NEXT GENERATION

NAVAL VESSEL TECHNOLOGY

LÜRSSEN

Advantage for Naval Operations by Capability based Improvement of Mission Flexibility

Fr. Lürssen Werft GmbH & Co. KG

A REVISED GEOSTRATEGICAL SITUATION

The geopolitical situation has become more diverse over the last 1½ years and the momentum for a sound strategical sovereignty has reemerged. The role of vital alliances has become even more important than it has been over the recent years. Those years have been characterised by increasing numbers of local conflicts, terrorism, organized crime and of course piracy which resulted in a rise of asymmetric threats. It seems that somehow the world of bipolar confrontation with regard to NATO and allied nations will play a role for future geopolitical developments and some myths about „old school" capabilities no longer needed have been clearly countered as myths overtaken by reality. The importance of regional security is represented in the impacts for global security challenges. The need for nations to secure their vital maritime domain of their area of responsibility (AOR) in forms of the Exclusive Economic Zone (EEZ) will become more paramount than it has become with the regard to the developments of the first decade of the so called Maritime Century. We are now in 2016 and completely inside this Maritime Century, the challenges have increased, the call for capabilities has not decreased.

Over the recent years a lot has been written about the respective interests and challenges for EEZs which need no repetition. However the following four keywords should be stressed nevertheless: Access and Control, Cooperation, Capabilities.

The **Access** to resources inside these respective AORs is a key to a nation's prosperity which implies a vital access to situational awareness inside their respective EEZ. The **Control** of respective Sea Lines of Communications inside the AORs has never been out of question. Instead the role of SLOCs has been implemented on a higher level while possible scenarios have widened.

The **Demand for Cooperation,** as part of bilateral or multinational alliances, also creates a momentum which should not be underestimated. The **need for a versatile and flexible force** will become more important for nations playing a key role inside areas with confined and shallow waters.

K 130 CLASS CORVETTE, GERMAN NAVY

CAPABILITIES: THE KEY TO WARFARE AREAS

Capabilities are the logical final product of the identified naval missions which are subdivided into tasks. Capabilities are the force enabler inside their respective Warfare Areas which consist of Anti Air Warfare (AAW), Anti Surface Warfare (ASuW), Anti Submarine Warfare (ASW), Mine Warfare (MW) and Electronic Warfare (EW). The triad of Missions, Tasks and Capabilities represented in the Warfare Areas is vital for the understanding of the challenges for the maritime domain especially inside confined and shallow waters.

We at Lürssen follow the above explained triad with a special focus on the capability based approach which is based on our exceptional experience for naval combatants for confined and shallow water operations. This experience in the design of Fast Patrol Boats, Corvettes, Frigates and Mine Warfare Vessels, together with the versatile logistic support vessels provided the basis for our understanding of customer needs. We have followed the processes which lead to the increasing employment of Offshore Patrol Vessels (OPVs) very carefully over the last years and we integrated these developments into our proven designs. In conjunction with the developments and innovations on the systems side new possibilities were given to the operators or better to say new capabilities. However these capabilities, heritage and new, have to be made available onboard the vessels. This availability of capabilities is the core for our vessel designs and integration efforts. But how to discriminate between the needs for high-intensity and low-intensity scenarios?

CLASSIFICATION OF VESSELS REGARDING MISSIONS

We at Lürssen discriminate between the following two core type representatives, in order to classify the prevailing scenarios sets:

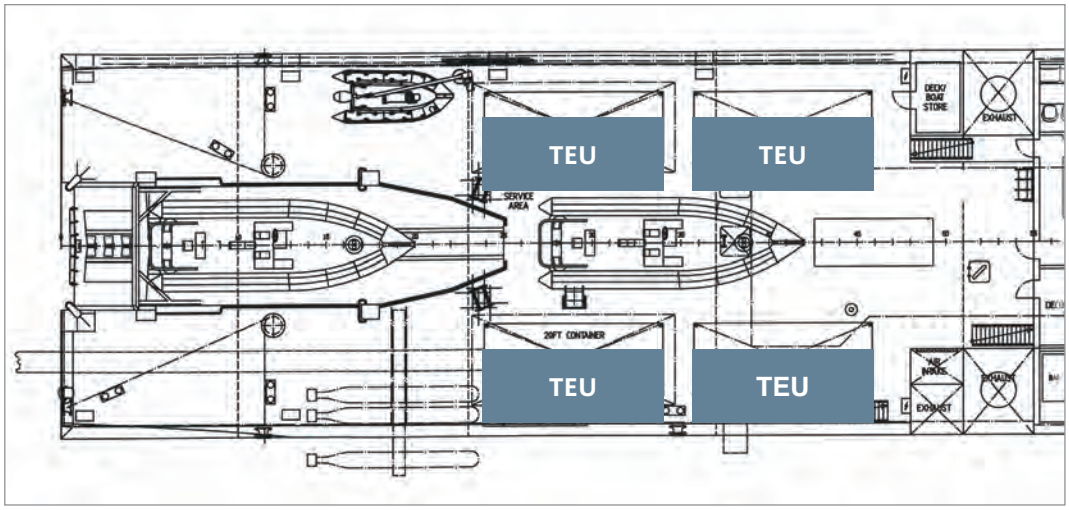
While the Frigate is the master representative of the multi-mission vessel, which can operate in high intensity threat scenario in different warfare areas in parallel, the Lürssen Offshore Patrol Vessels are the proven representative for a flexible multirole vessel as the enabling counterpart for low-intensity scenarios, which also includes complementing missions of above mentioned vessel types. Our Lürssen Offshore Patrol Vessels represent one of the most successful approaches towards these low intensity missions. The OPV 80, as the so called foundation, has been specifically designed to incorporate a diverse capability set. Based on our experience as a naval shipyard, with a long experience in the design for Fast Patrol Boats, Corvettes and Mine Warfare Vessels, our vessels represent the types suited for operations in confined and shallow waters. And together with our experience as the world market leader for mega yachts, a maximum of synergies has been implemented into the development of a now expanding OPV „family“.

The current NATO exercise plan, like Joint Warrior or Northern Coasts, represents on the one hand the focus back on the importance of Joint and Combined Naval Operations, together with the importance of the Standing Naval Forces. And especially those warfare areas which were not „sexy“ enough over the last years, like ASW and MW, have regained their influence for the maritime domain. On the other hand this exercise plan creates even more pressure on contributing nations. Having to thoroughly choose which naval asset can be send to which exercise and to which operations together with participation in standing naval forces. The need for a balanced force structure has not decreased at all and the need for vessels inside the low-intensity scenarios of the maritime domain is even stronger than before due to toe above given facts.

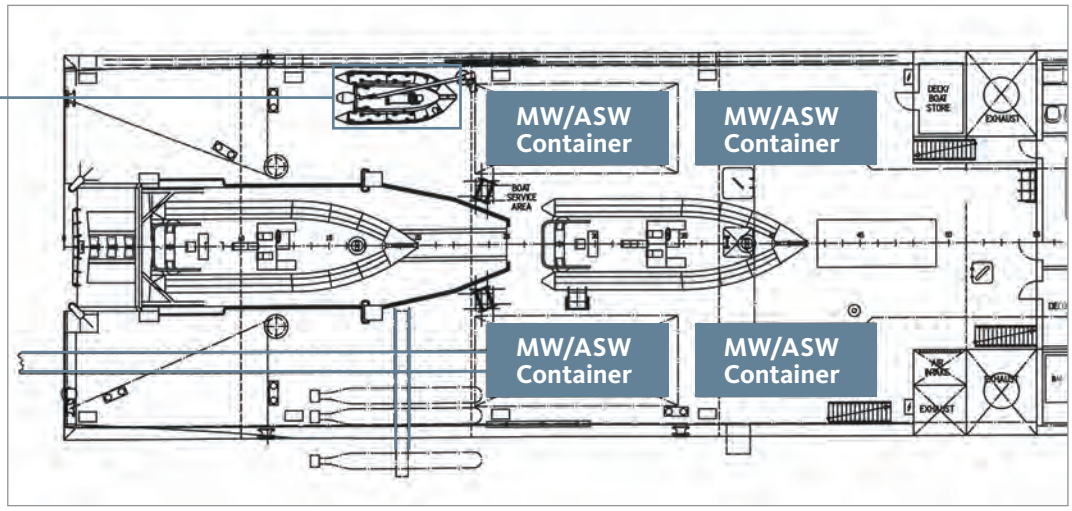
THE „MOTHERSHIP“ OF LÜRSSEN OFFSHORE PATROL VESSELS

How do we at Lürssen think our OPV „family“ can contribute to nations to solve their problems? As said, our OPV 80 has been designed to incorporate a versatile capability set already in its basis configuration, which includes:

- Outstanding stability in heavy seas
- Maximum Crew Capacity of 55 for flexible manning and embarkation requirements
- Accommodation, Work and Rest Quarters designed to meet modern standards and crew requirements
- A sophisticated sensor suite for Patrol and Surveillance
- Command and Control and Communication Systems integrated in a state-of-the-art Combat Information Centre (CIC)
- Weapons Suite for Above Water Warfare including Ship Ship Missiles (SSM)
- Long endurance including the option for Replenishment at Sea (RAS)
- Cost-efficient, environmentally compatible propulsion system with a high degree of Automation for the complete Engineering Department
- Engine Configuration for app. 22 kts
- Full Scale Helicopter Landing Deck, including Crash Landing Capability, for Type BlackHawk and Vertical Take Off And Landing Unmanned Arial Vehicles (VTOL-UAV)
- Mission Deck under the Helicopter Landing Deck for different tasks like
  - Boarding Operations
  - Stern Ramp for RHIB Operations with the option of deploying and recovering up to four RHIBs
  - Container Space for Mission Containers in order to expand the basic capabilities



CONTAINER CAPACITY
Up to 8 TEU = twenty feet equivalent unit e.g.
• ISO container (20 ft, 10 ft)
• 20 ft twist lock frame
• any other equipment with twist lock adapters
Weight of each unit: 8,000 kg



MISSION DECK
Rubber dinghy/w crane
Container space
Launching rails
Overhead side crane
Support of helicopter operations

OFFSHORE PATROL VESSEL OPV 80

MISSION DECK CAPABILITIES

This Mission Deck is a major factor for the deployment of our Offshore Patrol Vessels inside the low-intensity scenarios. This deck allows for different configurations focusing on boarding operations with 4 RHIBs. Or it can be configured for containerised mission components solutions which can integrate unmanned systems, like Autonomous Underwater Vehicles (AUVs) or Unmanned Surface Vehicles (USVs). This is an important factor in expanding available possibilities in complementing the capabilities of Joint and Combined Naval Operations. We like to use the term “force enabler” for this enhancement of missions. We believe the OPV 80 is the ideal force enabler in order to achieve the required balanced force structure and to complement the missions vessels suited for high-intensity scenarios which on the other hands reduces the stress especially for those combatants, enabling them to concentrate on their capabilities required for their warfare areas.

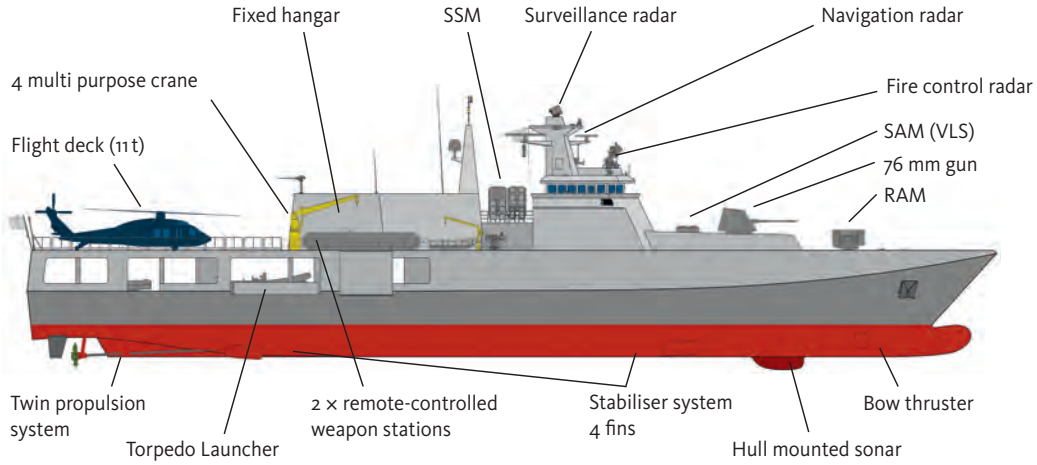
The OPV 80 has enough growth margins for other configurations and capabilities to be integrated. Based on our knowledge of naval regulations, including e.g. German Navy Building Regulations, STANAGs or GL-DNV, we were able to choose the right configuration for customer demands which led to the OPV 80. It was build according to GL Rules and German Navy Building Regulations where applicable.

This design advantage allows for a tailored approach for building rules and regulations in order to improve e.g. combat survivability and seakeeping.

IMPROVEMENT OF REQUIREMENTS

Taking into account the needs for sustained endurance and higher demand in available configurations we have introduced new variants of the OPV 80. These variants are based on the realization of various internal design studies in order to integrate changes of configuration with regard to capabilities.

