

THE DANAOS SHIP NEWS

A SEMI-ANNUAL EDITION OF DANAOS SHIPPING CO. LTD.

ISSUE #16, JANUARY 2019

20th Annual Marine Money Greek Ship Finance Forum



The 20th Annual Marine Money Greek Ship Finance Forum took place on Tuesday, October 16th, 2018 at the Athens Hilton Hotel. Dr. Coustas and Mr. Prokopakis, together with other leading Shipowners, discussed the changing Greek shipping and finance landscape and how they have shaped their companies to adjust to the trends, staying ahead of the crowd.

During his panel discussion, Dr. Coustas mentioned that it is of vital importance for a shipping company to be able to adapt to new technological and financial models. Additionally, he also touched upon the decision his company made to invest in the Container industry, an industry which he believes has had tremendous growth during the recent years and proven to be very profitable.

Dr. Coustas also emphasized the importance of technology in the quest to decrease bureaucracy and costs and increase time efficiency. He concluded, by emphasizing that the gateway into capital markets is of vital importance, as those provide access to new capital.

Mr. Prokopakis' panel, delved into one of the hottest topics currently under discussion in the shipping industry, the use or not of Scrubbers. Mr. Prokopakis, mentioned, that for DANAOS the Scrubber question could be easier to answer, as their utilization is linked with the preferences of their Charterers. The issue of heavy fuel oil, will trouble the global shipping community for a long period and the forces of supply and demand, will finally be those that influence the decision of the shipping companies. He added, that whilst a small number of vessels will become equipped with Scrubbers, compliance with the new fuel requirements for the majority of vessels is inevitable, one way or another.

Finally, he stated that the decision to install a scrubber may result in to a win-win case for the Owner to secure say a 3 year charter and the charterers to enjoy the use of cheap fuel.

*Tania Mermiga
Social Media & CSR Manager*



Message from the President & CEO

Dear Friends,

After the successful refinancing exercise, we are now examining all the opportunities in the markets and at the same time getting ready for the challenges that 2019 is bringing.

The container market after a strong second quarter started to fade towards year end, with rates of the smaller tonnage in particular becoming soft. Fortunately we have small spot exposure in this market and all our vessels are profitably employed.

This last period was extremely busy with our study of scrubber installations and we have currently a plan to fit open loop scrubbers on up to eleven large vessels.

At the same time we are actively involved in the preparation for the 2020 Sulphur Cap on fuel oil which will require all our personnel on board and ashore, to cooperate intensely in order to ensure smooth transition and compliance.

This fuel oil changeover will require significant operational skills to avoid vessel safety compromises and I am sure that all of you will give your best self to prove Danaos operational excellence.

Thank you for all your efforts and look forward to more good news.

John Coustas



Message from the Senior Vice President & COO

Dear Fellow Members of the Danaos Family and Colleagues,

Let me share with you some key events of our Company during 2018 and some of my thoughts for 2019.

Danaos had two major achievements in 2018. The successful completion of the refinancing of our loans until 2023 and the conclusion of our negotiations for installing scrubbers on 6 of our spot vessels, securing at the same time a long term charter with MSC. We have also agreed to install scrubbers on the 5 large HMM vessels at very good terms.

For this year we have two major challenges to face:

1. A lower than expected growth of the global economy.
2. Our fleet's implementation of the 0.5% Low Sulphur Fuel Oil.
- 3 The establishment of the performance monitoring (fuel oil consumption) of our time charter vessels by the charterers and the scoring of our vessels by the charterers versus the competition.

However, I am confident that it will be a good year for our company and our employees.

I am confident due to the high professional standards of our Crew and Office staff.

I am confident due to our technological superiority over our competitors, in maintaining and monitoring the performance of our vessels, to provide the best service to our customers.

But most of all, I am confident due to the family spirit of all of us working at Danaos.

Thank you all for being with us, working with us and growing with us.

Iraklis Prokopakis

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4th NAFTEMPORIKI Shipping Conference



Dr. Coustas was amongst a panel of speakers at the 4th Naftemporiki Shipping Conference held on October 3rd, 2018 at the Megaron, Athens Concert Hall. His panel discussion focused on "International geopolitical developments, free trade, resurgent protectionism and its repercussions on the shipping industry".

Over 500 Greek representatives from the Maritime Industry attended the Conference whose theme title this year was "Greek and European Shipping Setting sail for the future".

*Tania Mermiga
Social Media & CSR Manager*

AMVER Awards for Danaos Shipping

DANAOS NEWS

We are pleased to announce that Danaos Shipping has been ranked 2nd and awarded with the "AMVER System Fidelity Award to Greek Shipping", in recognition of our continuous enrolment in the AMVER System.

Danaos has a long standing presence in the AMVER System, spanning for more than twenty years, during which we have been a proud participant achieving a high ranking in the relative list. DANAOS, not only encourages but also supports the AMVER System as a standard policy that promotes the position of all its fleet vessels towards the US Coast Guard response.

Danaos is proud and happy to enroll almost all of its fleet vessels in the AMVER System, targeting to save more lives at sea, whilst it deeply appreciates the Fidelity Awards to be received

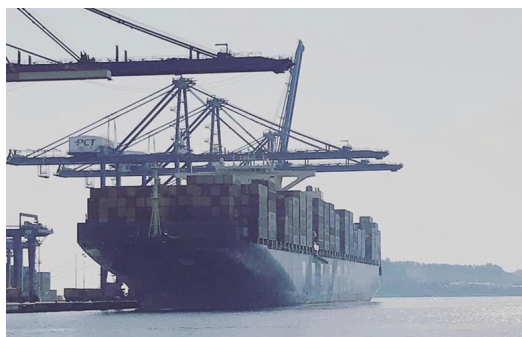
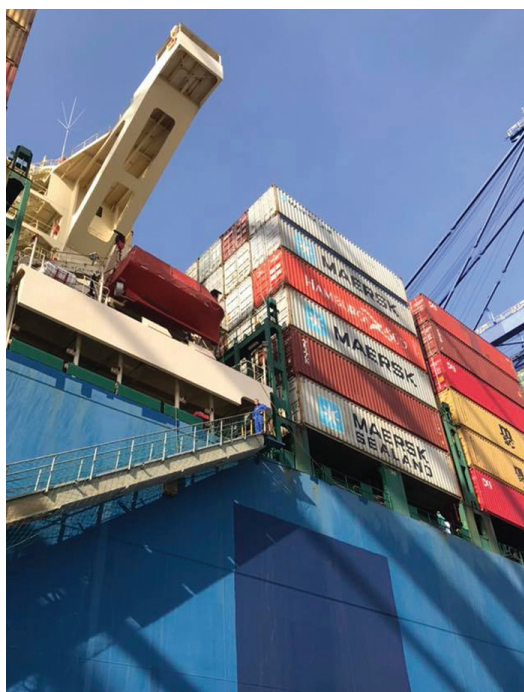
commemorating its long-lasting efforts towards that precious goal. We share the care!

*Tania Mermiga
Social Media & CSR Manager*



DANAOS Piraeus welcomes one of the family's Giants!!! Onboard the MAERSK EXETER

DANAOS NEWS



*Fotini Kiramariou
PA to the CEO*

Danaos Shipping Co. Ltd. - 3rd Annual ISM/DOC Audit Seamless with ISO 9001, ISO 14001 and ISO 50001 Audit

DANAOS NEWS

For one more year we are pleased to announce that the Company's 3rd Annual ISM /Document of Compliance (DOC) Audit was completed without Non-conformities or Observations on the 26th of October 2018.

