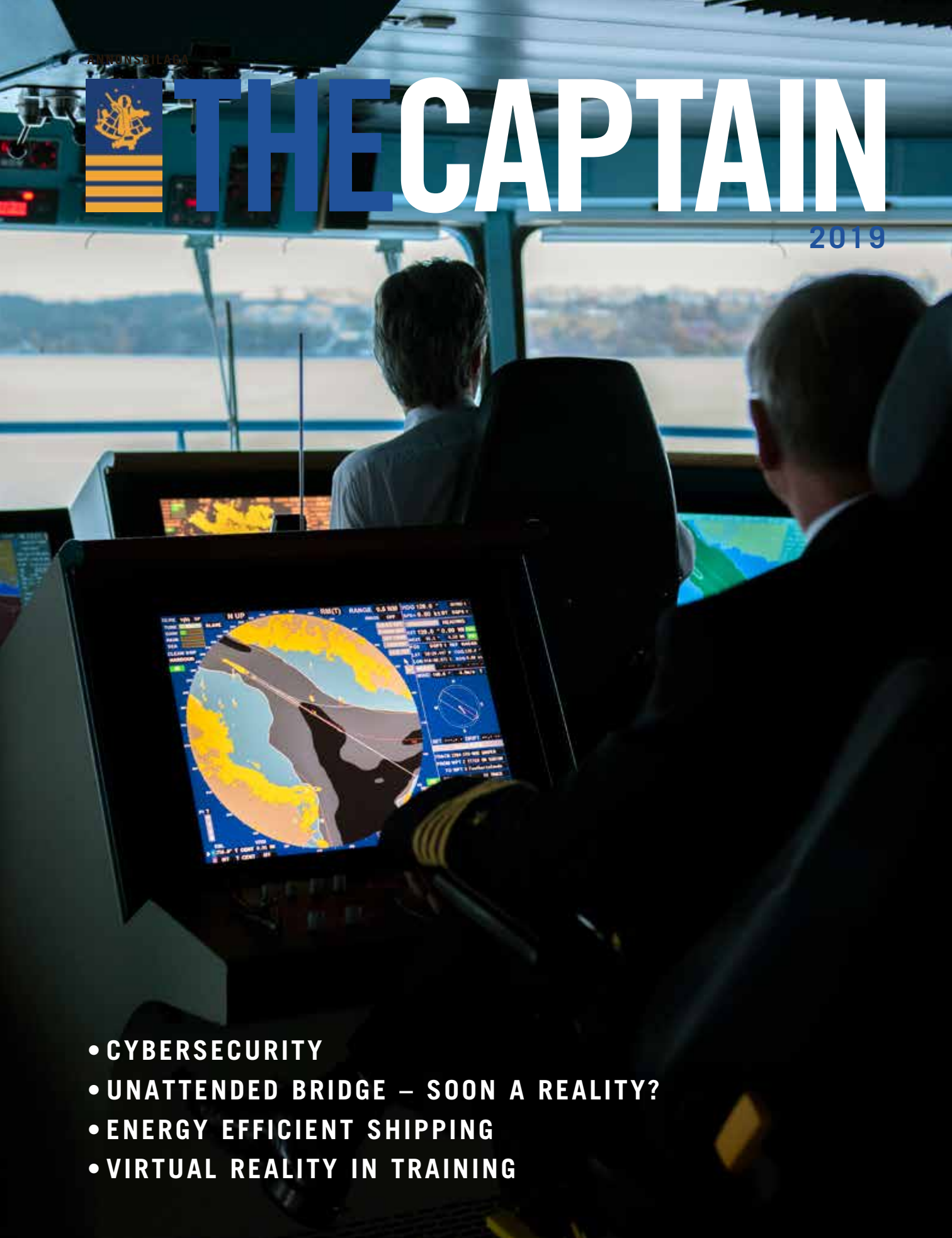


ANNONS-BILAGA



# THE CAPTAIN

2019



- **CYBERSECURITY**
- **UNATTENDED BRIDGE – SOON A REALITY?**
- **ENERGY EFFICIENT SHIPPING**
- **VIRTUAL REALITY IN TRAINING**

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## Vi utvecklar The Captain-konceptet

**DET ÄR DAGS** för The Captain 2019, medlemstidningen för Sjökaptenerna från Åbo Navigationsinstitut rf, Ånikap. Vi har just avslutat sjöfartsmässan med rekord i utställare och besökare samt njutit av skepparbalen med över 200 gäster på Åbo Slott. Det är något speciellt i att fira skepparbalen i så fin festmiljö som Åbo Slott erbjuder med gäster som har en anknytning till sjöfartsutbildningen i Åbo. Tack till festtalaren för ett fint och högaktuellt festtal.

**THE CAPTAIN KOMMER** nästa gång ut tidigare än i år och vi kommer i samarbete med Sjöfartstidningen att börja utveckla The Captain-konceptet. I framtiden blir det en större andel artiklar i tidningen med fokus på nutid och framtid men det finns givetvis fortfarande utrymme för nostalgiska artiklar. Vi kommer

bland annat att rapportera mer om sådant som är aktuellt inom sjöfartsutbildningen vid Aboa Mare.

**THE CAPTAIN ÄR** nu tillgänglig även i digitalt format. För att internationella läsare ska ha möjlighet att ta del av innehållet och vad som händer inom det finländska sjöfartsklustret ser vi redan i detta nummer flera texter på engelska än tidigare. Vi ser fram emot ett framgångsrikt år 2020!

