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Technical surveys on engine room department - bunker ships

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ABSTRACT

The merchant marine of our days evolves at a dizzying pace, having to update its regulations to the new provisions that apply internationally the laws, mainly of the International Maritime Organization (IMO). The safety, protection, environmental impact and life on board is firmly regulated. The shipping companies must compete every day to excel in a varied and demanding market, having to look for a tool that guarantees their benefits in the interests of the public administrations, the country in which it operates, the country that registers it, and course before your clients.

1. Introduction.

The merchant marine of our days evolves at a dizzying rate, having to update its regulations to the new provisions that apply internationally laws, mainly from the International Maritime Organization (IMO). The safety, protection, environmental impact and life on board is regulated firmly. Shipping companies must compete every day to excel in a varied and demanding market, having to look for a tool that guarantees its benefits facing the interests of the public administrations, of the country in which It operates, from the country that registers it, and of course before its clients. Inspections fulfill a vital function: Demonstrate in an approved way the due compliance with standards and obligations by ships before the party interested.

During the present work we analyze in depth the effect of this range of requirements in tankers, both oil tankers and chemical tankers of GRT and draft means of the Spanish merchant marine, operating in foreign or national ports.

We focus on the machinery department, where the demand from the inspectors, whether internal, from the shipping company itself, or external, classification, public administrations and vetting of customers, tests the professionalism and preparation of its staff. The fundamental objective is to study the evaluations that the different organisms that we will also define constantly carry out on board, evaluating their importance and impact on the fleet.

This responds to a need to be clear about our responsibility in the positions of officers of Machines on board, since ultimately it will fall on them to attend to the requirements to which the department is subjected by the inspectors. To carry out the aforementioned general objective, we have proposed to achieve it on the basis of four specific objectives.

1. Review the certificates required by the ship itself to navigate, focusing on the Machinery Department, its effective period of validity and time for their renewal, as well as the regulations that regulate them at the international.
2. Differentiate between the types of inspection to which we may be subjected and in which cases, depending on the type of ship and the base port of operation
3. Analyze the chosen model ships, describing the differences and similarities most important among them.
4. Know the functions and responsibilities developed by an Officer of Machines in technical inspections to your department.

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1.1. Applicable regulations.

As we pointed out previously, the rules that regulate the sector are updated constantly in tune with the technical evolution of ship systems and equipment modern. Below we list the most relevant in terms of inspection:

- ROYAL DECREE 1837/2000, OF NOVEMBER 10, BY WHICH THE INSPECTION AND CERTIFICATION REGULATION OF CIVIL VESSELS.
- AMENDMENTS TO THE ANNEX OF THE PROTOCOL OF 1978 RELATING TO THE CONVENTION INTERNATIONAL FOR THE PREVENTION OF POLLUTION FROM SHIPS, 1973.
- UNE-EN ISO 19011, GUIDELINES FOR THE AUDIT OF SYSTEMS OF QUALITY AND / OR ENVIRONMENTAL MANAGEMENT
- INTERNATIONAL DANGEROUS GOODS CODE (IMDG CODE). RULES FOR THE SAFE TRANSPORTATION OF DANGEROUS GOODS IN PACKAGES BY SEA.
- DIRECTIVE 93/75 OF THE EU. RULES ON NOTIFICATION FOR SHIPS THAT TRANSPORT DANGEROUS GOODS AND ENTER THE PORT COMMUNITY
- RESOLUTION 481 OF THE XII ASSEMBLY OF THE MARITIME ORGANIZATION INTERNATIONAL (IMO Res. 481 XII). RECOMMENDATIONS ON ASSIGNMENT OF MINIMUM-SECURITY CREW.
- AGREEMENT TO PREVENT POLLUTION BY SHIPS (MARPOL 73/78). RULES TO AVOID SUBSTANCE DISCHARGES OPERATIONAL AND ACCIDENTAL POLLUTANTS FROM SHIPS.
- AGREEMENT ON COOPERATION, PREPAREDNESS AND FIGHT AGAINST HYDROCARBON POLLUTION (OPRC 90). COOPERATION INTERNATIONAL, NOTIFICATION AND PREPAREDNESS AND FIGHT PLANS AGAINST POLLUTION.
- CONVENTION ON MARITIME LABOR, 2006
- ORDER 14.7.64. WHY THE MINIMUM CREW IS ESTABLISHED WHAT MERCHANT AND FISHING VESSELS MUST CARRY
- R.D. 438/94. REGULATES WASTE RECEPTION FACILITIES OILS FROM SHIPS
- ROYAL DECREE 2662/1998, OF DECEMBER 11, on rules and standards common for ship inspection and control organizations and for corresponding activities of the maritime administrations.
- INTERNATIONAL SECURITY MANAGEMENT CODE (ISM CODE)
- INTERNATIONAL CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS THAT TRANSPORT HAZARDOUS CHEMICALS IN BULK.
- INTERNATIONAL CONVENTION ON CIVIL LIABILITY BORN FROM DAMAGE DUE TO HYDROCARBON POLLUTION, 1969, AMENDED BY THE 1992 PROTOCOL (ARTICLE 7)