Concurrently with the ISM, compliance with ISO 9001, 14001 and ISO 50001 standards was verified successfully.

We thank all those onboard and ashore for

their efforts which contribute to consistently positive results over the last years.

*Vassiliki Giannakou
SQE Coordinator*

When a box changed history: the shipping container story

ARTICLE

The shipping container might seem an unlikely candidate for the most influential invention of the 20th century but it had a bigger impact than that of the airplane or the microchip.

It is difficult to believe now that until the 1960s virtually all goods were shipped around the world unpacked, that is, crammed into the hold of old fashioned cargo ships. Bulk cargoes, like grain or coal are still transported unpacked in the hull of a ship, generally in large volumes. Break-bulk cargoes however, are transported in packages and are generally manufactured goods. Before the advent of containerization, break-bulk items were loaded, lashed, unlashed and unloaded from the ship one piece at the time.

While several people have toyed with the idea of putting cargo into boxes since the 18th century, the idea that dramatically reshaped the world's economy came from a man with little experience in shipping who owned a trucking company, Malcom McLean from McLean trucking.

Saving up money from his job pumping gas, McLean bought a truck and funded the trucking company with his siblings. He built the company into the second largest trucking company in the United States.

McLean understood that if transportation could be integrated, the vast expense of shifting freight from land to sea and back again, could be cut significantly. So he innovated.

McLean started buying ships. At first he tried transporting the loaded trailers by sea as they could be wheeled on and off boats but this was not particularly economic. The answer was to remove the trailers. Cranes would lift the boxed payloads from the truck's trailers, stack them on and below deck and reload the trucks with incoming, standard-sized boxes.

Thursday, April 26 1956

This is the date that quietly marked history and began a process of change that made the world what it is now.

The SS Ideal-X, an ageing tanker, departed from the Port of Newark and docked in the

Port of Houston five days later. Part of the cargo consisted of 58 35ft containers. These containers were then loaded onto trucks. Back then longshoremen hand-loading a ship would cost \$5.86 a ton. Shipping containers brought the cost down to 16 cents a ton. Freight costs fell from 25% of the product price to negligible levels.

The "Container Venturer" was another early attempt at integrated transport in 1958, designed to operate between England and Northern Ireland. She carried topped wooden containers that were used on British Railways. At the same time, the American SeaLand shipping line began a service between New York and Florida using 16m (40ft) and 8m (20ft) containers, suitable for US roads. It took time to set up an infrastructure, until 1966 where SeaLand's "Fairland" made the first transatlantic container voyage, producing a rapid growth spurt.

The demand for labor that once existed in Port cities has diminished very significantly. Using container shipping made as many as 19 out of 20 longshoremen unnecessary and changed the lives of sailors, who were already undertaking a dangerous and physically demanding job. The other big loser was the dockside workforce. Some dockworkers became crane operators and managed to increase their salaries through mechanization, however many more lost their jobs.

As containerization became a global phenomenon, Ports had to rethink their operations. As the ships were getting bigger it became apparent that Ports had to get bigger space on the dock to store the containers. Many started to convert existing docks, knocking down sheds as much as they could, but these proved not to be as efficient as developing new terminals on new sites to accommodate the container vessels that were coming in. Ports began to move from their traditional locations, the old dock-sides in the heart of the cities and were moving into what are called Greenfield sites where new port facilities were built.

It also became apparent that retrofitting existing cargo ships was impractical and costly, so as a result an entirely new fleet needed to be built. Even if this has created many job

opportunities in the building of the vessels, many traditional shipping lines folded, unable to bear the expense. For a couple of decades, the unions fought containerized shipping, but with its incredible benefits, such battles were a lost cause.

Containerized shipping has completely transformed cargo transportation, opening up international trade and a world economy, the likes of which was previously unheard of. This of course would not be possible if everybody did not adopt fixed box dimensions and then the design of a ship to fit those dimensions of boxes exclusively. The standard box that is imposed by the International Standards Organization is identified as being eight foot high, eight foot wide and 20 foot long.

There are currently over 17 million shipping containers in the world, and five or six million of them are currently being shipped around the world on vessels, trucks and trains. In total they make around 200 million trips a year. It is estimated that there are 10,000 shipping containers lost at sea every year. This means that about 90% of non-bulk cargo worldwide is transported by container and modern container ships can carry over 21,000 TEU. They rival crude oil tankers and bulk carriers as the largest commercial vessels in the ocean. Today's largest container ships measure 400 meters (1300 ft) in length. They carry loads equal to the cargo-carrying capacity of sixteen to seventeen pre-World War II freighter ships.

The cargo container ship is a symbol of the modern world and has transformed merchant shipping. It is uncompromising rectangular and its functional doors and corrugated sides make it ugly to some eyes. However, being able to contact a freight forwarder to export or import your goods to China, Europe, and Australia or anywhere around the world is made possible because a Box changed the world.

*Capt. Stylianos Petronios
Master Mariner*

Representative in The United Republic of Tanzania

DANAOS accepts the Scrubber Challenge

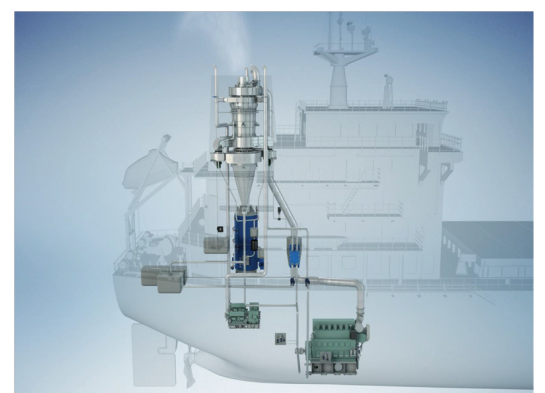
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In view of the "2020 SULPHUR CAP" coming into force on January 2020 and the widespread upcoming installation of Scrubbers on vessels, enabling them to comply with this new regulation, Danaos could not resist being part of this global maritime technical innovation.

Having MSC as a commercial partner on this plan, Danaos is going to proceed with Scrubber installations on 6 vessels: M/V Europe, America, Pusan C, Le Havre, Catherine C and NYK Leo under long term charter with MSC, with the M/V NYK Leo being the first vessel to undergo the installation in March 2019.

The successful installation of Scrubbers onboard our fleet is a challenging project for Danaos and of great importance. New technological knowhow will be acquired through this commercially efficient project, which we believe is going to prove fruitful.

*Georgina Tsiona
Operator*



LNG as an Alternative Fuel: operational and economic considerations

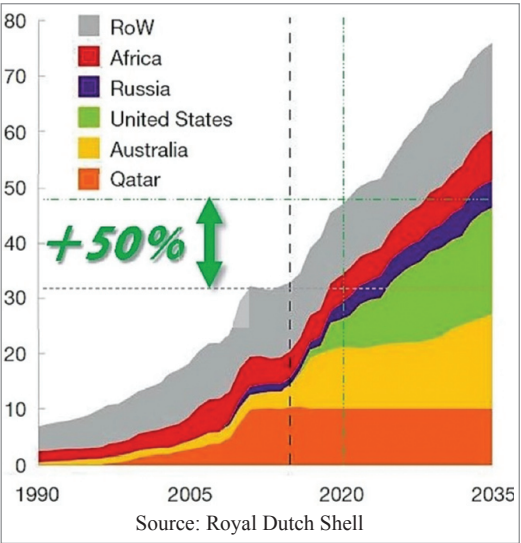
The regulatory demand for even lower SOX globally, brings the shipping industry to a crossroad, where sooner or later the stakeholders will have to choose between burning low Sulphur fuel, installing scrubber systems or turning to alternative fuels, the main candidate of which is LNG.