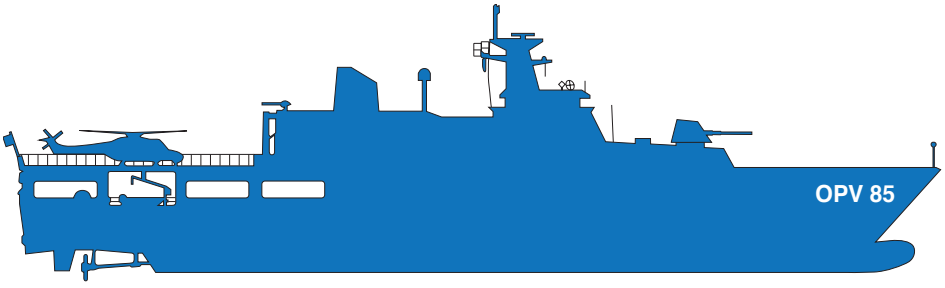
Out of this work we have developed two other versions of the Lürssen OPV „family“: The OPV 85 and the OPV 90. The OPV 85 and OPV 90 are stretched versions of the OPV 80, providing a mission orientated growth potential with regard to system configuration and of course requirements in crew capacity. Installation of medium caliber guns for deployment against Above Water Threats and Coastal Targets is possible as well as the integration of a close range air defence system with corresponding sensors for unit protection and self-defence in a contested environment. If required space for a second helicopter can be provided by means of a telescopic or fixed hangar for protection and maintenance. Additionally the OPV 85 and OPV 90 can also be equipped with a VTOL-UAV as required by the scenario.



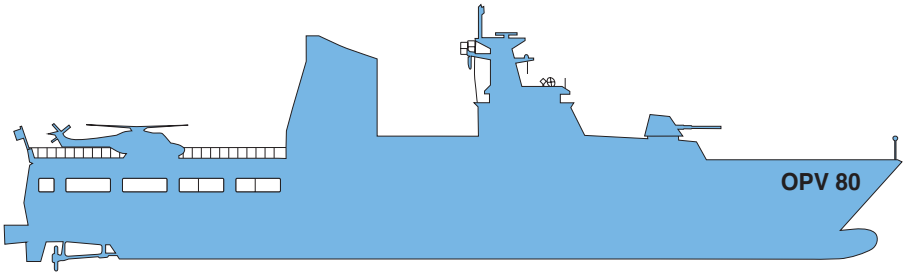
Option ASW: 2 triple torpedo launchers, 1 hull mounted sonar
Option AMW: Seafow ROV, mine avoidance sonar, diving equipment

OPV 90:
Length: 90 m
Beam: 14 m
Draught: 3.5 m
Main machinery:
2 diesel or other option*
Speed: 24 knots

OPV 85:
Length: 85 m
Beam: 13.5 m
Draught: 3.5 m
Main machinery:
2 diesel or other option*
Speed: approx. 20 – 25 knots



OPV 80:
Length: 80 m
Beam: 13 m
Draught: 3.0 m
Main machinery: 2 diesel
Speed: 22 knots



* other systems as per your requirement

OFFSHORE PATROL VESSEL OPV 80

THE LOGISTICAL QUESTION

Of the above mentioned challenges the need for tailored logistical solutions and services is often underestimated. Logistical services can provide cost savings, increase reliability and availability of vessels and maximise the operational potential of naval vessels. Of course the operational derivation of our understanding of naval platforms was in the focus of this piece.

Nevertheless the supporting role of logistical requirements has also increased over the last years. Lürssen is able to accompany this process the same way as we are able to accompany the operational focus. By doing so, we have been able to implement customer support services which provide detailed technical documentations, reliable spare parts, effective training as well as maintaining, repairing and refitting of naval vessels. These services are of course not limited to our own built vessels. For our OPVs we are able to complement the operational demands with a fullscale logistical services package in order to increase availability and operation of the vessels and to ensure that the crew is qualified for the challenges they must encounter. For OPV 80 the versatile capability set was an integrated part of the logistical service solutions provided focusing on the special needs of the customer. This service out of one hand, from the shipyard together with our own services company is one of the advantages we can provide the customer.

CONCLUSION

With our Offshore Patrol Vessel „family“ we offer a mission proven set of platforms with unbeatable versatility based on our task specific combination of capabilities. Our customers can choose between this versatility as required by their respective needs for their naval forces. Together with the above explained holistic approach in understanding of naval requirements we offer a portfolio which enables our customers to fulfill their tasks based on our provided advantage for Naval Operations by Capability based Improvement of Mission Flexibility.

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