Figure 1: IMO Logo.

Source: www.imo.org s.f.

1.2. Ship certificates.

Certificates are documents issued that certify that an activity inspected complies with the aforementioned regulations. The set of certificates from the Spanish Administration in this case and from the Sociedad de Classification must always be up to date, with the competent official being the in charge of signing and stamping when successfully passing an annual, intermediate or Newspaper.

It may also be the case that the Administration delegates to an entity authorized collaborator to also carry out control activities. The captain, who is responsible for their control and filing, has them on file.

They should always be available on board for examination, and they should all be in rule before going sailing. In relation to maintenance inspections, the captain must inform said department in case of any renewal of the themselves, with a date before their expiration to plan it. The captain must seek in accordance with the company's SGI carry out a chronological numbered control of all certificates for the life of the boat. The certificates that the Administration certifies are up-to-date and in order to board are as follows:

- TOC: ship's navigability document. If the captaincy inspection ship observes any deficiency on board can remove it, without which the ship will not be able to leave port until the fault has been solved.
- Certificate of tonnage.

- International Freeboard Certificate.
- Safety Certificate for cargo ship in this case, although it varies depending on the type of ship
- Radio safety certificate.
- Certificate of machine without permanent endowment UMS, which have the three model ships.
- International Certificate for the Prevention of Pollution by Hydrocarbons (IOPP) on contamination. Covers the hydrocarbon book (competition direct from the chief engineer), the tanks and their contents, the bilges etc. It indicates the type of bilge separator, 15 ppm with automatic stop and alarm device, and approval thereof; the type of vessel, in this case oil for petroleum products; tanks of separate ballast; ground connection for the discharge of waste from the bilges from the machine to the reception facilities; double hull; Exit ballast water above the waterline; emergency plan by oil pollution.
- International Dirty Water Pollution Prevention Certificate ISPP, Certificate of exemption from the obligation to wear survival suits for the total number of authorized persons on board; this certificate assesses according to ship and its route that it is not necessary to carry one per cabin in case the navigation takes place near the coast.
- Certificate of recognition of life rafts.
- Certificate of recognition of means of loading and unloading.
- AMOS Maintenance System Certificate, this for example never expires, as long as the equipment does not change it will be valid.
- International Air Pollution Prevention Certificate for engines, issued on the auxiliary engines of the ship.
- Ship Protection Certificate.
- IAPP (International Air Pollution Prevention) certificate.
- ISPP certificate: contamination by dirty water.
- IAFS certificate (paintings). [eleven]

Figure 2: Ship's bridge.

Source: Authors.

Apart from these certificates, the ship must complete before the inspectors:

Figure 3: International Ship Protection Certificate.