*Micael Vuorio  
Ordförande  
Sjökaptenerna från Åbo  
Navigationsinstitut rf, Ånikap.*



**I SAMARBETE MED** Ånikap har Sjöfartstidningen producerat tidningen The Captain sedan 2002. Vi tackar som ödmjukast för förtroendet och ser nu fram emot att tillsammans göra The Captain ännu bättre och mångsidigare. Ambitionen är att göra en tidning som är relevant och intressant för en så bred målgrupp som möjligt – kort sagt alla som på ett sätt eller annat är intresserade av fartyg, ny ombordteknik, forskning och utveckling samt inte minst utbildning och kompetensutveckling.

**SAMTIDIGT ÄR DET** viktigt att förmedla den tradition som sjöbefälsutbildningen så stolt fört vidare oavbrutet sedan navigationsskolan grundades 1813. Yngre sjöfarare är intresserade av hur livet ombord tedde sig på ”den gamla goda tiden”. Berättelser och skrönor

från gångna decennier hör till livet ombord, även om den absoluta sanningshalten ibland kan ifrågasättas.

**VI VILL ÄVEN** visa att sjöyrkena är ett bra val för moderna ungdomar. Utvecklingen går hela tiden framåt, så också till sjöss. Livet ombord är inte – och ska inte heller vara – som det var förr. Dagens sjömän är precis lika bra som gårdagens, men verksamheten har förändrats. Digitaliseringen är vardag inom sjöfarten och detta återspeglas givetvis även i sjöbefälsutbildningen.

*Pär-Henrik Sjöström  
Chefredaktör, Sjöfartstidningen*



### THE CAPTAIN 2019

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# The traditional Maritime Fair from a student's perspective



**THE TRADITIONAL MARITIME** Fair by Ånikap/Aboa Mare was held on 31.10-1.11.2019. The fair collected most of the Finnish maritime cluster as well as some foreign visitors in one place, to create a great place for making new acquaintances and meeting old ones. During the Fair ENÅ organized a career day-event where students got answers to a bunch of questions one would surely hear while walking through the hallways of the school, and a presentation of possibilities within the branch that some had maybe not thought of.

**AFTER THE KEYNOTE** speech by Alexander Avanth had kicked the fair in motion, Santeri Lunkka from Traficom took over the stage to tell about certificates we are studying to acquire in order to prove competence, not only to ourselves, but future employers as well.

The second speakers were Akseli Koivisto and

Rasmus Welters telling about their experiences of life as a cadet and the practical side of it from the point of view of a student.

After we had got info about getting our papers in shape and an effective way of gaining onboard experience it was time for Mimmi Niiranen from VG-shipping to take the stage. She works as a Crewing coordinator and came to give advice on what she and her colleagues look for while searching for new crew members. Everything from required certificates to tips for a personalized application letter were covered which surely was a huge aid in helping land the perfect job onboard.

**LAST BUT NOT** least Anton Svanström, who works as a deck officer on a yacht, came to tell about the fast growing industry of yachting. Students got a peek behind the mysterious world of mega yachts and some helpful tips on how to get into the industry.

On Friday, as a part of the fair, a workshop led by Alexander Avanth was held for leading operators within the maritime branch. Participants came from diverse companies within the branch and from several countries. The workshop was built on the principle of “backcasting”, where a future scenario is given and actions leading to it are built from this day to the time of the scenario.

The participants were dealt to groups of 3-4 people and given five future scenarios to study. The scenarios had themes such as an absence of flag states, scarcity of the human factor, ships as data warehouses, global connectivity and autonomous mobility. After getting acquainted with the scenarios the groups would pick two of them and then “backcast” them to this day. The basic blocks for creating the best way to prepare for a chosen scenario were playground, playmates and play-rules or with what, who and how to succeed.

While the groups of professionals worked on solutions on how to thrive in their chosen future scenarios students were encouraged to jump in to ask questions and partake in the process. In the short few hours period the groups had some eye-opening conversations about the core values and possibilities of the working environment of today and tomorrow.

**THERE WAS A** good spirit of embracing even the most absurd of ideas and trying to grasp the unknown with tools that may not even exist. After the time was up groups were tasked to pitch their idea of what should



be done “come Monday morning” in order to thrive in the future they had chosen to plan for. The ideas were pitched to other groups and students.

The intense day of planning for the future of shipping and working culture in general created some wild thoughts and lively discussion about what kind of a world it really is that we are building towards in this fast paced time of connectivity and development of technology onboard as well as onshore.

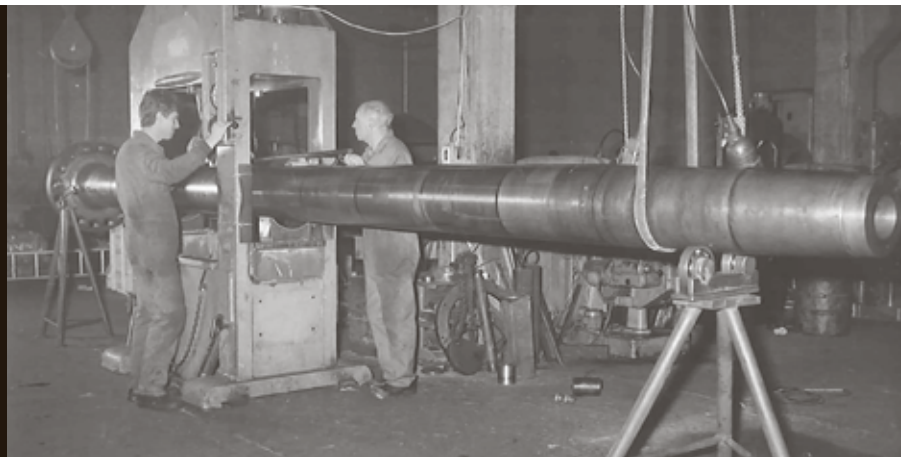
**THE STUDENTS INVOLVED** got a unique chance to meet the people shaping our current and future working environment, and the subject was so open to discussion that for a moment titles seemed like a thing of the past. Hopefully the participants also got a glance of the future of their companies both in the workshop as well as in the students they encountered.