The present article is intended to outline the economic and operational aspects of the installation and use of LNG as the main marine propulsion fuel and to present future challenges that the shipping industry has to overcome regarding this difficult and multiparameter decision.

Needless to say, the Global Energy Market today is in a trance.

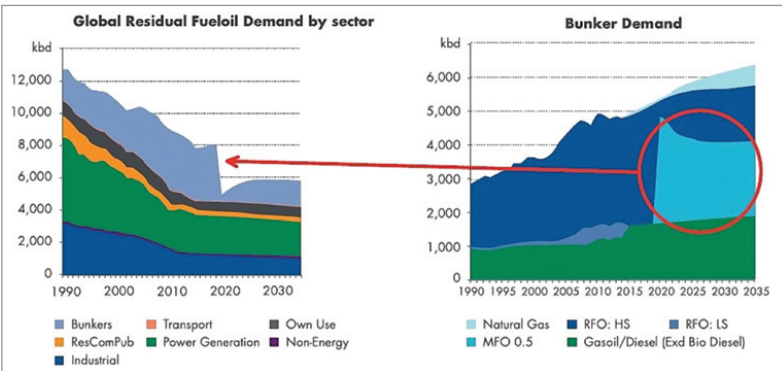
But let's see the bigger picture, it is not easy to forecast how the price of LNG will develop, but it should be supply-demand driven. And one thing that we do know is that there will be a high increase in the supply of LNG between now and 2020 even up to 50%.

On the other hand, demand in the shipping and generally in the transportation sector, emphasizes that correlations will change with the need for low sulfur fuel production to be ejected. As a result, it is anticipated that the price of LNG will go down while the price of LSFO will go up. And the question that arises is:



After 2025 will there be RFO available and if so what will the price of it be?

In addition to the fuel price difference, there are some commercial advantages apart from the compliance with every existing rule. The ability to attract charterers with environmentally friendly profiles, while at the same time, enhancing the social image of the company and increasing its reputation. The favorable funding with integration into Governmental

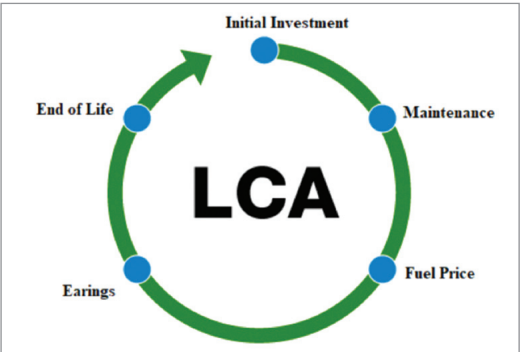


programs and of course the increase in the value of the vessel as an asset, when the need for eco-friendly vessels will grow.

Last but not least, it is important to mention that LNG as a fuel is traded in USD / unit of energy (MMBTU) and not per ton, which is verified on the spot by using spectral analysis. As a result, the common fraud, in both quantity and quality, of the received fuel will be reduced.

On the other hand, the counterpart is the big initial CAPEX.

But is this a reality?



Quantitative studies have shown that scrubber installation, along with NOx cleaners admittedly, have a lower initial investment cost. However, a life cycle cost analysis of the ship due to maintenance and the ever-increasing spread between gas and oil prices, indicates that LNG is the most advantageous option, while the payback time of the gas propulsion system is also diminished as long as the availability of scrubbers in the market is low and as a result the use of the expensive LSFO in some cases, at least for some period of time, becomes a necessity.

There are also some hidden benefits, like the fact that there is no need for separators and auxiliary boilers installed in the vessel and on the same time longer time between engine overhauls, which means reduction of maintenance cost and all these because of a clearer fuel. In the meantime, lower emissions mean compliance with every rule and regulation, elimination of SOX emissions once and for all, significant reduction of NOX and particulate

matter, and a small reduction in greenhouse gas (GHG) emissions.

In other words, LNG is a sustainable solution that the maritime industry has today, but there are also some challenges that the energy market has to face.

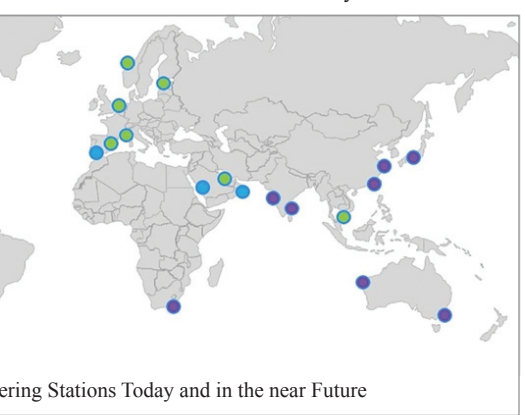
The lack of infrastructure and bunkering facilities is a reality, but

the industry as well as the producing countries are aware of the situation and have already launched investments in this direction, with many new bunkering stations all over the world by 2022 as shown, while governments are increasingly expressing interest in promoting the use of the green LNG solution. LNG Bunkering Stations Today and in the near Future

Another major challenge, is the proper training of people on board in order to overcome the difficulties that may occur. However, LNG, unlike many other technologies that promise clean and ecofriendly propulsion, is not a new idea. There are seamen in LNG Carriers that operate them with a high level of professionalism, regularly trained in special facilities and simulators, resulting in a minimal number of accidents on such ships despite their special needs.

As far as safety considerations are concerned the main hazard of LNG is the cryogenic temperature and the high pressure of the tank, which the fuel has to be kept in, in order to stay in liquid form. The danger of a leakage which might lead to brittle behavior of the steel structure can be avoided with the use of double wall piping and with periodical inspection and maintenance.

Moreover, LNG in contrast to oil in the event of an accident or leak evaporates directly and therefore there is no possibility of an oil spill. Also due to low flammability in the atmo-



sphere there is a very low probability of ignition unlike oil vapors. Furthermore, a lot of people who are against the use of LNG claim that because of its lack of natural odor it is not safe to be on board. The answer on this can be the installation of CH4 gas detectors in some critical places where a leakage can begin.

All in all, regarding green and sustainable shipping, there are only few viable solutions on the table. Our mission as engineers is to ensure that these solutions will continue to evolve and that in any case the protection of the environment and the people on board the vessels will be our first priority.

Costas Sardelis
Fleet Technical Coordinator

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2) "Shipping in the 2020 era-selection of fuel and propulsion machinery", Business white paper, Wartsila
3) "A Fuel for the Ages", LNGINDUSTRY, Sean Bond, ABS, USA
4) "Costs and Benefits of LNG as Ship Fuel for Container Vessels", MAN Diesel & Turbo

ALBA Career forum

Danaos Shipping attended the 26th ALBA Career forum, organized by the ALBA Graduate Business School. We interviewed students from the MSc in Shipping Management program who could become strong assets of the Danaos family in future.

The Forum was a great opportunity to meet with the students and discuss their skills and personal characteristics, to see if they match our company's working environment.

Georgia Pastra
HR Assistant & Training Coordinator



Reefer Containers training course



Following the increasing need for proactive monitoring of reefer containers on board our vessels, the Danaos Shipping Operations department organized the 1st training course for reefer containers run by Mr. Richard Lawton, Technical Director at Cambridge Refrigeration Technology.

The course which took place on Wednesday 01/11 at the Danaos Building, where Crew officers and office personnel attended.

Exercising due care and proper monitoring of reefer containers by the Fleet's Officers is of major importance, since damages incurred

on such containers could result in really large claims.