ESPAÑA
Spain

Ministerio de Fomento
Dirección General de la Marina Mercante

CERTIFICADO INTERNACIONAL DE PROTECCIÓN DEL BUQUE
INTERNATIONAL SHIP SECURITY CERTIFICATE

Nº del Certificado 271117/4
(Certificate Number)

Expedido en virtud de las disposiciones del
Issued under the provisions of the
CÓDIGO INTERNACIONAL PARA LA PROTECCIÓN DE LOS BUQUES Y
INTERNATIONAL CODE FOR THE SECURITY OF SHIPS AND
DE LAS INSTALACIONES PORTUARIAS (CÓDIGO PBIP)
OF PORT FACILITIES (ISPS CODE)

Las fechas deberán consignarse según el formato: dd/mm/aaaa
(Dates should be in the format dd/mm/yyyy.)
Bajo la autoridad del Gobierno de ESPAÑA
Under the authority of the Government of

por Dirección General de la Marina Mercante
by

Nombre del buque: MENCEY
Name of ship
Señal distintiva: EAPV
Distinctive number or letters
Puerto de matrícula: SANTA CRUZ DE TENERIFE
Port of registry
Tipo de buque: TANQUE DE PRODUCTOS
Type of ship PRODUCT TANKER
Arqueo bruto: 4599
Gross tonnage
Número IMO: 9280146
IMO number
Nombre y dirección de la compañía: DISTRIBUIDORA MARITIMA PETROGAS S.L.U.-C/ FOMENTO, Nº 7 - 2º PISO-OFICINA 6 (38003-SANTA CRUZ DE TENERIFE)
Name and address of the Company
Número IMO de la Compañía: 1915562
Company IMO number

SE CERTIFICA:
THIS IS TO CERTIFY:

1. Que el sistema de protección del buque y todo equipo de protección conexo han sido objeto de verificación de conformidad con la sección 19.1 de la parte A del Código PBIP;
That the security system and any associated security equipment of the ship has been verified in accordance with section 19.1 of part A of the ISPS Code;
2. Que la verificación ha demostrado que el sistema de protección del buque y todo equipo de protección conexo son satisfactorios en todos los sentidos y que el buque cumple las prescripciones aplicables del capítulo XI-2 del Convenio y de la parte A del Código PBIP;
That the verification showed that the security system and any associated security equipment of the ship is in all respects satisfactory and that the ship complies with the applicable requirements of chapter XI-2 of the Convention and part A of the ISPS Code;
3. Que el buque cuenta con un plan de protección del buque aprobado.
That the ship is provided with an approved Ship Security Plan.

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Source: Example model from ship.

- Resolution of minimum provision of security crew.
- Titles, qualifications and training of the people on board.
- Hydrocarbon record book.
- Emergency plan on board in case of hydrocarbon contamination.
- Waste management plan and record book.
- Hours of work and rest of workers.

1.3. Types of inspections.

a) INTERNAL AUDIT Internal audits are carried out by companies to check that on board of the ships in the fleet meet, among others, the requirements of the Management System Integrated, in terms of safety, quality, maintenance and SOPEP. The Department In charge of this function according to the organization chart seen above is the Department of Safety and Environment. This department is responsible for evaluating and making decisions regarding the safety, health, environmental protection and quality of the ships in the fleet, as well as how to guarantee that all the certificates that must be kept up-to-date carry-on board, and night and standing orders and policies are adhered to. They are in permanent contact with the crew by

phone or email. They are in charge of supervising that the established points are adequately followed in the Integrated Management System of the company, hours of work and rest of the personnel, work permits (cold, at height, electrical, etc.), hours of rest, good condition and operation of the bilge separator unit, tests carried out and other documents and verifications.

b) MAINTENANCE INSPECTIONS The maintenance department, generally made up of heads of machinery and naval engineers, supervises and supports the personnel on board, through inspections at appropriate intervals, investigation of possible failures or breakdowns, recommendations to the crew, as well as managing the record of all activities related to maintenance and purchases made of both consumables and spare parts. It is also in charge of investigating possible deficiencies detected, as well as report them with an alleged cause. They are also responsible for enhancing awareness safety on board in all workers, and train as necessary in matter of identifying hazards and assessing risks.