The old saying “the only constant is change” is and will remain relevant through time, therefore it is events and interactions of different groups like these that make it feel like we just might have chance to build a bright future for the maritime community.

*Eetu Koskinen, Student*

## SCIENCE OR ART?

Straightening a bend shaft without using any heat and furthermore with full class-approval from the classification society is quite an accomplishment!



*If you ask the Danish company MarineShaft about their unique straightening technique they would probably describe it as both.*

### MANPOWER AND HORSEPOWER

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Of course the press itself, cannot define MarineShaft's success. How to operate the hydraulic press straightening a bend shaft, requires extraordinary manpower and skills.



MarineShaft has very skilled and committed employees with a high work ethic and teamwork. One of the managing directors Knud Andersen states when asked about the cold straightening technique:

*"Operating these powerful machines is not something you can learn from a book. Our straightening engineers have all learned the straightening technique from older and former employees – passing their knowledge onto the next generation".* Knud Andersen knows all about cold straightening, as he started his own career in the workshop as an apprentice learning the technique from his father, who was the straightening pioneer. (Photo above)

### URGENT REPAIRS

MarineShaft situated in Hirtshals, Denmark receives shafts from all over the world for repair and cold straightening. Shafts from 20 mm to more than 1,500 mm in diameter. Many of the repairs are urgent repairs due to an unplanned incident.

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## Konferens med workshop



Alexander Avanth var inledningstalare på konferensen.

**AUTONOMA FARTYG, FRAMTIDA** ledarskap och digitalisering var aktuella samtalsämnen under årets Sjöfartsmässa. Mässan samlade rekordmånga utställare i år, dryga 60, inklusive nästan alla rederier i Finland! Antalet utställande rederier är betydande även i nordisk skala.

Arrangörer av Sjöfartsmässan som ordnas vartannat år i Åbo är alumniföreningen för sjökaptener i Åbo, Ånikap rf samt Aboa Mare där Annina Rosenqvist var projektledare för mässan.

**I SAMBAND MED** mässan hölls en konferens med workshop, paneldiskussion och karriärevenemang. Huvudteman för konferensen var autonoma fartyg (paneldiskussion) samt framtida ledarskap och digitalisering (Future Leadership and Forecasting workshop). På torsdag diskuterade företagsledare och rederier nuläget och framtidsutsikterna för autonoma fartyg och på fredag utarbetade de en Roadmap om ledarskap och utmaningarna med digitaliseringen.

Bland mässutställarna fanns rederier, navigations- och IT-företag, uppstartsföretag inom sjöfart, varuleverantörer, Åbo hamn, myndigheter och andra organisationer inom sjöfartsnäringen. Huvudsponsor för mässan var det Åbobaserade konsult-, planerings-

och produktutvecklingsbolaget Elomatic Oy.

Det här var den nionde sjöfartsmässa som Annina Rosenqvist var med och planerade och genomförde. Detta år hade hon en stor roll som projektledare vilket betyder att hon i praktiken skötte om allt som skedde innan mässan och under mässan tillsammans med Aboa Mares marknadsföringsteam. Enligt Annina var det här den största mängden utställare hittills och vi tycker att det här nu är en passlig storlek på vår sjöfartsmässa.

**STÖRSTA GRUPPEN VAR** rederierna som presenterade sig för studeranden och rekryterade personal. De var mycket nöjda med antalet personer som besökte. Som andra stora grupper med utställare har vi företag som säljer teknologi till sjöfarten samt myndigheter.

– Det roligaste med att planera och genomföra sjöfartsmässan 2019 var den positiva feedbacken jag fick av utställarna om att det var tillräckligt med besökare och att de gärna återvänder om två år, säger Annina.

Vi hade ett utomordentligt samarbete inom Aboa Mares marknadsföring team när vi gjorde detta samt med alla som hjälpte till för att förverkliga sjöfartsmässan.

*Maarit Vähäkangas*

# Training with VR technology

**NOVIA UAS AND** Turku UAS have developed an application for maritime safety, which uses virtual reality (VR) technology. The first prototype of the application is in the testing phase, making it possible to test preparedness for dangerous situations and mechanical errors in different weather conditions at sea.

The VR application market is growing rapidly in Europe and all over the world. VR technology is not only used for entertainment purposes, it can also be used in technology and education. It creates a reality-look-a-like environment where you can move around and act with VR glasses and VR helmet.

