An new idea for an Italian fast support ship for peacekeeping and assistance in case of events in Enlarged Mediterranean scenario.

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ABSTRACT:

We can say now that the concept of “Global village” is actual, in fact our country played a role of main importance in a lot of scenarios, with the use of our Navy’s ship in several countries and situations extremely various.

In all those situations we basically fulfilled the request of: a quick help, the carrying of materials like med aid, the carrying of troops and mechanized tools for support to the troop, the carrying of mechanized transportations means for police missions and or support to populations involved in a natural catastrophe, like the last earthquake in Haiti.

In all those situation we can underline the main characteristics of the ship operating:

- possibility of a very high top speed to reach quickly the place of operations
- possibility of operate at medium speed , in order to save fuel
- possibility of quick loading roll on roll off cargo
- large amount space for storage of food, provision
- comfortable accommodation for first aid, hospital
- possibility to carry at least 2 helicopters for military operations or for medical assistance

Considering all those aspects, the authors made a critical examination of the state of the art of the ships for support and assistance, considering the various solutions available, and then they made a study of the customization of a ship, that can summarize all those aspects, with an operational speed of above 35 knots if required.

1. GEO POLITICAL SITUATION

As well known the area called enlarged Mediterranean became very important lately for the intense critical situations developed. Not only for civilian wars like f.e. in Lebanon, Balkan area, etc. but also for environmental crisis, large migrations of people.  
In this scenario a military operation has changed its profile, requiring not only classic Navy ships, but also a different kind of support.

In the last years Italy had to operate in different scenarios by sending a fleet composed by both properly called warships and units designed for roles more oriented to support to populations.  
In particular we can remember the support to Haitian population with the Cavour, and lately the support to refugees from North Africa area, and the transportation of them in various port in Italy from Lampedusa isle.

In all the above mentioned situation, more than the military power of the ship itself, that is usually guarantee by other units like air force or naval air force component carried by specialized
ships, it was important the speed of intervention, the capability to carry a reasonably large amount of materials, according to requests that we are going to illustrate.

Basically so, we can affirm that it is important in a modern scenario to have a ship that can perform operations of quick support in events of natural disasters (earthquakes, flooding) and civil war, revolutions, carrying a reasonable amount of first aid goods as medicaments, food, and a component of people in order to guarantee the execution of basic operations of peacekeeping or simply ensuring to protection and safety of the humanitarian operators.

3. THE PURPOSE

As described above, it’s possible to summarize the main characteristics of a ship for this kind of intervention in this way:

**Very high top speed**

It's well know as in emergency situation, caused by natural accidents (hurricane, earthquakes, tsunami) or by other causes (refugees from a civil war, disorders) it is important to be on the place where the assistance is needed in a very short time.

This requires the capability to have an adequate speed; in this situation we will speak about a scenario basically located in the Mediterranean area or the so called “Enlarged Mediterranean” so it's reasonable to consider to sacrifice a certain amount of range in order to reach an higher speed.

A speed of 35 knots, with a 40 knots maybe of top speed can be considered good enough.

**Medium speed reasonable high to save fuel**

In addition to the above mentioned situation, we considered that could be very useful to have also a reasonable high “cruise speed” around 20 knots, that can be reached maintaining an affordable fuel consumption and using (that basically means adding hours of work) a propulsion system easy to maintain and repair.

**Roll on roll of cargo**

Particularly important it is to move easily and quickly roll on roll off cargoes, that can be composed by military vehicles, ambulances, commercial trucks with food, medical aid, building materials, containers and trailers etc.

Of course that implies that the deck of the ship must be strong enough to support heavy loads and it is necessary to have enough space for easy manoeuvring.

Those characteristics must also consider that can be impossible to moor our ship in a traditional way, with the transom against the pier, so we will need to have a transom door and also a side door in case of side mooring.

**Storage for cargo**

In this situation it is important, as already said to have room to carry aid, food, etc, so the space must be prepared to carry single items already packed to be distributed.

