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Opinion Article

Ship Project and Ship Safety

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Safety on ships has always been a very important problem in the history of mankind. It is so important that, even nowadays, the names associated with the main naval disasters are not only related to the names of some famous ships, but have become terms of common use to indicate disasters, such as 'Titanic' and 'Exxon Valdez' and have even inspired works of art such as "The raft of the Meduse" by Théodore Géricault exhibited at the Louvre Museum.

Nowadays this theme is getting more and more important as we are witnessing a rapid growth in the sizes of the ships. In few years the 'Passenger ships' have overcome 340 m in length and got 5000 people on board, such as the 'Seaview class of MSC' or the 'Oasis class of Royal Caribbean'; the 'Container carriers' have exceeded 18000 TEUs, such as the 'Maersk Triple E' and the 'Carrier LNGs', over 300 m in length.

This very rapid growth in size explains why we can never stop and we cannot think that sufficient levels of safety have been achieved. Moreover, as soon as a new legislation is issued by the competent authorities, namely the IMO and various Governments, immediately the industry and the commercial world make it necessary to think of something bigger with new technological challenges. That's why the importance of this Journal becomes clear: the need to inform the Scientific Community about the new developments in the Engineering world with their repercussions on the problem of Safety.

So far we have been dealing with the problem of safety in its immediate meaning of safeguarding life: there are examples of recent regulations, such as the EU's "Inland waters" regulation, or the various LY3 LY4 as for Yachts, or the regulations for "Passenger Yachts" which apply extremely strict criteria, studied for Passengers ships, to inland waters Passenger ships or to Superyachts. Nowadays it is very important to carefully examine the wider meaning of the word "safety".

In the modern world, in fact, we are projected towards the Future and we think in a global way: that's why the word "Safety" takes on a wider and more complex meaning: "Safety" does not just mean only "saving a life" in the exact instant of an accident, but also means to be always able to guarantee an excellent quality of life on board. So the concept of "Safety" expands and not only includes ergonomics, but also the protection of health on board and includes environmental protection both in a direct way, in order to prevent accidents that could cause immense ecological damage, but also in an indirect and not less important way, by thinking about the future, about recycling and disposal.

Industrial engineering is therefore the tool to pursue the aim of this increasing in safety from a global point of view. A ship is a global system, her design includes different elements that must be harmonized: the construction of the hull, the propulsion system, the systems, the control systems, all these elements must be designed harmoniously in order to guarantee safety, propulsion and systems. Industrial engineering includes mechanical, chemical and electronic engineering, so it can be safely said that, in the naval field, we can talk about the link between industrial engineering and safety even when we deal with new antifouling paints for the hulls, which must not be toxic to the environment, or with new engine emission control systems, or with ballast water treatment systems to avoid biological contamination among different habitats.

We must also consider how the world is getting smaller and smaller and the nations more and more connected and so it is clear that the problem of 'safety' must be faced by all peoples considering this enlarged concept.

Industrial engineering, in all its ramifications, must be able to provide answers to these needs, coordinating different aspects: in the Naval sector, for instance, propulsion systems are spreading, no longer using the various diesel fuels, but gas systems, with all the connected problems of storage and supply, or hybrid or completely electric systems. So the Industry has to deal with the "marinization" of concepts and systems (electrical, hydraulic, electronici, etc.) in order to comply with the regulations. In many cases there is cooperation among these new systems builders and the Classification Registers, in order to develop new 'ad hoc' regulations, adapted to these new technologies.

Hence, with a simple and general description, it is possible to immediately highlight many aspects of Industrial Engineering that connect with one another and influence the safety of a ship.

In fact, it is evident that a ship is a dynamic means of transport: it must move to perform her task that is transporting goods, passengers, or being of assistance to Industrial Engineering, in various parts of the world such as pipelayer vessels or ship cranes used to lift the sections of road bridges

The problem of safety is extremely vast and complex since the final safety of a ship derives from the safety of each component, organized in a way that can cooperate with others.

A classic case in point can be the positioning of watertight bulkheads in a passenger ship: planning as many bulkheads as possible means increasing safety in the event of flooding, but any bulkhead can be an obstacle for passengers in the event of an evacuation. This is the "classic" example, simple and intuitive that is made for naval engineers when dealing with the problem of a ship design and her compartmentalization and it makes the idea perfectly.

Therefore, in this Journal we will deal with all matters concerning safety and its links with engineering, examining all the innovations and technological developments that have appeared in the specific field of Naval Engineering.

The approach, as understood, must be extremely multidisciplinary and open to the examination of each new sector.

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