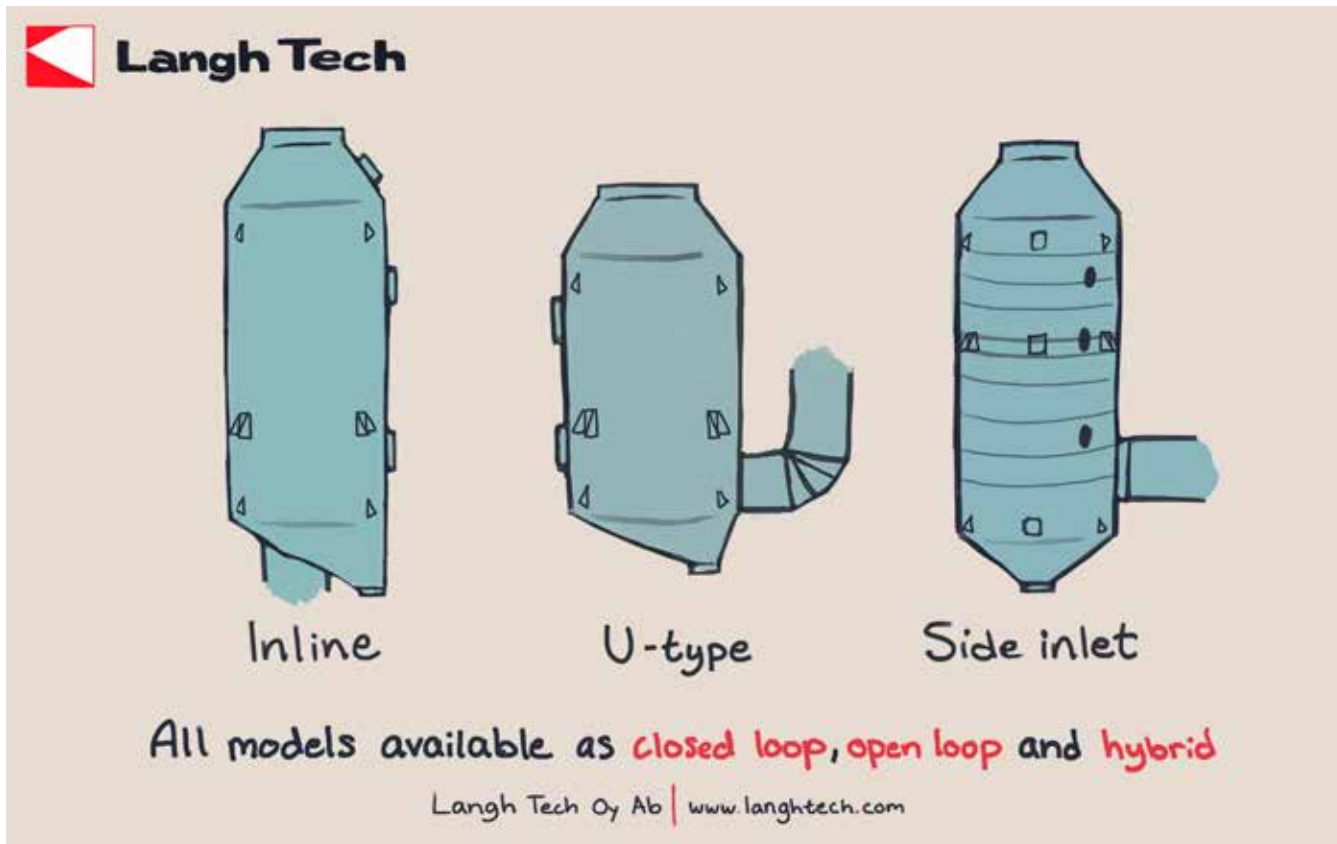
**IN MARITIME SECURITY**, the Virtual training application trains the user in assessment and preparation. In comparison to simulators, the VR application's advantages are scalability, mobility, user experience and direct feedback in different types of simulations

The purpose of the MarSEVR (Maritime Safety

Education with VR Technology) application is to train the user in virtual reality for different types of rapidly changing situations, hazard scenarios, like changing weather and decision-making.

With the MarSEVR prototype being tested in accordance to bridge simulator training at Aboa Mare in Turku, one can train for collision and mechanical failure. With the development, the application will carry 30 types of training situations for dangerous situations on ships.

**THE DEVELOPERS OF** the MarSEVR application, The Universities of Applied Sciences in Turku, Novia UAS and Turku UAS, presented a paper on the application at the Institute of Electrical and Electronics Engineers (IEEE) conference earlier this fall. IEEE is the largest technical professional organization for the advancement of technology. The paper about MarSEVR received the award for best conference article.



# Debating autonomous shipping



**AN INTERESTING PANEL** debate on autonomous shipping was held at Aboa Mare's Maritime Fair on 31 October 2019. Hosted by Captain Mikael Hilden, a well known profile in the cruise business, the main theme was if autonomous shipping will be reality and to what extent.

The panel participants were Sinikka Hartonen (Finnish Shipowners' Association), Ronny Eriksson (Långnäs Hamn Ab), Anton Westerlund (Kongsberg Maritime), Fredrik Östman (Wärtsilä), Marko Rahikainen (Traficom) and Palemia Field (ABB).

**"WE SEE THAT** the development will start with smaller projects and a higher level of technology on board. The development in domestic shipping with testing in small scale will in the future come up with solutions which might be adaptable also for short sea shipping or international shipping on the open seas. At this moment the unmanned vessel is something that will require a lot of work," said Marko Rahikainen.

"I think it is important to separate the hyped discussion that we have related to cars. When we talk about autonomous ships it's a gradual step where we introduce autonomous features that help first of all to make decisions on board. It is not about eliminating the people," Fredrik Östman added.

Ronny Eriksson underlined the importance of defining what we are talking about when we talk about autonomous shipping.

"In our mindsets we have a lot of different pictures of the future. The pessimistic answer from me to the question when will we have autonomous unmanned ships is that it will take at least 30 years more."

**SINIKKA HARTONEN BROUGHT** the shipowner's perspective into the discussion:

"I think that it comes to the business case. The level of automation will increase whenever an owner sees a business case. It depends on how well we can have the human beings and machines working together. Whenever we can see that empowering the people with the developed technology will be a good investment for the ship owner, then it will really start."

Anton Westerlund thinks that it is in the short term about finding the gains with the technology already developed or under development to introduce a safer and more efficient vessel operation.

"Now we are on a realistic level what we can actually achieve. There is no ship owner that will do this just for fun. We need to understand as equipment manufacturers where is that value that we will capture."

*Pär-Henrik Sjöström*

# A conditionally and periodically unattended Bridge



**THE RECENT DEVELOPMENTS** in sensor technology, data analytics and computing power enables an increase in the level of technology and automation especially in ship navigation, steering and control.