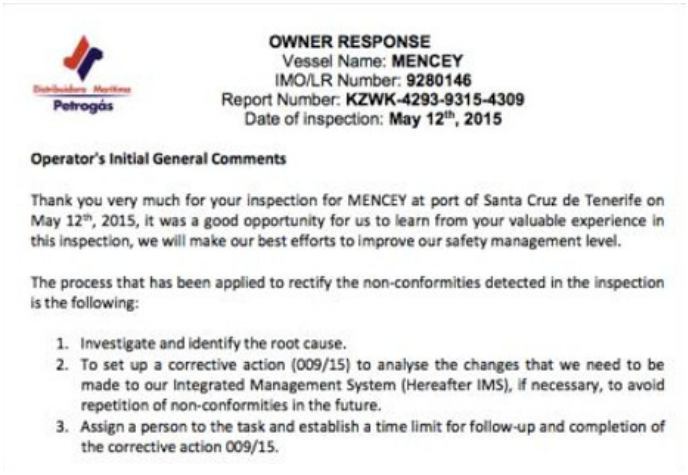
c) SEA CAPTAINCY The National Administration is mainly in charge of the following functions, through the Maritime Captaincies distributed throughout the state and dependent of the Ministry of Development. These are mandatory inspections for all flagged ship in our country, and will also be in charge of making revisions of safety for ships operating in our waters.

d) PORT STATE CONTROL The mobility and versatility of modern ships exponentially expands the scope of operation of shipping companies around the world, finding us cases of vessels operating one season in a country, and when changing, for example, the freight you contract the shipowner has to move its base port from operations. In addition, the nationality of the shipping company does not always correspond to the scope of performance of your fleet.

e) CLASSIFYING COMPANY Classification societies historically arose out of the need for insurers of a pre-signature guarantee, mainly the structural condition hull and machinery. Instead of recognizing all teams at one time In particular, continuous recognition is used over a 5-year cycle due to the impossibility of keeping a ship inoperative for an interval of days such that it allows inspect all your machinery. Classification Societies are interested in promoting non-governmentally safety, stability and environmental protection on board navy ships merchant. In order to evaluate these boats, they employ technical inspectors homologated all over the world, such as certified Class inspectors.

f) VETTING In this type of inspection, it is the case, for example, of a private company, dedicated to the production of petroleum products, in charge of chartering ships from shipping companies to distribute the product. The charterer of course wants to guarantee the maximum quality and efficiency in the vessels it charter, so opponents interested in assume such distribution must meet the freight requirements. For this, the company hires the services of an inspection designated by the charterer, and if it is the case of overcoming it satisfactorily, it will remain in their credit the fact of being suitable for transport, in guaranteeing a final contract, but without a doubt it is a requirement for her.

Figure 4: BP report presentation.



Petrogás

OWNER RESPONSE
Vessel Name: **MENCEY**
IMO/LR Number: **9280146**
Report Number: **KZWK-4293-9315-4309**
Date of inspection: **May 12th, 2015**

Operator's Initial General Comments

Thank you very much for your inspection for MENCEY at port of Santa Cruz de Tenerife on May 12th, 2015, it was a good opportunity for us to learn from your valuable experience in this inspection, we will make our best efforts to improve our safety management level.

The process that has been applied to rectify the non-conformities detected in the inspection is the following:

1. Investigate and identify the root cause.
2. To set up a corrective action {009/15} to analyse the changes that we need to be made to our Integrated Management System (Hereafter IMS), if necessary, to avoid repetition of non-conformities in the future.
3. Assign a person to the task and establish a time limit for follow-up and completion of the corrective action 009/15.

Source: Example model from ship.

2. Material and Methods.

2.1. Material.

In this section we will present the scenarios in which the results of the present work. In this case they are: B / Q NIVARIA, B / T MENCEY and B / T HESPERIDES, which belong to the company Distribuidora Marítima Petrogas, dedicated to the maritime transport of petroleum products.

Figure 5: Part of Petrogas fleet.

Source: Authors.

Despite having said Spanish flag vessels, and being registered in the port of Santa Cruz de Tenerife, not all operate with this port as a base. The first of them, the Nivaria, is chartered by the Portuguese company GALP, dedicating itself to the consumption and transport of products in Portugal, with a base port in Sines and routes to Madeira, Lisbon or Leixoes. Likewise, ships are consumed of great displacement, such as cruise ships, oil tankers, bulcarriers or containers.

