

CLASSIFICATION OF MILITARY SHIPS THE FRENCH EXPERIENCE

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A. A new way

International rules coming from both main IMO conventions and recommendations and EU or national rules are not mandatory for military ships. Nonetheless, the French Navy decided to adopt a large part of these requirements for its own ships, in particular those from SOLAS and MARPOL.

For that reason, it chose to take into account dispositions considered as relevant in regard with its own military requirements and specific feed back.

Understood as a bottom requirement, such a deliberate choice is covered with a formal decision from the Navy chief of staff: this decision takes the shape of formal written regulations laying down surface warship maritime security global requirements.

Based on these requirements, technical Department of Defence services created brand new conception and construction technical regulations. The most important one is the classification society set of rules, which is built on the same assumptions as the civilian ones. If needed, complementary technical rules can be added, dealing with ammunition storage and handling for instance, but also with specific aviation use, NBC threat process, electromagnetic compatibility, stealthy matters or medical fittings.

Conceiving this kind of technical regulations, the core of which are the classification rules, facilitates the relationships with civilian builders. It also enables better cooperation between navies. Moreover, it is helpful when making choices for “off the shelves” equipments and materials, much less expensive than what used to be specifically designed for the Navy by its former state shipyards.

So, the French Navy is something of a trailblazer within the major navies as it is the first one to implement the same practices as merchant navies for classification. Mistral class vessels are the first combatant ships to be compliant with SOLAS and even MARPOL (clean ship) rules.

Finally, in several aspects, the building requirements level is higher than the one in the civilian way, and this is quite natural for a combatant ship. But, on several matters, the French Navy thinks that choosing adapted civilian rules is a great advance.

While making the choice of this new direction, the French Navy gave the military ship building a new impulse. It is coming closer to the best civilian practices in the field of platform construction in order to make a better effort in the field of military equipment and crew management, both of them the main creating value for a combatant ship.

B. Towards military ships classification

In the year 2000, the French Navy settled to have its new-building surface programs covered by classification process.

This decision was based upon the availability of classification rules for military ships developed by Bureau Veritas in cooperation with the French Navy Admiralty, the French procurement and French naval shipyard DCN.

A Bureau Veritas working group was set up to develop such rules under the supervision of a Steering Committee composed of representatives from both Bureau Veritas, the navy contractor and technical body DGA/SPN, the French Navy central staff (Etat-Major de la Marine), naval shipyard DCN (Direction des Constructions Navales) and a major civil shipyard Alstom Chantiers de l'Atlantique.

In view of selecting the existing merchant rules to be maintained, deleted or adapted, a co-operative structure was set up with 12 specialised working groups dealing with each specific technical area, such as subdivision and stability, hull scantling, propulsion, electricity, automation, materials, combat strengthening needs. Specialists of all the above-mentioned organisations and companies were participating in each one.

Work went on for almost 3 years with an intense activity as the Steering Committee met 16 times and each working group on an average of 15 times.

The working process was to review the new version of BV rules 2000 for merchant ships, to validate the rules to be maintained without changes, to identify the rules non-relevant for military ships and thus to be deleted, and to identify the rules to be adapted to the military context.

An initial version of BV Naval rules was released in French in 2002, then in English in 2003. The latest update is dated September 2006 and includes the lessons learnt.

C. Principles of classification

The ships' classification results in the verification of their conformity to the appropriate rules of the classification society, in our case the Naval ones.

Classification is carried out within a three-step process:

- Design approval: structure, production and distribution of energy, propulsion, fire safety including structural fire protection and fire-fighting devices, escape routes and evacuation, stability.
- Materials and safety related equipments certification at makers works: main and auxiliary engines, propulsion set, insulated bulkheads, fire-fighting equipment, fire detection, electrical cables-switchboards-connecting devices ...
- Construction survey, including kick-off meeting, approval of internal shipyard fabrication and quality plan, approval of welders and of welding procedures,

survey at the yard's premises, attendance to tests and to quay and sea trials, classification certificates issue.

D. Naval programs concerned by classification

1 – BPC “Tonnerre” and “Mistral”

The first program to benefit from classification rules was the BPC one. It was about the two helicopter and landing craft carriers “Mistral” & “Tonnerre” built by DCN and Chantiers de l’Atlantique for the French Navy from 2003 to 2006. They were the first French combatant surface ships to be involved in such a process. Since this time, French Navy clearly follows this way with all her ships.