There is a clear difference between the technical readiness and capability of a vessel versus the status of usage of the vessel at any given time. In certain conditions, the crew onboard may be given the opportunity to change a vessel's operation from crew to machine operated. In 2017, together with Dr. Kalevi Tervo, we publicly presented the concept with the vision to provoke discussion.

From our standpoint, the motivation was not to get rid of the crew but to enable more efficient utilization of vessel crew, reduction in fatigue and increased safety. This could be achieved by enabling, from time

to time, an unmanned bridge provided that certain conditions are met

**ORIGINALLY THE NAVIGATION** watch consisted of the officer of the watch, the look-out and the helmsman. In modern times we already and almost permanently substituted the helmsman with the autopilot. If the situation so demanded the watch could be extended with the master, a pilot and an additional look-out. In exploring the possibilities and challenges in substituting the function of the look-out with a technology-based system our B0 concept challenges current thinking.

Rule 5 of Colregs (International Regulations for Preventing Collisions at Sea) puts special emphasis on lookout and states that "Every vessel shall at all

times maintain a proper lookout by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision."

This is further emphasized when the vessel operates in restricted visibility (Rule 19 of Colregs) wherein the role of the lookout man is paramount.

The purpose of the lookout is simple, so simple in fact that we tend to overlook it. As the purpose of the navigation rules is to prevent collisions, it follows that the purpose of the lookout is to collect the information required to avoid collisions. This fundamental reason for maintaining a proper lookout is something to keep in mind. A look-out's function can be divided into two specific areas; the safety of one's own vessel and of everyone else in the vicinity.

**VOYAGE PLANNING CONSISTS** of a basic idea to identify a corridor of sufficient free space to minimize navigational hazards or threats to the vessel along the route. The definitions of the conditionality are key to defining the safety parameters. Briefly, the aim is to identify anything that could create a hazardous traffic situation, with one hour designed as time for the appropriate crew to come to the bridge and assess the situation. Combined data available from bridge equipment with additional cameras will be able to continuously maintain situational awareness and generate an alarm. The key component is the sensor fusion engine.

In order to manage an unattended bridge unmanned for a period of time, monitoring and diagnostic equipment for critical equipment such as navigation equipment is required. Currently this is an OOW task, but in a B0 situation a system is required to monitor the status of the navigation equipment, such as the error of gyrocompass, radar performance, or stability of GNSS. In short, the ship or, at least its bridge, needs to be evaluated as a system.

**IN ORDER TO** maintain the unattended bridge status, the B0 conditions need to be monitored by means of technology. There should be at least two independent means for all measurement and situational awareness technologies.

Regulations require people to look out the window

due to the fact that for safe operation, one cannot rely only radar. The basis for the B0 bridge is to provide continuous visibility from the bridge with additional cameras and possibly other sensors which offer equivalent, or better, field of view and range as a human can have with the naked eye. The biggest challenge to the concept is the lack of numerical exact definitions of the requirements for a lookout.

**ALTHOUGH THE NUMBER** of crew, especially in oceangoing cargo vessels has decreased during the last decades, at least one person on the bridge is currently required regardless of the conditions. While this is very much justified in situations where the ship is approaching other ships or areas where more traffic is anticipated, crossing an ocean in very good and clear conditions can lead to a situation where the OOW is on the bridge for the entire work shift without touching any equipment or doing anything but looking at radar screens and outside the window making sure that there is nothing out there. This can cause mental fatigue with an associated loss of alertness and can lead to a situation where a human reacts too late to an event which could have been anticipated significantly earlier if the OOW would have been more alert during the situation.

**ENABLING A BETTER** quality of rest during good conditions when there is no need for major navigation actions has an impact on crew alertness and decreased fatigue when approaching coastal areas or routes which have traffic. The B0 concept enables the crew to use the time during the work shift more freely to tasks which will keep them more alert and increase the wellbeing at work. Moreover, at least for the majority of the crew, the working hours during the ocean crossing voyage could be closer to normal office hours. Together, this will most likely increase the safety of navigation in areas where manned bridges would be required.

The firm belief is that when alerted of an upcoming navigational danger, the bridge team will be more alert than when the situation is slowly building up over time.

*Eero Lehtovaara, Master Mariner (AFNI)  
Head of Regulatory and Public Affairs, SVP  
ABB, BL Marine and Ports*

# The lurking cyberthreats



**THE CREW OF** was preparing the cruise vessel Nohack for the 1,5-week trip over the Atlantic. This was a standard voyage. The ship had shifted between the Caribbean and the Mediterranean in the last 8 years. As usual, the ship was fully booked, and the weather forecast seemed to be very promising. As a modern passenger ship, the bridge is equipped with state of the art ECDIS equipment and no paper charts were therefore needed for the journey.

The navigational officer made sure to update all the necessary equipment and publications to meet the regulations. Everything went according to plan and the updates worked fine.

M/S Nohack departed from Texas on 10 April, bound for Alicante, Spain. However, after four days of sailing the vessel encountered serious problems. Both ECDIS systems went into lockdown. With a screen asking for a password. The vessel was hacked and the hackers were asking the company for 5 000 000€ for the password.

**VESSELS TODAY ARE** at an increasingly faster rate adopting new technologies and relying on digital solutions in everyday operations. More and more devices on board are getting connected to the Internet for allowing remote support. Traditional operational

technologies on board ships have not been connected to the internet but with today's IoT trend and improved connection capabilities that promising efficiency improvement of operations. The connectivity can lead to improved efficiency but might also open up new vulnerabilities for vessel.