The ships Mencey and Hespérides operate between the Canary Islands, transporting products such as ATK, Diesel, Gasoline or asphalt among them, with a base port in Santa Cruz of Tenerife.

a) B/T NIVARIA

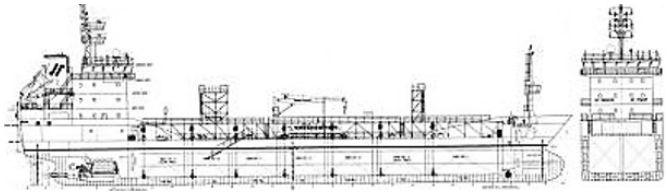
Despite the fact that all three vessels are listed as tankers, only the Nivaria ship has all the conditions for the transport of chemical products (CHEMICAL TANKER IMO II), including the entire installation of product lines from stainless steel cover, thus you can transport products that are not must mix with each other in various tanks.

Projecting began in 2003 at the RMK shipyards in Turkey, and the September 6, 2004. He is currently chartered by the company Portuguese oil company GALP and the agreed freight includes consumer service to ships of all kinds in waters Portuguese, providing service in solids loading terminals to bulk, containers or products derived from Petroleum. Therefore, the own GALP company is the main in charge of carrying out Vetting assessments on board.

Figure 6: Nivaria's bunkering.

Source: Authors.

Figure 7: General Arrangement B/T Nivaria.



Source: Ship plans.

b) B/T MENCEY

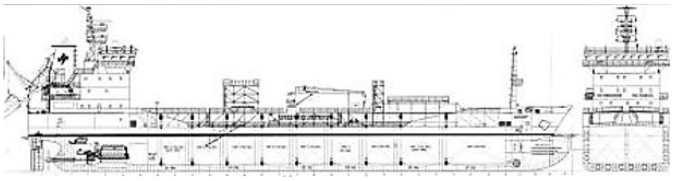
The Mencey Ship is the second that we will study in this work; It?s about boat with the highest propulsion power of the three mentioned above (5523 HP at 600 r.pm). It is built, like the Nivaria, in the RMK shipyards of Turkey in the year 2004 Unlike the other two model ships, this one is evaluated by the Classification Society Korean Register of Shipping.

On the other hand, the company CEPSA, that supplies the product it distributes, is in charge of the Vetting certificates that You must renew the boat through inspections.

Figure 8: B/T Mencey.

Source: Authors.

Figure 9: General Arrangement B/T Mencey.



Source: Ship plans.

The ship's base port is Santa Cruz de Tenerife, from where it is in charge mainly to distribute products such as IFO 180, Gasolines, Diesel or ATK to the ports of the remaining islands: San Sebastián de la Gomera, La Estaca (El Hierro), Santa Cruz de La Palma, La Luz and Salinetas (Gran Canaria), Arrecife (Lanzarote) and Puerto del Rosario (Fuerteventura).

c) B/T HESPERIDES The third model ship that we will study is the one that has been in service the longest, since 1996 when it was delivered, and it is also the one with the highest load capacity has. Its IMO number is 9140853 and it also has a Spanish flag, registered in Santa Cruz of Tenerife.

The arrangement of their tanks is distributed in such way that destined 8 tanks to clean products, 6 to products dirty and 4 bottles asphalt. Has also double helmet along all its structure mas a measure of protection and security.

Unlike the previous ones, the ship was built in the Valencia shipyard, Spain. Its freight and route are very similar to the B/T Mencey, distributing products derivatives of petroleum between the Canary Islands and occasionally the south of the peninsula, with a majority of trips between Santa Cruz de Tenerife, its base port and the islands eastern Gran Canaria, Fuerteventura and Lanzarote.

CEPSA is primarily responsible for its Vetting inspections, but it is also responsible for You may see others submitted, such as BP this year.

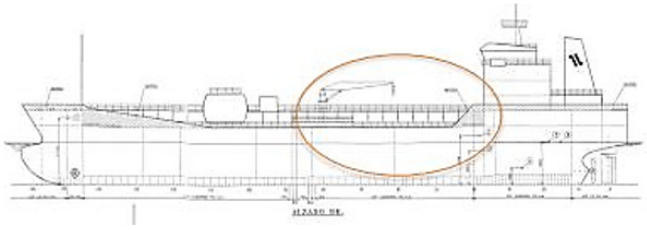
2.2. Methods.

