

# Shipboard Helicopters of the Navy

For the NATO navies the sea area of the North Atlantic was the supply vein, which needed to be protected. The latent submarine threat posed by the Warsaw Pact led early on to conceptual deliberations to equip escort ships of convoys (usually frigates), which were an indispensable constituent of deterrence for the secured logistical support across the North Atlantic, with ship-based helicopters for an extended acquisition and engagement horizon.

In the 1970s, the respective steps were taken in the Federal Navy of that time. The seagoing fleet was to get embarked naval aviation elements aboard the ships. From the very beginning the plans for the eight F122 frigates (commissioned from May 1982 to March 1990) have taken helicopters as a component part of the system "ship" into consideration. Procured for these ships were 19 shipboard helicopters of the SEA LYNX Mk88 type of the British Westland Company.

On 1 October 1981, the 3<sup>rd</sup> Squadron of 3<sup>rd</sup> Naval Air Wing "Graf Zeppelin" became operationally ready and was able to provide the shipboard helicopters for the antisubmarine warfare (ASW) mission role. For both sides a learning phase began in respect to the new employment possibilities of the helicopter-carrying frigates and the broadened mission spectrum resulting from that. Until the breakup of the Warsaw Pact it was basically still about convoy safeguarding as a primary task – in contrast, transport of personnel and materiel within a task force, support within the scope of situation picture compilation and display as well as the employment as a third party for the firing of missiles by the surface units were secondary non-basic tasks. But the 1982 Falkland War showed already additional possibilities for an employment of shipboard helicopters: SEA LYNX helicopters of the Royal Navy successfully employed guided missiles of the SEA SKUA type against surface targets.

## Expansion of Tasks

For the active engagement of smaller surface units, especially in the western Baltic Sea and its approaches, the 22 land-based Westland SEA KING Mk 41 helicopters of 5<sup>th</sup> Naval Air Wing in Kiel, which were employed for SAR and transport tasks, went through an upgrading program from mid-1987 and were equipped with SEA SKUA anti-ship missiles as effectors and additionally with a new radar. With that they served not only as third parties for over-the-horizon-targeting (OTHT) for fast patrol boats, but were improved by the capability to take on an active role in anti-surface warfare.

With the changing geopolitical situation at the beginning of the 1990s, new security requirements came to the fore. Missions conducted within the scope of crisis reaction with the tasks of sea surveillance, capability for situation picture compilation and transmission, and the possibility for combating smaller surface units have become equally important for the shipborne helicopters beside ASW warfare.

After the end of the first Gulf War in 1991, the first out-of-area mission with land-based SEA KING Mk 41 took place in the Arabian Gulf. Three helicopters were deployed by sea transport. Logistic support (PMC = Personnel, Mail, Cargo) for the multinational MCM vessels cruising off the coast of Kuwait was provided within the scope of operation "South Flank" from the base at the international Manama airport in Bahrain. This meant flying under extreme conditions and weather situations,

In 1993, the embargo missions were launched in the Adriatic Sea with participation of German frigates. This resulted in another shifting of mission tasks of the shipboard helicopters. The intensive area-wide sea surveillance and the delivery of boarding teams for controlling the loads of merchant ships became mission reality. The facet of sea-based evacuation operations with helicopters began with the evacuation of Army soldiers from Somalia in 1993. The SEA KING helicopters have meanwhile become an integral part of military evacuation operations. An additional requirement for shipboard helicopters resulted from the introduction of the F123 frigates in 1995. This led to the procurement of seven additional SEA LYNX Mk 88 A which were placed at the disposal of 3<sup>rd</sup> Naval Air Wing "Graf Zeppelin" as of 2000. The other available helicopters were modified to the Mk 88 A equipment



SEA LYNX Mk 88 Helicopter Being Fixed Aboard Ship after Landing.

Photo: PIZ Marine

which were completely unknown to the crews until then. It became obvious that experiences in shipboard flying operation are also important for crews of land-based helicopters. Refueling during the 6 to 8-hour flights was possible only on board of ships of friendly nations, which, among others, were American helicopter carriers, British landing ships or also Japanese supply vessels. The knowledge gathered during the first mission abroad and outside of northern Europe revealed that the equipment of the helicopters needed to be supplemented with e.g. engine air particle separators (EAPS) and modern navigation and communication sets. Adaptations in the training were also indicated and necessary.

status. Aside from modern, digital 360-degree sea surveillance radar there was also an electro-optical/infrared (EO/IR) sensor integrated, and the capability for firing SEA SKUA antiship missiles, which was adopted from the SEA KINGS, was realized. This allowed carrying out the new tasks resulting from the mission in a safer and more effective way without having to neglect ASW.