Maritime environments include both traditional IT systems as well as specialised OT equipment. IT systems include systems like communications, networks, email, file-sharing, messaging and similar traditional IT services. OT systems include hardware and software that directly monitors or controls physical devices and processes on board vessels, such as navigation, radar, AIS, propulsion systems, power management systems, cargo management systems, ballast water systems, etc. The divided responsibilities can lead to increased risks if the understanding and the communication is failing between the parties.

**THEREFORE, THE INTERNATIONAL** Maritime Organization IMO adopted resolution MSC.428(98) on Maritime Cyber Risk Management in Safety Management System (SMS) and shipping companies need to be in compliance after 1 January 2021. The new guidelines aim to help shipping companies deal with IT vulnerabilities and managing cybersecurity risks.

Managing cybersecurity in complex environments like the maritime environment requires a structured and standardised approach that is based on regulations, standards and best practices to ensure a consistent, repeatable and auditable approach to managing cybersecurity.

Traditionally IT and OT have been separated but with the Internet and digitalisation of marine operations, IT and OT are merging and traditional stand-alone systems are becoming integrated. Disruption of the operation of OT systems may impose significant risk to the safety of onboard personnel, cargo, damage to the marine environment and interfere with ship operations.

**ALTHOUGH BOTH IT** and OT equipment are computer based, they have different priorities in terms of confidentiality, integrity, availability and the basic principles of security. Additionally, the principle of traceability has been identified as important in order to ensure detection mechanisms in the environments.

For IT systems, confidentiality and integrity are usually prioritised over availability in terms of security. It is more important to keep the sensitive data secure than available.

For OT systems these priorities are usually reversed, as the OT systems can directly affect the operations of vessels and hence impact the safety of human lives. The OT equipment needs to be available at all times and the integrity of the data needs to be ensured so that all systems function optimally. The confidentiality of the data is less important.

“Cybersecurity requires management commitment and a holistic approach to understanding cybersecurity risks in the organisation. The solution is not about simply installing a cool new product with fancy blinkenlights and buzzwords in the product specifications, but is rather a structured and complex process that focuses on the relevant risks and effective controls to mitigate those risks. It is about how to include cybersecurity into the daily routines and business as usual. Effective cybersecurity is about doing the right stuff in effective simple ways.” says Kim Halavakoski, CSO at Deductive Labs, a Cyber Security company specialized in the maritime sector.

**TO DEAL WITH** the increasing cybersecurity demands and requirements in maritime vessel environments,

## Generally two types of cyber attacks

**Untargeted (indirect) attacks** where the shipping company or vessel's system and information are part of many potential targets (malware/malware or virus, phishing, waterholing, scanning).

**Targeted (direct) attacks** where the shipping company or vessel's system and information is the target (social engineering, brute force, denial of service (DDoS), spear-phishing, supply-chain attacks, advanced hacking).

## Threat actors often included

**(H)activists** – highly skilled individuals or groups with ideological or political motives.

**Cyber criminals** – highly organised with good resources and budgets to achieve their end goals.

**Industrial spies** – usually highly capable and motivated by financial gain to reach their end goal.

**Opportunists** – external and internal adversaries that exploit an opportunity for personal gain or challenge.

**Insiders** – disgruntled insiders are usually opportunistic and unethical employees that seek financial gain or revenge.

**Nation states and military** – governments have vast resources and budgets to attain their goals.

**Terrorists** – politically motivated extremist groups or non-state actors using cyber techniques to cause physical harm, fear, intimidation to influence a political change.

ship owners need to start planning, designing and implementing security controls in the environment. This includes controls for people, processes and technology. Cybersecurity awareness and training is crucial and the personnel needs to be educated in cybersecurity in order to know how to securely operate the IT and OT equipment in the environment.

Policies, processes and procedures need to be created, taking cybersecurity into account throughout the lifecycle of the equipment, from design, architecture and implementation to operations, support and maintenance. The different technologies and assets need to be inventoried and their configurations needs to be documented and managed. Changes need to be documented and updates needs to be installed in

order to mitigate identified vulnerabilities in software and hardware. Logging and monitoring of IT and OT environments need to be implemented in order to detect and mitigate attacks against the environments.

As the digitalisation of vessels increase, the IT and OT systems need to integrate, communicate and collaborate with each other in secure ways so that the confidentiality, integrity, availability and traceability of all systems are properly ensured and managed.

**PERSONNEL ONBOARD VESSELS** need to understand the risks and implications of cybersecurity incidents for the safety of the vessel and its operations. IT and OT technology and equipment needs to be properly installed, configured and managed. Network segmentation needs to be ensured to separate critical systems so potential cybersecurity incidents are contained and restricted. In order to ensure cyber security throughout the supply chain, cybersecurity requirements need to be documented and communicated to all vendors and service providers and continuously monitored and audited.

By complying with the guidelines given by IMO, the ship owners and the operators will improve their operational reliability and manage safety and cybersecurity risks that can otherwise disrupt the operation of the ships. The operators need to document and improve their IT and OT management by identifying and managing the systems according to established policies and standards which improves the reliability, safety and security of the environment. The increased digitalisation of the maritime environment and the converging of IT and OT will enable new business opportunities and insights by analysing the data from all vessel equipment and devices in order to improve the business operation of ships.

Educating seafarers in safety and cybersecurity is central, and by implementing the right processes and tools for cybersecurity and safety in the maritime environment, the risk of exposure can be minimised and can be seen as a cheap insurance to ensure continuity of maritime operations.

*Ted Sjöblom & Mathias Mattsson, Marišto Oy  
Kim Halavakoski CSO Deductive Labs Ltd.*



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# Taking energy efficient shipping into the 2020s



**THE BRIDGE IS** dimly lit. All the various lamps, switches, screens and other common bridge paraphernalia are shining their indifferent light. The navigator and co-navigator are concentrated on conning their ship towards port. The voyage plan visible on the ECDIS displays contains the normal markings. Comments such as “shallow, reduce to lever 7” and “turning radius to maximum, 2 miles” are common in voyage plans, but in this case they are not included for safety but for energy efficiency.