BPC class is 200 m long with POD propulsion, six helicopter spots. It can accommodate from 450 to 700 embarked troops, depending on the chosen configuration, and 16 helicopters such as NH 90 or Tiger type.

It has been designed and surveyed for full compliance with Ro-Ro passenger ships classification rules, SOLAS and MARPOL. In addition, specific military rules such as NBC, ammunitions, have been implemented

As a result, they benefit from increased safety standards in terms of fire structural protection, fire-fighting automatic systems, evacuation and escape.

BPC strictly fulfils the SOLAS Main Vertical Zone (MVZ) criteria that guarantee a high level of safety, such as:

- A60 structural fire protection at the borders of the MVZ and for all the main escape routes,
- Autonomy with regard to ventilation,
- Autonomy with regard to distribution of electrical energy,
- Autonomy with regard to evacuation, those present in the MVZ can reach the evacuation deck without going out of the zone,
- Autonomy with regard to fire fighting equipment and systems.

On top of this application of a stand-alone set of classification, the rules have facilitated the cooperation between the civil yard “Chantiers de l’Atlantique” in charge of the construction of the vessel’s forward part where the accommodations are located, and DCN in charge of the aft part of the ship, i.e. the military part with the dock and the helicopter facilities.

It is important to notice that the forward part has been towed to Brest where the physical interface was made up and trials carried out by DCN.

Construction of the two ships has been carried out within four years which is a very tight schedule for this size military program.

2 – FREMM

The Franco-Italian FREMM program was the second one to benefit from the classification process. It amounts to 27 European Multi-Mission frigates (17 for France, 10 for Italy).

FREMM frigates are 142 m long, 6 000 tons displacement. In that case, classification rules for military ships released by Bureau Veritas for France and Rina for Italy have been harmonized. It was done under the FREMM Program Management supervision resulting in a unique set of rules, named “BV-RINA rule for FREMM” and applying to the 27 ships.

Dedicated to the FREMM program, these rules have exactly the same structure as standard classification rules including 4 parts:

- Classification principles and survey,
- Hull design and construction,
- Machinery, systems and fire protection,
- Additional notations.

Again, this program benefits from a higher level of safety than before, as the SOLAS principle of Main Vertical Zones has been kept even if adapted to the needs and constraints of a combat vessel. For FREMM the fire safety requirements are derived from IMO A534 resolution for ships carrying less than 200 special personnel.

French FREMM frigates will also be compliant with new MARPOL 12 A regulation. There is a double interest in such a unique design certified according to the same set of rules: first, the scaling down with the use of the same standard for all the 27 ships, second, the possibility to use classification type approved commercial off the shelves equipment.

Using class certified proven automatic fire-fighting systems and bridge ergonomic principle, has enabled to significantly reduce the crew in comparison with previous frigates at a reasonable economic cost. For the French Navy, a crew of less than 110 is strongly under consideration.

3 – PA2 Aircraft carrier

The third program that will benefit from classification advantages is the new French PA2 aircraft carrier. It takes place within the framework of the Anglo-French cooperation for the building of three aircraft carriers (two CVF for the UK and one PA2 for France).

These aircraft carriers will be close to 280 m long, with a circa 75 000 tons displacement and a complement from 1 600 to 1 750.

This is a very complex project, as big as a large passenger ship regarding size and crew figure on board with additional complexity due to aircrafts and helicopters operations.

There will be a high, ninety percent, level of commonality between French and British designs albeit differences due to the use of different types of aircraft and the need for a catapult on board the French vessel. The two projects will be certified according to different standards: classification from Bureau Veritas Naval Rules 2006 for the French one and certification according to military standards of the Royal Navy for the British ones.

The main challenge for this program technical control comes from a quite different approach between France and the United Kingdom about fire safety and evacuation matters. French requirements are based on Bureau Veritas Naval Rules 2006 that integrate notions such as vulnerability zone, safety zone and main vertical zone, where British requirements are based on the notions of NBC and damage control zones.

Solutions to cope with both safety philosophies are under investigation and we are confident that this program will be built to the highest safety standards. However, at the time this paper is written, it is too early to disclose any further details on this matter.