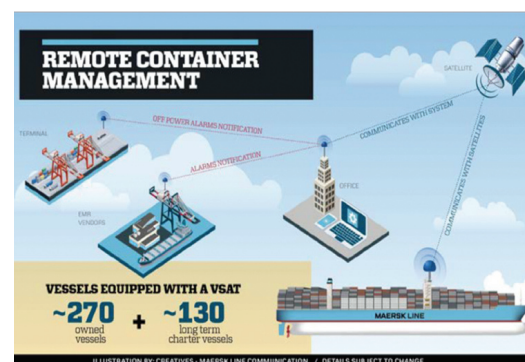
The course focused on matters such as Fundamentals of Cargo Carriage, Integral Containers & Refrigeration Systems, Controlled Atmosphere Systems and Examples of Typical causes of Claims.



DANAOS NEWS

Further courses on Reefer containers shall follow to enhance the efficient monitoring system onboard and finally minimize potentially unpleasant claims.

Georgina Tsiona
Operator



External Audits

We are pleased to advise that the following vessels under our management have passed successfully 3rd-party ISM/ISPS audits for the period 7th June 2018 – 3rd December 2018:

Vessel	Port	Non-Conformity	Observation
AMALIA C	Kaohsiung	NIL	1
CATHERINE C	Manila	NIL	NIL
CMA CGM MUSSET	Malta	NIL	NIL
CMA CGM NERVAL	Piraeus	NIL	NIL
CMA CGM RABELAIS	Piraeus	NIL	NIL
EXPRESS ARGENTINA	Singapore	NIL	NIL
EXPRESS BRAZIL	Houston	NIL	NIL
GENOA	Antwerp	NIL	NIL
MSC ZEBRA	Cristobal	NIL	NIL
PROGRESS C	Pusan	NIL	1
SUEZ CANAL	Long beach	NIL	NIL
ZIM RIO GRANDE	Novorossiysk	NIL	NIL

The above findings have been evaluated in order proper corrective and preventive actions are decided to avoid re-occurrence.

The below have undergone successfully 3rd-party ISO 14001 and/or ISO 50001* audit:

Vessel	Port	Non-Conformity	Observation
CMA CGM MOLIERE*	Algeciras	NIL	NIL
CMA CGM NERVAL	Piraeus	NIL	NIL
PERFORMANCE	Piraeus	NIL	NIL

Thank you for your continuous support.

SQE Department

Newly joined!

We welcome:

- **Ms Aikaterini Katsiada**
Assistant Internal Auditor
- **Ms Ioanna Vouloutsi**
Supply Operator
- **Ms Aikaterini Nika**
Assistant Accountant
- **Mr Theologos Giaglis**
Assistant Fleet Manager
- **Ms Maria Karakasidou**
Technical Secretary
- **Mr Antonios Georgiou**
Fleet Coordinator

“Drug trafficking on board: how it is done and how to deal with it”

ARTICLE

Over the years drug dealers use the shipping industry to move drugs all over the world. Even if shipping companies try to prevent drug smuggling onboard, this is the golden age of drug trafficking and no shipping route can be considered safe. Many cases have been reported where crew members have hidden drugs onboard their vessels. Sometimes traffickers use blackmail and intimidation to coerce crew members to be a part of their scheme.

Ways of getting drugs onboard the vessel:

- In vehicles, trailers or coaches
- By visitors (hiding a package on the vessel)
- By workers (cleaning crews, maintenance personnel, stevedores, hired security personnel)
- In the vessel's machinery or hull
- In containers or packing

Also, the drugs are hidden in ingenious ways. There have been cases of divers attaching drugs in waterproof bags placing them carefully below the waterline, the hull, remote and difficult accessed areas on the vessel.

Every year more than 420 million maritime containers move around the globe making up some 90 per cent of the global trade. However, despite these flows rapidly increasing, only two per cent of containers are inspected, that renders smuggling through containers easier and preferred by the smugglers. Also, whoever has access to the containers can easily load them with drugs, making it also hard to detect the associated party. For example in a cargo full of bananas smugglers replace them with fake bananas filled with drugs.

In some cases even the whole container, which has been declared with false information, holds only drugs. Although efforts have been

made to detect tampered containers by scanning them, as is the case with Brazilian customs since 2016, the results have been disappointing.

Other typical locations where drugs are hidden within the vessel

- Hull (divers put drugs on the vessel)
- In the engine room and machinery spaces
- Cargo spaces (most common)
- Spaces where visitors usually go (bridge, mess room, office, engine room)
- Lifeboats stores, in the medical stores and fire extinguishers
- Oil/fuel and water tanks
- Main deck areas (for example storage boxes)
- Store rooms (boxes, crates, freezers)
- Ballast tank, void spaces

Guidance to a crew member when drugs are found on board:

- Do not open the package
- Feel, handle or touch the substance only wearing face mask, gloves and a protective suit
- Do not breathe in fumes or vapours
- Be patient and relaxed
- Do not eat or drink the substance to understand what is it
- Wash hands and brush clothing

Masters should always notify and follow the instructions of the company. If drugs are found at sea the authorities of the next harbor should be informed ahead and prior to the arrival of the vessel within their jurisdiction. Also, Customs authorities should be notified as soon as possible.

Steps the Master must follow:

- Inform the company

- Call the authorities
- Help the authorities with their investigations

To sum up, proactive security measures should be taken to prevent such incidents occurring altogether. Such preventive measures, narrow down the chances of a drug trafficking incident occurring onboard, by detecting it but also averts smugglers from even trying. Planned, random and unexpected searches of the vessel can be very helpful, if carried out rapidly and adequately. While an established and constantly changing system of check points for anything or anyone boarding the vessel should include a thorough search and after a point a complete segregation of external communication. Moreover, a constant monitoring of the vessels areas, with sufficient lighting should be made, with continuous watch keeping by a shuffled pairing of crew members, announced at the latest possible moment. All areas of the vessel should be constantly checked, including the most difficult ones to be approached (below waterline), before/after the vessel docks and between ports.

*Karolos Karachalios
Legal Department Trainee*

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- Drug Trafficking and Drug Abuse On Board Ship, Forth edition- 2017
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- Bikram Singh, Precautions and Safety Measures to Curb Drug Trafficking Onboard Ships, October 7, 2017

MRM Training: Is it necessary?

DANAOS NEWS

During the course of our summer internship, the Danaos trainees underwent MRM training. An exceptionally interesting training method, that includes case studies and bridge simulation, which mainly aims at raising awareness of behaviour at sea.

Maritime Resources Management (MRM) is a human factor training programme aimed at the maritime industry. MRM training was launched in 1993 – at that time known as Bridge Resource Management (BRM) – and aims at preventing incidents in maritime operations caused by human and organisational errors.

In MRM training it is assumed that there is a strong correlation between the attitudes and behaviours of the seafarers on board and the cultures that these seafarers belong to – national, professional and organizational culture. Important target groups for MRM training are therefore, besides ships' officers and crew, all people in shore organisations who have an influence on safety at sea and the work on board.

MRM training concepts

The MRM course is:

- changing attitudes – not skills
- focusing on crews as intact teams, not a collection of competent individuals
- addressing crew member attitudes and behaviour
- providing two sets of objectives: training objectives and specific behavioral objectives
- providing computer based training for transfer of facts
- utilising case studies and human interaction



to change attitudes

Of course someone could say: “can we learn something in theory without practice? To be honest, sometimes an incident can make us more aware when it comes down to our attitude rather than the theory itself, but the effects of an incident (or an accident) are unpredictable (and possibly fatal). Therefore, MRM sets the basis (theoretically and in practice) so we can avoid mistakes and to minimize human error.