The officers are following the screens intently, and as they approach shallow areas they reduce the engine power setting. The squat phenomenon which reduces the below keel clearance is well known, but many seafarers do not necessarily recognize the fact that the high stern waves produced in this context are the result of using engine power to make the waves, power that ultimately comes from burning

fuel. At the next turn they adjust the turning radius to maximum possible, to reduce the speed drop that inevitably follows from turning the ship. During the entire trip the autopilot settings are also adjusted according to the weather and sea area, again to reduce the fuel consumption.

**AROUND ONE HOUR** into the watch, the VHF radio crackles to life with a surprising message: “Thank you gentlemen, exercise stopped, internal debriefing and see you in debriefing room in fifteen minutes”. An energy-efficiency simulator exercise at Aboa Mare Training Center is completed. In the debriefing that follows the fuel consumption is analyzed and the efficiency in kilograms of fuel per nautical mile is calculated. This was a training exercise, but it could as easily be a scene directly from the bridge of a modern ship.

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When Safety Matters

Energy efficiency is very much a hot topic in international shipping. IMO has recently decided on a strategy to reduce greenhouse gas emissions by at least 50% to the year 2050 and further to reduce the GHG emissions from shipping to zero within this century.

The short-term measures are mainly implemented by the EEDI (Energy Efficiency Design Index) which, in three steps (in 2015, 2020 and 2025/23) makes it mandatory to reduce the carbon intensity of new ships by 30% to the year 2025. This is achieved by technical means. The next steps are mid-term measures to reduce by 40% until 2030 and long-term measures to reduce by at least 70% until 2050.

**ANOTHER WAY OF** approaching the emission reduction is by the SEEMP (Ship Energy Efficiency Development Plan), which requires the shipowners to achieve energy efficiency improvement by operational means such as, for example, weather routing, trim

and draught optimization, speed optimization and just-in-time arrival in ports.

The SEEMP, EEDI and another concepts hidden behind nice acronyms (EEOI, SECA, NECA) are based on the MARPOL convention, specifically annex VI from 2005/2011. MARPOL annex VI focuses on reducing the sulphurous oxides (SOx) and nitrous oxides (NOx) as well as GHG emissions. A great step in the cleaner direction is the implementation of the global maximum 0,5 % sulphur limit in fuel oil from January 1st, 2020.

Another tool to improve energy efficiency are the reporting schemes that have been implemented in the last few years. IMO's reporting system is the DCS (Data Collection System) which came into force in 2019. DCS requires the shipowners to report the ship's fuel consumption to the flag state, which in turn is required to report to IMO. The information is compiled into a database available to IMO and the flag states, to further their work to lower the emissions.

**INTERESTINGLY ENOUGH, THE** work on lowering the emissions from shipping is not just IMO turf, the European Union is also taking steps to improve the situation. The EU reporting system is called MRV (Monitoring, Reporting and Verifying) and it came into force in 2018. The system naturally applies only to ships calling at EU ports, as compared to the IMO DCS, which is world-wide. The EU has adopted a different view on the use of the reported information and actually made it public. The information is available on <https://mrv.emsa.europa.eu/#public/emission-report>.

It is perfectly plausible that a company looking for a carrier for their products might, in the future, use this freely available MRV information to select a shipping company that can show a better CO2 emission level than an otherwise similar competing company.

**ALL THIS DEVELOPMENT** is based on the principle of sustainable development as defined by the World Commission on Environment and Development, WCED, in 1987, also known as the Brundtland Commission. WCED defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs", which is a

definition hard to argue with. The sustainability principle is often misunderstood as comprising only the environmental aspect, which is a too simplified view. Sustainable development actually consists of three parts: environmental, social and economic sustainability, a trinity which should always be kept in mind when discussing future development.

The Brundtland Commission was the starting point for the modern sustainability thinking, which has developed through Rio 1992 (Agenda 21), the Kyoto Protocol 1997 and the Paris Agreement 2011. This has naturally also spilled over to the shipping business and puts us where we are today, facing the challenges mentioned earlier. Everything is a part of the whole and seaborne shipping is a major component of the modern world.

**DEVELOPMENT IS PROCEEDING** apace in the shipping industry. Energy efficiency measures are being implemented through technical solutions such as hull design, propulsion optimization, energy saving devices (ESDs), decision making support equipment, cleaner fuels and hybrid or battery systems. Operational measures are a part of the mix, using voyage, trim and speed optimization just to mention a few.

This development also creates the need for training of the seafarers. Various training institutions have introduced training schemes, many of them based on the IMO Model Course 4.05, Energy Efficient Operation of Ships. Aboa Mare Training Center is also riding the wave, offering the ECOTRAIN workshop for developing cost efficient and environmentally sustainable ship operation. Aboa Mare sees the potential of combining ecological and economic interests, the end result being a win-win situation: ECONomic and ECOlogical interests go hand in hand.

**AND WHAT WAS** the result of the simulator training we witnessed in the beginning? The students were able to reduce the fuel consumption by 1,6% , keeping the same speed and not losing any time. This does not sound much, but it is achieved by just adjusting the operating methods. Just by thinking a little and putting in a small effort. In the end, the energy efficiency comes down to small improvements here and there. Put together all the small steps and the seemingly impossible becomes possible.