Always the previous days represent a challenge by joining forces with the entire crew to fine-tune the equipment, spaces and systems, in order to make the best possible impression on their status, as well as training ourselves on the procedures to be carried out in situ with the inspectors.

Figure 10: B/T Hespérides.

Source: Authors.

Figure 11: General Arrangement B/T Hespérides.



Source: Ship plans.

All important documents of the SGI must also be reviewed, the disassembly, photographs and work order of the equipment that passes reconnaissance and be disassembled for visual inspection at the extent possible.

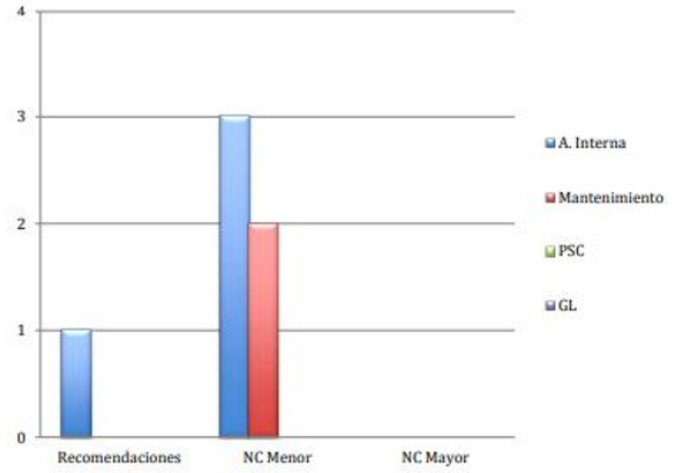
3. Results.

We are going to carry out a comparative study between the technical inspections carried out on the three model ships. To do this, we base ourselves on the results that the auditors have reflected in their reports end to the company, in the typology of observations indicated, namely:

- Recommendations
- Minor nonconformity
- Major non-conformity

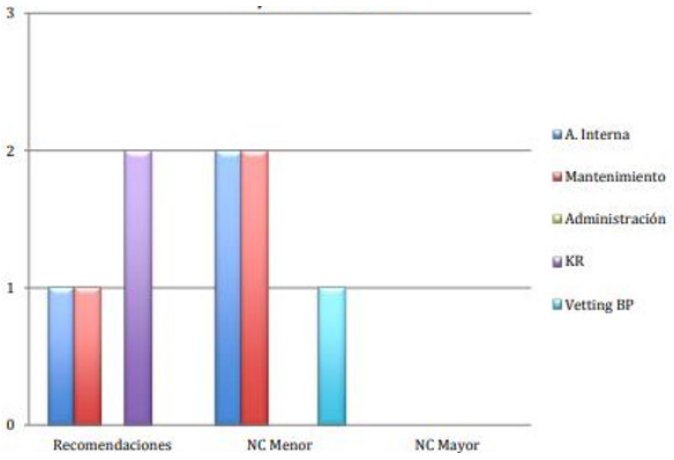
Four inspections take place on the ship Nivaria. In the internal audit, a recommendation and three minor non-conformities, and by the inspection of maintenance two minor nonconformities. It can be considered a trait of deficiency of the management system by the department staff, who are deal with and close within the week following the verdict of the inspection. However, the Port State Control approves your evaluation, without any annotation at all, the ship being the only Spanish in international waters that achieves this result.

Figure 12: B/T Nivaria chart.



Source: Authors.

Figure 13: B/T Mencey chart.



Source: Authors.

Also, during the continuous recognition of the DNV-GL classification society all and each of the teams to be recognized passes the inspector's approval.