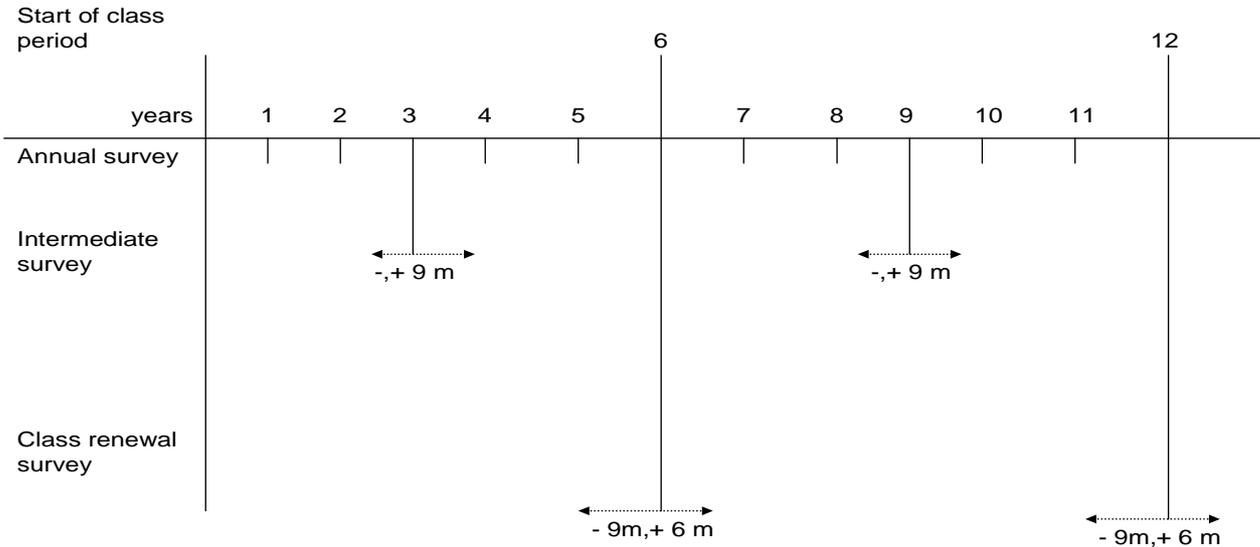
4 – Dupuy de Lôme and Alizé

Dupuy de Lôme, intelligence collection ship of 102 m in length and Alizé, support vessel of 60 m in length, respectively delivered in 2004 and 2005 were also built to Bureau Veritas rules and are maintained into classification conditions.

E. In-service ships classification

Additional to its decision about new constructions classification, the French Navy has also moved to maintaining the in-service ships classification according to the survey regime proposed by the Bureau Veritas Rules for the classification of Naval ships: annual survey, intermediate survey every 3 years, class renewal survey every 6 years.

This survey regime is derived from the IACS unified one applicable to merchant ships surveyed by the IACS members. Taking into consideration the high level of maintenance done onboard military vessels, Bureau Veritas extended the classification term from five to six years.



The annual survey consists in a deep visual inspection of all the safety related items without dismantling, the vessel being alongside.

The intermediate survey focuses on the inspection of the capacities and on thickness measurements.

The class renewal survey is the inspection of all the parts of the vessel with dismantling of major equipment including the propeller shaft and the visit of the hull in a drydock.

Example of the scope of an annual survey: list of the visited items by visual inspection without dismantling

HULL

- General examination of hull & its closing appliances
- Decks
- Hatches, coamings and closing appliances
- Shell plating and rudder part above water-line
- Closing appliances of superstructures, engine casings & skylights
- Bulwarks, guard rails & freeing ports
- Ventilators, air pipes & overflow pipes
- Ladders on weather deck
- Pipe lines & cable runs
- Anchoring & mooring equipment
- Cargo holds
- Engine room
- Main & auxiliary steering gear
- Watertight bulkhead penetrations
- No changes in the structural fire protection
- Loading guidance facilities
- Loading calculator
- Stability file

MACHINERY AND SYSTEMS

- General examination of machinery & boiler spaces
- Check the ER log book
- Testing means of communication
- Examination of bilge pumping systems, including those external to machinery spaces
- External examination of Pressure Vessels
- General examination of the electrical machinery
- General examination of the fire-fighting equipment

E. In conclusion

Besides the advantages in terms of safety of the personnel onboard and of protection of the environment, classification at new-building stage combined with the maintenance in service definitely demonstrate that military ships of the French Navy are not less safe or less clean than the merchant ones they are

This of course does not impair the fighting capability and the resistance to combat aggressions that are covered by additional military requirements.