**First aid, hospital, recovery**

The above mentioned emergency situations can require to host a large amount of people, and to quickly transfer them away from the emergency situation. It is important to have enough space for an emergency hospital, for first aid and also simply for hosting and accommodating people.

Obviously, considering that usually in case of the events already described the number of victims can be counted in thousands, the total capability of our ship for the wrecked people must be of at least 400 people, plus a reasonable amount of people for the trucks, crew, medics, etc. for a total of over 120 people.

The ship must not be an “hospital ship” or a “cruise ship” obviously, but simply offer the possibility to have quickly in the operational area an unit working and able to provide assistance.

It is obvious that a real hospital ship like the USNS Mercy or the Spanish Esperanza del mar will offer much more comfort, in the same manner a complete cargo ship will be able to carry more load, but our intention was to reuse existing ship at an affordable cost.

**Helipad**

Considering all the above, an helipad for touch and go of 2 small or 1 large helicopter must be provided on board.

4. SOLUTIONS

Other countries solved this problems using several kind of fast passenger vehicles: the US Navy used INCAT catamarans to give assistance to the Timor populations and for Restore Hope operation in Somalia.
The HSV-X1 was a catamaran built by the IINCAT Company in Tasmanian, with the following characteristics:

- $L_{OA}$: 96 m
- $B_{max}$: 26 m
- Speed: > 40 kts
- Full load Displacement: ab. 1650 t

5. OUR PROPOSAL

The deal of this work is considering all the above explained necessities, to suggest a solution that could fulfil all of them, using also something that is already available for the Italian Administration.

In the ’90 in Italy were built four ships for passenger and cargo transportations, called MDV 3000, by the Fincantieri, that in our opinion could be readapted for this purpose.

This could be interesting also for 2 reasons:

1) Actually the ships are not used since a changing in the passenger market

2) A refitting of them could spare time for the construction of a new unit.

Main data:

- Hull: Steel
- Superstructure: Aluminium Alloy
- Length: 145 m
- $B_{max}$: 22 m
- Draft: 4 m
- Propulsion: 2 Rolls Royce Ka MeWa waterjet S180 and 2 S140 side
- Engines: 2 TAG LM 2500 for 21000 kW each + 4 diesel MTU 20V1163 for 6500 kW
- Passengers: 1700
- Vehicles: 450 cars or 130 cars + 100 trucks (44 tons each)
- Payload: 1200 t

The purchase of one of this ships was considered by the US Navy in the ’90, but it didn’t finalize for economical reasons, but we think that a transformation could still be considered.

The following pictures shows the General Arrangement at the present condition. They come from a reconstruction made using images from internet and various magazines.

Profile view and upper decks:
Starting from this we studied a proposal that could interesting due to the condition of the 4 units, that are actually unused.

In particular, a refurbishing of one of the ships could allow a reasonable saving of both time and money since the time for drawing and building a ship of similar characteristics could take reasonably not less than 3 years.

With our proposal the transformation could be completed, only for the engineering aspects in a year.

5.1 Propulsion

We started from the examination of the propulsion system, assuming that the total amount of hours of work in a single year will be not so high, so can be considered reasonable not to invest money in a change to the propulsion system, because the possible saving will not be paid back. Not only that, but it is important to remind that with the actual propulsion system the ship can reach a speed of 40 kts operating with the 4 diesel engines and the 2 TAG, but can also navigate at only 20 kts (or less obviously) simply using a combination of diesel propulsion.

Considering an operational area of the Mediterranean or even the so called Enlarged Mediterranean a speed of 20 kts seems to be enough to reach any operational scenario in less than 4 days of navigation.

Plus the waterjet give an excellent manoeuvrability and limit the full load draft to 3.9 m, making possible to operate also without consider the depth of the mooring place.

So we considered the maintain the propulsion system, the exam of the garage decks showed that they were dimensioned to support truck of 44 t of weight, so the only change could be the opening of at least one side door on a side (or 2, one on each side) in order to make possible disembark at least light vehicles easily, with the ship moored on the side.