Finally, MRM is a training that can not only affect our office work environment, but also our daily lives and routines, as it is a more responsible and effective way of thinking and behaving. This way of attitude, in the end, cannot only be one person's responsibility (e.g. the Master's), it is everyone's responsibility (and even obligation) to love his/her job, to be professional, to love ourselves. Always remember that safety is everyone's job!

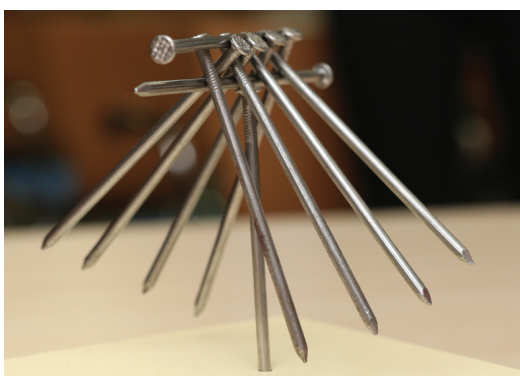
*Konstantinos Tzallas
Crew Department Intern*

Danaos Managerial Conference 2018

The 2018 Danaos Managerial Conference took place at our Piraeus premises on Friday the 2nd of November 2018. Once again, it was a great opportunity to meet our colleagues from all offices abroad and exchange with them thoughts and ideas on our teams' performance and ways to ease and cultivate the communication amongst our offices and vessels.

Dr. Coustas and Mr. Prokopakis welcomed the participants and opened

the event with a warm message. The presentations of our representatives followed shortly after, with each office giving their annual report, discussing statistical data on crew hiring, retention and training, as well as proposals for the year ahead. After the lunch break, a Danaos workshop also took place titled "Danaos beyond Limits", explaining that working as a team we can achieve more than we may imagine doing by ourselves.



This delightful event ended with dinner at the “Yacht Club of Greece” along the beautiful seaside of Microlimano, awarding one of our most valuable colleagues Mr. Dimitrios Poulianitis, as well as, Captain Georgios Karvelis, Captain Ioannis Kanellakis and Chief Engineer Ioannis Anthoulis.

The following day a sightseeing tour of our beautiful Piraeus and Athens was arranged for our colleagues from abroad. The tour was followed by a traditional lunch at a famous Greek restaurant in Plaka op-

posite the Acropolis.

We are happy and proud to have been part of an eventful Conference and we thank all the participants for their contribution and for sharing their ideas during this important Danaos team meeting.

We are looking forward to seeing you all next year!

Georgia Pastra

HR Assistant & Training Coordinator



Trying to “Vacuum” the Ocean

ARTICLE

In early September, a notice was received from the International Chamber of Shipping through the Greek Union of Shipowners, informing them about the installation of the first plastic waste collection system in the North Pacific area where the Great Pacific Garbage Patch (GPGP) is lying for the last decade. It also informed us about the dissemination of a related Notice to Mariners from the US National Geospatial-Intelligence Service which would alert the ships sailing in the area.

The GPGP -located halfway between Hawaii and California- is considered to be the biggest of the 5 ocean garbage patches which are areas where waste and mostly plastic are “trapped” with the assistance of the currents. These plastics find their way to the gyre through rivers with an estimated amount of 1.15 to 2.41 million tonnes each year that end up in the ocean. It should be noted that most of this plastic waste remains afloat and it is unlikely to leave the area until it degrades into smaller microplastics under the effects of the sun, waves and marine life.

The consequences of this process have been assessed to be very serious, not only for marine life but also for humans since these microplastics are becoming a part of the organisms’ diets, ending up in our plates through the food chain. The story can be even worse since according to a recent assessment of pollutants in plastics of the GPGP indicates that they may pose a chemical risk to organisms as 84% of the samples had at least one chemical exceeding sediment threshold effect levels.

The Ocean Cleanup and Wilson

The Ocean Cleanup (TOC) -founded in 2013 by the Dutchman Boyan Slat- is a non-profit organization with the mission of develop-

ing advanced technologies to free the world’s oceans from plastic on a large-scale and in an efficient and environmentally sound way. Its initial mission is the deployment of the System 001, with the code name Wilson, in the Great Pacific Garbage Patch in October 2018. The system, comprised of a 600-meter-long U-shaped floating barrier with a three-meter skirt, is designed to be propelled by wind and waves, allowing it to passively catch and concentrate plastic debris in front of it. The plan is that after collection, the plastic will be brought ashore for recycling.

Maritime safety issues

The design and concept of the system came after a long time of study and consultation with the maritime community providing strong support. In order to minimize the risk to shipping the North Pacific Gyre is not travelled across by major shipping lanes, with an average of three ships passing through each day. In addition, systems are fitted with several aids to navigation, including AIS and navigational lights, which make them traceable through GPS. If for example a collision takes place and system breaks, the GPS trackers will be able to locate the component parts so that they are collected and repaired. The system’s trajectory is forecast and broadcast, enabling ships to avoid collision. Marine support vessels are also on hand monitoring the system’s location and re-positioning it in case of need.

One month of operation

Boyan Slat said that during this time numerous observations were made regarding the behavior of the system and there is a need for some final fine-tuning before it can start harvesting plastic at its full potential. Namely,

the crew deployed to monitor the system’s behavior, and analyse data, found that for the most part, the system is behaving as predicted. Plastic density in the GPGP is in line with expectations; but, the data is limited and is yet to be fully verified as more time is needed to be spent in the GPGP for a broader perspective to be made. As informed, so far there have been no interactions observed with the marine life. However, the main concern at the moment is that plastic remains in the system for a relatively short time.

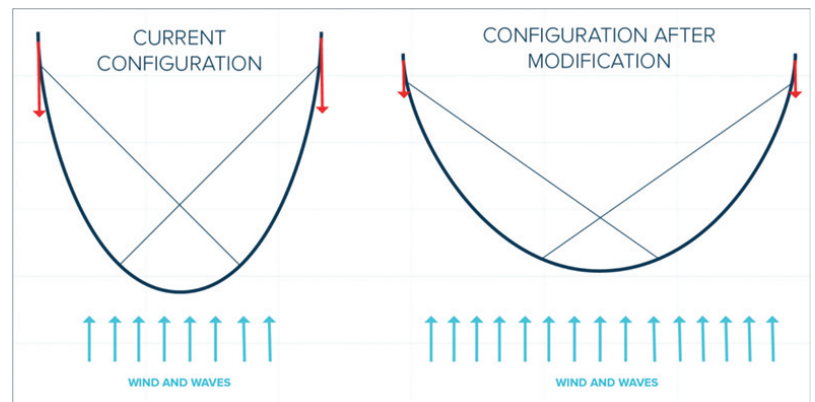
Slat further explained: “There could be various reasons why plastic is not staying inside the system. We have concluded that the system does appear to be moving too slow at times (remember, in order to catch the plastic, we need a speed difference where the system is faster than the plastic) or, occasionally, the speed difference appears to be reversed, where the plastic is then faster than the system. At the very minimum, the system needs to be continuously traveling faster than the plastic.” The solution investigated by Slat and his team is to address the speed difference by opening the U-shape about 60-70 meters wider. “Doing this should, theoretically, have two effects on the speed of the system; firstly, it will increase the surface area of the system exposed to the wind and waves, which are the driving forces of the system. Secondly, by widening the span, we think this could also reduce the propulsive force caused by the undulating ends, simply because it would not be directed straight into the motion direction of the system anymore,” he added.