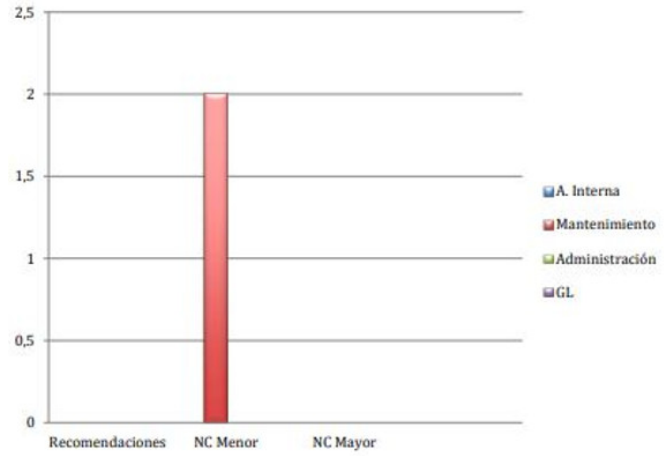
In the case of the second vessel, the Mencey is the one with the most types and number of inspections will study. Like Nivaria, it receives Internal Audit and Inspection of the Security and Maintenance departments respectively.

The first issues a recommendation and one such minor nonconformity, and the second one recommendation and two nonconformities.

On the other hand, it passes with the Maritime Captaincy and the Classification Society the Annual Survey Report, the annual inspection, in which the first of them is solved without any annotation. The CEO of the class does make two recommendations at the end of his department evaluation.

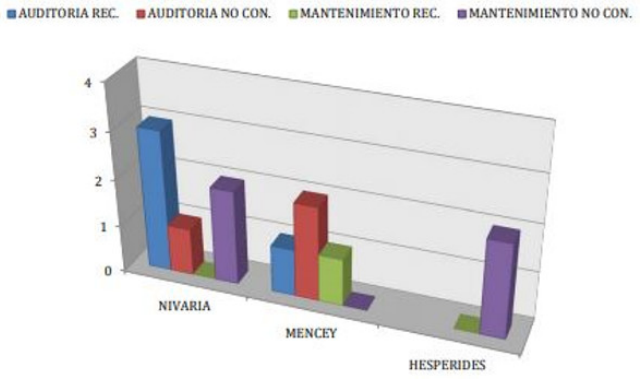
The B/T Hespérides ship presents more favorable data compared to the previous ones, although it is the one that passes the least inspections. Instead, we study a crucial process for the life of the boat such as its Landing and its recognition continuous

Figure 14: B/T Hespérides chart.



Source: Authors.

Figure 15: Comparison of results.



Source: Authors.

special and renewal of the class.

At the end of its grounding, the ship is afloat with all its renewed certificates, hull and recognized structure, as well as all the machinery for reconnaissance that was missing to complete a 100% on-board cycle by both the Captaincy Inspector Maritime as the DNV- Germanischer Lloyd´s Classification Society.

In this graph we can see the large number of inspections it undergoes the company to its fleet, and the high degree of demand for it. In this case the B/T Nivaria is the one with the most types of annotations by both Security and Maintenance, being the T / T Hespérides the least, with the observation of that we do not include in our results an Internal Audit carried out in said vessel.

In total, there are more non-conformities than recommendations, but nevertheless, at no time do they find deficiencies of such magnitude that they report no serious conformities in none of the cases, a fact that shows the concern of the personnel on board for adequately carrying out all that is established in the maintenance and security company.

Conclusions.

Observing the results obtained and the final comparison, we have reached several conclusions:

1. After analyzing the results obtained, we see that the procedures of the shipping company internally and the cadence and frequency of its audits and maintenance inspections, favorably assist the crew and the prepare for third party inspections.

2. We consider the planning of the calendar by both of us to be ideal. Audit Departments, since an inspection inspector is always on board. the Company on previous dates of external inspections, being able to through recommendations, detect and solve deficiencies that are not impact on non-conformities in external reports of Administrations, Classification Societies, and for clients who contract the services of the shipping company to distribute your product.

3. Taking into account the results obtained and the different evaluations that we do the on-board inspections, we can consider a series of improvements in the way of dealing with them. We consider that one of the tools that can best help a crew cope with evaluations of this type is the training and familiarization of the same with the equipment that drive. After studying different marine facilities, we see that it is true that there are similarities between them, but also many differences. A permanent crew, mainly in positions that deal directly with the inspectors (Chief and Engineer Officers, Captain and Bridge Officers), and used to operating with the same equipment, knowing its defects, redesigns that may have suffered during their useful life would improve the results of the reports, and the resolution of deficiencies found.

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