For the general arrangement our consideration are: it is important to obtain an helicopter landing area on the top deck, not for transport of helicopter but for a “touch and go” activity of medical support.

So we realized on the top deck an adequate area, checking the feasibility by the consideration that will be possible to install stiffeners below the area without problem. The stability will not be effected by the consideration that the helicopter will be a light type (2.5 t overall weight, and operating in calm condition).

5.2 Top and Upper deck arrangement

First step for transformation is to realize on the top deck a large area for helicopter landing, only in “touch and go mode”. For obvious reason to don't effect too much the displacement this area
will be realized with a simply platform, of adequate strength, supported by pillars.

Then we made an estimation of the use: we consider that the ship should have a capability to operate as “people and material carrier” and also as emergency recovery for people or for transportation of them, so we decided to separate the areas of each deck in two main vertical zones:

- the forward part of each deck is dedicated to the personnel operating on the ship or for the ship; medics, drivers of the vehicles, military, crew;

- the aft part of each deck is dedicated to the refugees.

Starting from top we realized an “hospital first aid area”, with emergency area, ambulatory, and 4 bedrooms for recovery.

Then on the same deck, but separated, there is the area for cabins of people working on board, with a mess and a recreational area.

5.3 Main and Upper deck arrangement:

On the deck below, we considered to realize a large area for people, accommodations for 390 people in seats, with toilets, to be carried easily where necessary, the eating hall, the kitchen and the food storage areas.

Considering the various scenarios, in this study a large amount of space is left free, in order to have the possibility to embark for emergency more people than the expected, in order to give them a shelter, obviously according the emergency equipments, to a maximum number of people.

In effect, it’s our intention to follow a line of “modularity” for the General Arrangement of the ship. In this way the ship can be quickly adapted to different scenarios. For this reason the deck has a large sitting/meeting area, with quick access to the distribution food area.

The last part of this deck is for accommodation dedicated to the crew of the ship, and there is no need of a refitting in this area, except for normal maintenance required by the interiors.

5.4 Garage decks

We didn’t make major changes in the garage decks, except for the two side doors, for quick disembarkation of light vehicles.

But it is important to remind that the decks were structured to carry trucks of 44 t each one, and with an height of 4.5 m.

So it is possible to use the decks for embarking also light military vehicles for police operations like the VLT M Lince (6.5 t.) or the VBM Freccia or even the Centauro (26 t.)

As it is possible to see, the area of the vehicles decks is very large, so it is possible to use them for embarking vehicles or general loads. It could also be possible to reuse some part for accommodations for shipwrecked people or refugees, even if we preferred not to consider this opportunity, and considering this proposal as a mean to have basically a ship capable to carry quick large amount of vehicles of aids on containers on wheels and/or independent way of transport.

5.5 Impact on displacement

Obviously a similar refit must consider any changes in the structure and weight and stability of the ship, so we checked the situation regarding this aspect.

As well known the MDV 3000 were built by Fincantieri with attention to the weight, in order to reach the high speed promises.

We consider that all the furniture in the area to be remodelled will be dismounted and the new ones will be realized with different materials.

Then we considered that the initial weight of the passengers and personal effects (1784 people) was close to 170 t.

In our intentions the total capability of the ship can be considered as 200 people carried as “staff” (medics, soldiers, operators, truck drivers) plus 500 refugees in seats or accommodations.

This will mean a margin in weight of at least 100 tons, largely enough to compensate the weight added by the new accommodations.
It is also important to consider that probably the ship will operate in two different ways. On going to the place of intervention, the ship will be carrying goods, trucks etc. Leaving the place of intervention and moving away refugees and other personnel, (diplomatic and personal items etc) the most part of the load will be consumed or left behind.

6. CONCLUSIONS

As it is possible to see from the General Arrangement, the new idea is not to make a “completely new” kind of ship, but the smartly reuse something that has been already built, in order to allow Italian Administration to save the costs of maintenance of 4 ships actually neglected, and to have new tools to efficiently operate in an international scenario.

7. REFERENCE