Vassiliki Giannakou
SQE Coordinator

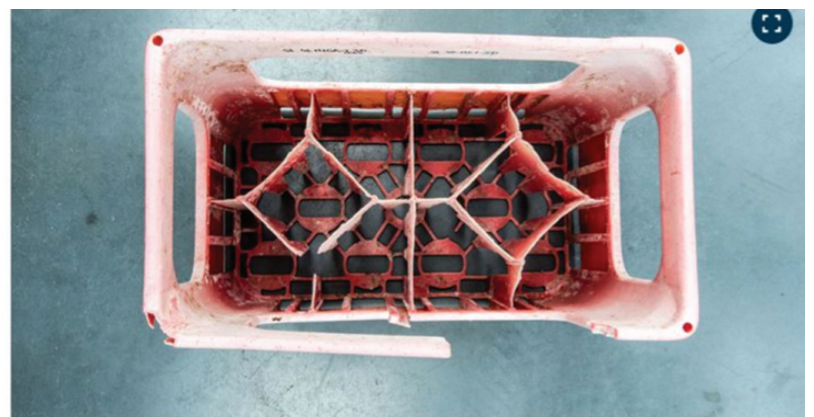
Reference: 1) <https://www.theoceancleanup.com/>
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3/3 #03 - This cover of a Nintendo Gameboy was produced in 1995
Source: The Ocean Cleanup



2/3 #02 - This hard hat dates back to 1989
Source: The Ocean Cleanup

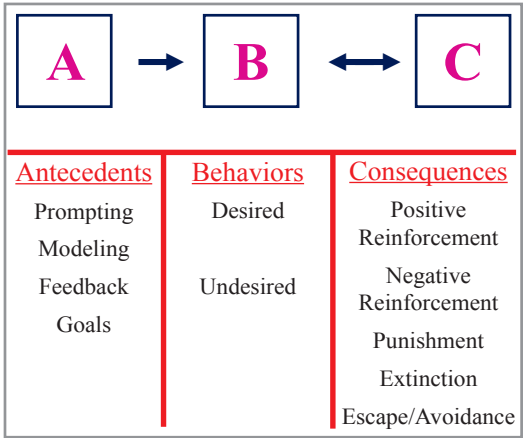


1/3 #01 - This crate found in the Great Pacific Garbage Patch was produced in 1977
Source: The Ocean Cleanup

A new approach to Safety

It is known that 75-80% of accidents are due to the human factor. Until now, we used to focus on traditional means of averting accidents such as safety meetings, regulations and committees or councils. But such early approaches to safety involve reacting to accidents and incidents ignoring their actual cause. So we need to look at new approaches to achieve safe and healthy workplaces. One of these could be the Behavior Based Safety (BBS) approach.

BBS tries to explain the motivation behind behaviors. More specifically, the above approach aims to understand the causes of incidents and near misses and correct them through the behavior of relevant people. It focuses on what people do, analyses why they do it and then suggests ways to improve the acts. In order to understand why people do what they do, we use the ABS model which consists of Antecedents, Behavior and Consequences and shows how these components interact with each other. Studying this model, we conclude that con-



sequences for current or past behaviors have the strongest influence on somebody's future behavior. A prerequisite for implementing the BBS system, is the development of a safety culture in an organization. This is related to the beliefs about behavior, a member within an organization holds. A positive safety culture could be achieved by ensuring positive reinforcement and feedback in all processes. The feedback from this will enhance the effects of the BBS program, and will add a sort of 'validity' in the eyes of the employees working safely.

But what exactly is BBS? BBS tries to provide a working environment that encourages workers to collaborate because they want to and not because they have to. For example, filling out checklists is a boring process for individuals on board. Reinforcing individuals in a positive way and providing feedback, through continuous observation, results in strong, durable behavior change, in addition to other new positive behaviors. On the other hand, providing negative reinforcement, the worker has no motivation to improve and so his performance decreases. So, if an employee is positively motivated, he/she will be more efficient and concentrated on what he/she has to do.

There are many advantages for a company when developing such a system and that's why more and more companies have already established the BBS system. Actually, the company obtains a reputation, as it sets high standards regarding safety issues. BBS includes employees enhancing their intention and performance in this way. So, they gradually increase their

hazard recognition and consequently the company comes to a safety improvement in all standards. Therefore, there are some barriers which an organization has to take into consideration when it decides to implement a BBS



system. More specifically, there is a resistance to change because of the culture of each company. In order to achieve it, a lot of initiatives have to be given to employees such as bonus, gifts or certificates.

In conclusion, BBS takes time to be implemented but results can be observed immediately due to the nature of measurement included. Last but not least, anyone who wants to implement this system has to remember that BBS is not a substitute for the already existing program but a supplementary tool which contributes to the creation of a total safety system.

Aikaterini Kontokosta
SQE Department Intern

Let's clean up the beach - The hunt for the lost...plastic

Another summer went by, with most of us enjoying the beautiful Greek beaches but feeling disappointed at the same time when seeing litter scattered across them-the majority of it being plastic! It is a fact that decades of plastic production have already caused environmental problems. Scientists are warning that there will be more waste in the ocean than fish by 2050, if the waste keeps flowing and the industry doesn't clean up its act. A crucial part of the solution is to choose the products we consume based on the way they are packaged. Another part is to contribute to the International

Coastal Cleanup Campaign-the largest voluntary event of its kind worldwide-where 13 million people have participated to date. On Sunday, October 7th, 2018, 50 employees from our Piraeus office and their families became part of Month of Action for the Marine Environment (15 September - 15 October 2018), coordinated by HELMEPA. We gathered in Glyfada, wore our cleaning gloves and started cleaning and monitoring our findings. The clean-up was followed by an educational visit to Archelon, the Sea Turtle Protection Society of Greece that protects sea turtles through

monitoring and research, habitat restoration, raising public awareness and rehabilitating injured turtles. Adults and children enjoyed the educational visit and left the South Coast beach feeling fulfilled, having assisted in protecting the environment. Although we all felt annoyed with those who clearly consider the sea a vast garbage receptacle, we still believe that there is hope if we all help address this global hazard with the hope of putting an end to it.

Tania Mermiga
Social Media & CSR Manager



2005 was the beginning of a new era for the international shipping industry. The International Maritime Organization (IMO) for the first time, introduced regulations about reducing Sulphur oxides (Sox) emissions from ships. Since then, these limits have been progressively tightened, leading to 2020 which will be a historical year, considering that Sox emissions will be reduced from 3.5% m/m to 0.5% m/m outside designated emission control areas (ECAs).

Outside an ECA established to limit Sox and particulate matter (PM) emissions	Inside ECA established to limit Sox and particulate matter (PM) emission
4.50 % m/m prior to 01/01/2012	1.50 % m/m prior 01/07/2010
3.50 % m/m on and after 01/01/2012	1.00 % m/m on and after 01/07/2010
0.50 % m/m on and after 01/01/2020	0.10 % m/m on and after 01/01/2015

But, why are these regulations so important?



Consider that in 2005 in the seas surrounding Europe, SOx emissions from international shipping were estimated at 1.7 million tons per year, NOx emissions at 2.8 tons per year and particulate matter (PM) at 195,000 tons. Eutrophication, formation of

ground-level ozone, acidification, corrosion-acidic substances, climate change and of course harmful human particulars are some of the problems caused by ship emissions. Limiting Sulphur oxides and exhaust gas emissions in general, reduces air pollution and results in a cleaner environment.

In order for ships to meet the lower Sulphur emission standards, the IMO suggests several solutions. The main idea is that exhaust gas emissions should be reduced. To do so, ship owners have to choose between operating with compliant fuels, using LNG or installing exhaust gas cleaners, known as scrubbers.