*Magnus Winberg*



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# Skeppsbefäl med aktiv förening



**HELSINGFORS SKEPPSBEFÄLHAVAREFÖRENING** grundades 1875, några år efter att liknande föreningar grundats i Åbo och Björneborg. Föreningens historia finns bevarad i 125-årshistoriken "Sjösäkerheten var deras mål". Befälhavareföreningarnas betydelse minskade i och med att Finlands Skeppsbefälsförbund grundades år 1905, men många föreningar fortsatte verksamheten och samlade sjökaptener till olika diskussioner om aktuella sjöfartsfrågor.

Helsingforsföreningen tynade bort på 1980- och 1990-talen, men blev mera aktiv från århundradets början. Ordförande Timo Nenonen upptog kontakter med Kapteeniklubi i Estland. Tyvärr insjuknade Nenonen och ordförandeskapet övertogs av Kari Wallin som fortsatte samarbetet med esterna. Numera är det tradition att föreningens medlemmar avec reser över till Estland vartannat år och esterna kommer hit däremellan.

**I ÅR BESÖKTE** vi under ordförande Stig Sundbergs ledning Raseborgs ruiner och Ekenäs med våra estniska vänner. På samma gång lär vi varandras historia som både har såväl gemensamma som åtskiljande skeden.

I övrigt har föreningen olika föreläsare om sjöfart på våra möten och vi gör besök hos olika institutioner inom sjöfartsbranschen. Trots att en stor del av föreningsmedlemmarna är pensionärer finns det ett levande

intresse för sjöfartens utveckling. Föreningen har också gjort vissa uttalanden ifråga om sjöfart, senast gjordes ett förslag till ändring av båtförordningen till riksdagen. Förslaget kommenterades av föreningen. Föreningens anslutning till CESMA (Confederation of European Shipmasters' Associations) ger även föreningen information vad som pågår inom sjöfarten inom EU.

**VANLIGTVIS MÖTS FÖRENINGEN** på Handelsgillet i Helsingfors. För ett par år sedan väcktes idén om en Captain's Dinner där medlemmarna äter middag avec, med program. Detta igen ledde till en gemensamt sats med övriga befälhavareföreningar ombord på museifartyget Bore i Åbo senaste vår där sjökaptener från hela landet deltog. Denna lyckade tillställning, ordnad av Åbo Skeppsbefälhavareförening, får hoppeligen fortsättning.

Föreningens möten är väl besökta med omkring 25–30 deltagare. Det vi fortfarande hoppas på är att flera yngre sjökaptener skulle delta i verksamheten. Om du vill bli medlem är det bara att anmäla dig till vår nuvarande ordförande Stig Sundberg (e-post: stig.sundberg@pp1.inet.fi) eller viceordförande Lauri Vuorinen (e-post: vuorinenlauri02@gmail.com). Kravet för medlemskap är genomförd sjökaptensutbildning.

*Sven-Erik Nylund*

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# Bygger kontaktnät i EU

**DEN 1 APRIL 2017** anslöt sig Helsingfors Skeppsbefälhavareförening till Confederation of European Shipmasters' Association (CESMA). Åbo Skeppsbefälhavareförening är också med i projektet.

Det var en lång diskussion inom föreningen innan vi anslöt oss. Orsaken var kostnaderna och resekostnaderna, men CESMA erbjöd oss att bli observationsmedlem och då är kostnaderna på en nivå som föreningen klarar av. Detta erbjudande accepterade vi.

Föreningen har rätt att framföra sina egna anföranden direkt till CESMA och delta på årsmötet.

**VI FÖRSÖKTE FÅ** med flera föreningar men den enda som var intresserad var Åboföreningen. Orsaken till att vi gick med trots att vi är en liten förening uppe i norr är att man behöver kontakter utanför gränserna. Annars kan vi inte påverka någonting. Det är ju så att mer och mer beslutas i EU och har man inga kontak-

ter där så kan man inte påverka någonting.

Vi är inte ute efter förändringar – det är vi alltför små för – men vi får viktig information om vad som är på gång inom sjöfarten inom EU, och det är nog så viktigt. Världen går framåt varje dag och vi måste vara med, annars blir vi efter. Sjöfart är en global näring och det måste vi acceptera.

**EN GAMMAL FÖRENING** som Helsingfors Skeppsbefälhavareförening har också lyckats ändra lite på sina metoder för att sköta saker och ting och det gör att vi kan se framåt när vi har en röst i EU. Det gäller också Åboföreningen.

Jag har haft möjlighet att träffa CESMA:s ordförande Hubert Ardillon och viceordförande Dimitar Dimitrov och då fick Helsingfors Skeppsbefälhavareförening ett ansikte i CESMA, vilket är betydelsefullt när man ska bygga upp kontakter. Trots att vi lever i en digital värld så är de personliga kontakterna mycket viktiga.

**CESMA GRUNDADES 1995** och dess medlemmar är skeppsbefälhavareföreningar och några enskilda personer från tolv nationer inom EU. Syftet är att representera europeiska befälhavare i Europeiska kommissionen och få deras synpunkter hörda i det Europeiska parlamentet.

CESMA är en aktör inom EU:s maritima industri med sjösäkerhet, miljö, utbildning och träning på agendan för att säkerställa europeiska sjömäns kompetens. Många av de ärenden som har tagits upp har gått vidare till EU-kommissionen för att behandlas där. CESMA är och har varit representerat i ett antal av EU:s program angående sjöfart, bland andra METNET, EMRF, MARINS och SAGMAS. CESMA är inblandad i kvalitetsjöfart inom Europa.

CESMA undersöker och presenterar också operativa problem inom sjöfartsindustrin och ger konsult- och praktisk hjälp till dem som behöver.

CESMA:s sekretariat har sitt huvudkontor i Amsterdam och 12 filialkontor på andra platser i Europa.

*Stig Sundberg*

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