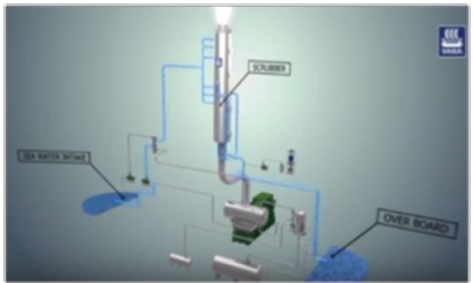
Using low-sulphur compliant fuel oil such as MDO, MGO and even methanol, seems like a good solution, as when ignited it leads to negligible Sulphur oxide emissions. It is also likely, that new blends of fuel oil for ships, will be developed during the next years, in order for a new low-sulphur fuel to be produced. These blends are more sensitive to storage, handling and compatibility, and may cause permanent damage to the main engine systems because of their lower viscosity.

LNG is low in Sulphur and easily combusted in engines and boilers, using mature and reliable technology. In general, LNG prices are lower than residual fuel prices, but due to lack of marine supply facilities, LNG may be more expensive than RFO once delivery costs are taken into account.



Converting existing ships to use alternative fuels such as LNG, is possible, but very expensive and technically challenging. A retrofit like that requires space for the installation of the fuel tank and containment systems, and engineering experience for gas zoning and engine conversion.

The use of exhaust gas cleaning systems, also known as scrubbers, is a commercially available option for the shipping industry. Ships installed with scrubbers, mean they can continue to burn high-sulphur fuel oil from 2020 and comply with the 0.5% sulphur limit. No changes will have to be made to the engines or fuel treatment plant, but the installation of a scrubber could be complex, especially for retrofits. There is a significant investment cost for the exhaust gas cleaning plant, and there will also be operational expenses related to increased power consumption, a need for chemical consumables and sludge handling. There are two technologies available today: dry and wet systems. Within the wet systems there are three alternatives: open loop, closed loop and a hybrid system that can operate either as a closed- or open loop system. The optimal scrubber type for a given ship depends on the machinery configuration, operational profile and the routes of the vessel. In addition, there are weight and space considerations that have to be taken into account, especially for retrofitting on existing vessels.



IMO's regulations may seem strict, but the environmental and human benefits from such actions are expected to be huge. The presented options are the most popular ones, but keep in mind that new ideas are born every day and new techniques are tested in order to find the best solution. Classification societies, developers, refineries, ship owners etc. are working together to accomplish a remarkable change in the shipping industry within the next few years.

Julia Karafera
Technical Department Intern

<http://www.imo.org/en/Pages/Default.aspx>
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Rotor Sails



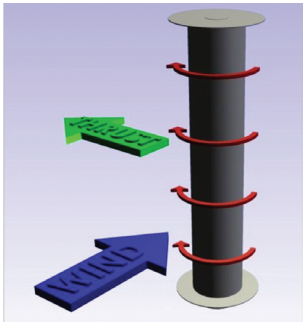
Two 30-meter tall rotor sails have been installed onboard the product carrier tanker "MAERSK Pelican" aiming to reduce fuel cost and associated emissions by up to 10%.

These rotor sails are large, cylindrical mechanical sails that spin to create a pressure differential

—called the Magnus effect that propels the vessel forward. The rotor sails will provide auxiliary wind propulsion to the vessel, optimizing efficiency by reducing fuel consumption and associated emissions by an expected 7 – 10% on typical global routes.

When wind conditions are favorable the main engines can be throttled back, saving fuel and cutting emissions, while maintaining speed and voyage time. The sails are made using light weight composite sand-

wich materials, which claim to ensure they remain well-balanced, thus offering a high tech, low-maintenance solution. The technology is projected to be particularly suitable for tankers and dry-bulk carriers (gearless) and this test will assist in determining the further potential for rotor sails in the product tanker industry. Presently, there are 3 vessels in daily commercial operation using rotor sails. Each of these cases represents a very different vessel type and operational profile, demonstrating the opportunity to harness the wind through rotor sails across the maritime industry.



Capt. George Kakouris
Senior Operations Manager

The Danaos running team participated in the 36th Athens Classic Marathon supporting ELEPAP

DANAOS NEWS

The Athens Marathon is like no other on Earth. According to legend, it covers the same ground that the Athenian messenger Pheidippides ran when he brought news of victory from the battlefield of Marathon 2,500 years ago. When you run the Athens Marathon, you run in the very footsteps of the ancient gods and heroes that gave birth to western civilization. The finish line is in Athens' magnificent Olympic Stadium, the birthplace of the modern Olympic

Games. Those who run the Athens Marathon say it is an experience they'll never forget. This year there was a grand total of 55,000 runners on Sunday during the 36th Authentic Marathon. This makes the event one of the biggest running events in the world. It is also one of the most well-known international races worldwide, since half of the runners participating in the marathon race come from outside Greece. Athletes

from more than 105 countries ran the tough original course. For another year, we would like to thank and congratulate the Danaos running team for being there and participating in the races, thus supporting ELEPAP and their important contribution to our society.

Georgia Pastra
HR Assistant & Training Coordinator



Leonardo Da Vinci

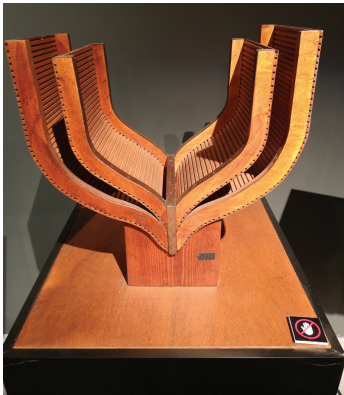
DANAOS EVENTS

On Sunday, December 9th, 2018 the employees of Danaos spent their morning discovering, learning and revealing the secrets of the Leonardo Da Vinci exhibition in the center of Athens. A new and impressive exhibition, 'Leonardo da Vinci – 500 Years of Genius' came to Athens, allowing visitors to explore the life and work of this great artist and inventor, 500 years after his death. Seventy five models of his inventions, natural reproductions, interactive machines and copies of his famous codes were on display, with more than 200 exhibits that have been designed in collaboration with the Leonardo da Vinci Museum in Rome. An emblematic building in central Athens was transformed into a complete presentation of Leonardo's work. Masterpieces, inventions, codices, and drawings from the Renaissance

master came to life, in an experience that was simultaneously enchanting, entertaining and educational. In the first part, we walked along the stunning exhibits, the remarkable paintings and the innovative designs of the mastermind Da Vinci for about an hour and a half. After that, the exhibition used experiential SENSORY4™ technology, a unique system that combined multichannel motion graphics, cinema quality surround sound and up to forty high-definition projectors to guide us through a unique journey in space and time to infiltrate the mind of the absolute "Homo Universalis" for forty minutes. At the end, there was a spacy room with the Secrets of the Mona Lisa that were revealed for the first time by Pascal Cotte and the Lumiere Technology Institute. It was indeed a very entertaining and educa-

tional visit to start your Sunday for both the grown-ups and the youngsters!

John Sapounadelis
HR & Training Trainee





Decorating the Danaos Christmas Tree

This year's Christmas tree was unique because it was decorated by us, all the employees of Danaos and the result was fantastic.

The idea for this year's Christmas tree was to decorate it with self-made knots along with Polaroid pictures captured from all the employees of Danaos. The result was very impressive and creative with knots of various types and pictures of all of us. This special season is a great opportunity for everyone to get together, stay united and feel the festive vibe.

HR & Training Department



Danaos goes to the theatre!

DANAOS EVENTS

In early November, the Danaos Piraeus employees came together for another theater night at the "Mikro Pallas" theatre in the center of Athens.

The author of the comedy "Art" Yasmina Reza is a famous French dramatist, novelist, director and actress best known for her brief satiric plays that speak to contemporary middle-class anxieties.

The play has been translated in Greek by Stamatias Fasoulis and directed by Theodore Atheridis, who is also one of the leading actors.

The three leading actors, Theodore Atheridis, Alkis Kourkoulos & George Pырpasopoulos offered a great performance to the audience.

The play is about a painting, extremely ab-

stract -white & spotless- which will cause their friendship to be tested for good. The choice of one of the three friends (Atheridis), to spend an exorbitant amount of money in order to buy this painting, will result in a general crisis affecting his relationship with his two friends. All the "certainties" and the typical behaviors shaped within the years between the three friends will be reviewed.

And they will wonder: Can art make a fool out of us?

Does freedom of expression work as an asylum for charlatans, post-modern artists who do not create art but only brag and chat?

What does it mean "this work speaks to me"?

And if someone is lying, who is that? Creator

or recipient? Or both? Or nobody?

Is it our fault that we do not recognize the value of a "work of art"?

How can we be friends when one dares to invest enormous amounts in a project that the other thinks as "garbage"?

Differences in the aesthetic perception of people can be fundamental at times, but through friendship and understanding they can be resolved.

We hope that everyone enjoyed the play and that we will meet again soon for another enjoyable evening!!!

Katerina A. Vassilopoulou
HR & Training Trainer



"Act of Joy - Christmas 2018"

The Christmas Spirit is all around us and thinking proactively for those in need is of vital importance.

This year the employees of Danaos offered groceries, cleaning and hygiene products to the Hellenic Association "Sullogos Paidi kai Dhmiourgia", a non-governmental, non-profit organization which supports 86 families (with economic and social difficulties of children with special needs).

We also supported the Social Care Unit "Anarrwthrio Pentelhs" which hosts 55 abandoned kids (infants up to 4 years old).

With Christmas being the most festive time of the year, it is a good opportunity to sit back for a moment, appreciate what we have and think about the people around us who have needs that we consider as given.

It only takes a moment to put a smile on someone's face!

John Sapounadelis
HR & Training Trainee



Skiing and its Benefits

ARTICLE

Winter is here and even though the days are getting shorter and the weather is not really ideal for exercising, there is a sport that covers the winter exercise deficit - skiing. Not only is it fun and exciting, it also has wonderful physiological and psychological benefits.

First let's look at some of the physiological benefits.

1. Skiing strengthens your cardio vascular system. Undoubtedly skiing is an aerobic activity. Cross-country skiing in particular is a high endurance style of skiing. Downhill skiing both on, and off-piste is also an aerobic sport.

2. Skiing improves body balance and core strength. Balance is key, when skiing, therefore all the core muscles strengthen while skiing. In time, your balance will be improved tremendously.

3. Upper and Lower Body strength. Downhill skiing requires constant leg motion, and squatting. Cross-country skiing on the other hand requires the use of upper body muscles as well, to create momentum when moving forward.

4. Improved range of motions. The constant effort to move on mountain slopes with an ever changing surface, forces the body to become more flexible and forgiving in terrain changes.

5. Loss of weight and gain of vitamin D. Burning an average of 3000 calories in a day of skiing is not that bad, considering how much fun skiing is. Also the body absorbs much needed

vitamin D through sunlight. A vitamin much needed during winter months. At this point, I would advise the use of sunscreen on sunny days to avoid sunburn. Mountain sun can be very strong especially when it is being reflected on the white snow.

Now some the psychological benefits.

1. Skiing makes you happy. Studies have shown that skiing creates positive emotions to people who practice it. The serenity of the mountainous terrain, combined with the fresh air, makes people feel that they are part of a bigger picture. Thus, a sense of appreciation outshines daily routine worries.

2. Enhances the senses, especially awareness and concentration. The mind becomes more aware of the body's position, and the next moves needed when skiing down the slopes at speed. Therefore the brain's ability to calculate and analyze the surroundings is enhanced

3. Perseverance and dedication. Skiing requires effort and dedication. If you fall, get up and try again. The constant effort and persistence will turn into achievement and self-confidence. This is one of the most important mental benefits of skiing, especially for young skiers. It teaches them not to give up.

It does not matter if you visit France's, Courchevel with the largest linked ski area in the world, or Russia's quiet slopes of Bukovel, or the well-

groomed slopes of Rosa Khutor Ukraine, or even the shot pistes or Parnassos Greece, and Zaavour Lebanon. You'll be amazed to find that Skiing is an amazing sport with wonderful benefits. It is tough and exhausting but equally motivating and inspiring. Whether you are young or old, fit or trying to get fit, there's no better time to hit the slopes. What is important to remember is that, if you fall, get up and try again.

Kostas Giotis

Operations and Financial Analyst

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The joy of Christmas and its decorations

ARTICLE



Many believe that Christmas is the most wonderful time of the year. It brings out warm feelings to almost every human being, where the beautiful decorations and festivities have the power to persuade even the sceptics, to express their more optimistic version of character!

Why do we feel this way during Christmas though?

The answer to this question is quite simple and can perhaps even be scientifically justified.

According to researches, decorating for Christmas has a positive effect on human psychology, making individuals more optimistic during the Christmas Holiday, compared to the rest of the year.

By observing the Christmas decorations, individuals tend to set aside their usual daily concerns and worries, allowing themselves to feel free and enjoy the glow of the celebration. They are also more willing to share with others.

If we think of the impact Christmas decorations have on our psychology, we will discover that it is directly linked to our childhood. Specifically, we unconsciously return to the decorated house of our childhood, where everything looked simpler, calmer and safer. The only "problem" for us back then was whether or not we would like our presents, the Christmas delicacies or mums Christmas preparations and gatherings with friends and family.

During these difficult times over the last years of economic and political crisis, Christmas decorations are a great opportunity to fill our lives with

happiness and optimism. This is probably why we want to buy every beautiful ornament we see!

What is of a great interest to note, is how Christmas decorations alter an employee's mood in the working environment. Employees and employers tend to change their behavior to the better by becoming more patient, thus being more effective.

Decorating the company Christmas tree, has the power to create stronger relationships and bonds, even encourage friendships.

A beautiful Christmas tree with colorful Christmas baubles or a decorated Ship with lights. A row of stars and bells decorating the streets of the city, can work wonders on human psychology.

However, we should not fail to mention the pessimists, who will find these decorations superfluous and perhaps as an opportunity for extra money spending. I would like to urge them to see everything more positively and embrace the Christmas Spirit, encouraging them to feel like children again.

These holy days have an unexplained power over people. Don't forget the well-known story of 'Scrooge', making me wonder why people are willing to change only during Christmas becoming more generous and optimistic?

If Christmas decorations are the key factor to triggering these feelings, then maybe we should keep them for the rest of the year. However, it might be better for humanity to try and find different ways to be happier, because happiness and generosity are not products which have an expiration date. Happiness and optimism are values of our everyday life and generosity is a key in order for happiness to be revealed.

Katerina Nika

Assistant Accountant

We need you!

Please feel free to send us new ideas as well as articles and photos you might find interesting.

Mail to: hr@danaos.com, with subject: "For the Danship News."

Season's Greetings!

We hope this holiday adds more happiness to your life.

danaos



Ετήσια Στήριξη για το παιδί με αναπηρία

As for us at Danaos, for yet another year we choose to reinforce the ELEPAP Foundation's efforts to protect and rehabilitate disabled children. We pray you follow the same path.