With the planning of the combat support ship as a consequence of the now prolonged and worldwide missions of the fleet and based on the knowledge gathered from the past missions, the training in onboard flying operations started for the Kiel naval air unit in 1997. Embarkations onto British and French vessels took place

in order to gain experiences and to develop operational procedures. With the commissioning of the combat support ship BERLIN in 2001, the SEA KING Mk 41 became in its function as a shipboard helicopter an integral part of the combat support ships, which have a capacity to accommodate two helicopters of that size. The mission option of the naval helicopters was supplemented by the sea/land interface for tactical/operational air transports. With that it was possible to make the otherwise ground-based transport component directly available to the task force of the fleet.

The delivering of boarding teams, the air dropping/air landing of special forces in different methods, expand the operational capabilities of the armed forces. And the onboard Naval Rescue Coordination Center improves the medical supply of the military personnel on missions. In addition it also provides directly, flexibly, and quickly capacities for humanitarian aid and disaster control. During the Tsunami relief mission in Indonesia the shipboard helicopters impressively demonstrated these capabilities.

## Flying where the Fleet is Sailing

The demands made on personnel and material in onboard operations is extremely high. Today the helicopters are employed in missions ranging from the cold and stormy northern latitudes of the Atlantic to the tropical waters with temperatures exceeding 35° C in the shade and an air humidity of more than 90 percent. "Flying where the Fleet is Sailing" was and still is the motto of the naval aviation. This must be fully guaranteed in future as well. Unlike the



Naval Helicopter of the SEA KING Mk 41 Type on Search and Rescue Mission. Photo: FMoD

era of the Cold War in which preparations were made for the armed conflict with the aim of producing effect by deterrence, the missions of today are real and confronted with a permanent threat situation.

Here, the asymmetric challenge poses a special type of threat. This makes it imperative to get equipment with passive and active self-protection means for the protection of the soldiers and sailors.

For today's naval forces the helicopters are indispensable as a means of naval warfare, since shipboard helicopters can be flexibly employed in various roles. The options of their employment and range of their sensors and effectors extend the effectiveness and power of the seagoing units. Furthermore, they provide the capability to conduct quick air transports for the diverse mission spectrums. As shipboard helicopters have to be available with a high reliability in the various roles, the training of the technical and flying personnel is also made high demands on.



SEA KING Helicopter Landing on the Deck of Combat Support Ship BERLIN.

Photo: PIZ Marine

## Today's Mission Profiles and Requirements

### Antisubmarine Warfare (ASW):

Detecting and engaging submarines is a basic capability of the shipboard helicopters of the frigates. The number of conventional submarines is increasing and continues to pose a latent – even though no imminent – threat. The use of dipping sonar equipment must be supplemented by a concomitant employment of sonar buoys. Especially in shallow littoral waters multistatic antisubmarine warfare poses a challenge that needs to be coped with. Because of the long range of its

sensors the shipboard helicopter must be enabled to concomitantly carry along an effector to be capable of engaging an identified target with quick reaction. A separation of sensor carrier and effector carrier is no longer suitable to meet the threat, since the capabilities of conventional submarines for long-range antiship operations require an immediate engagement of a submarine when detected.

### Antisurface Warfare (ASuW):

ASuW begins with sea surveillance, i.e. detecting, classifying, and identifying ships and boats in order to prepare and get a picture of the situation independent of the time of the day. This requires a permanent, tactical data link connection (usually Link 11) and continuous 360-degree radar coverage. An additional task is the observation of contacts by means of modern, efficient EO/IR sensors. Shipboard helicopters are particularly suited for that purpose, since it is possible to reconnoiter, monitor and observe large areas of the sea by day and by night. Contrary to the scenarios of the Cold War, the critical contacts are usually made during normal shipping traffic, which necessitates a permanent surveillance of the contacts. The sensors must be designed in a way to safely hold a compiled picture of the situation over a longer period of time. The shipboard helicopter makes it possible for the frigates to observe and monitor a large area of the sea and to act in a target-oriented way. The current missions conducted within the scope of the EU Operation ATALANTA to fight piracy give a clue to the expanse of the sea areas to be observed and controlled.

The two shipboard helicopter types use the heavy machine gun (MG) as an effector to fight pirates – modern missile armament for combating large surface vessels should not be neglected, however. A new quality is needed: Today's scenarios are often very complex and without a clear geographic separation between friend and foe which makes a control of the guided missile during the entire flight imperative in order to allow, if necessary, an abortion of the mission.



Boarding Team of the Navy Controlling a Suspicious Fishing Boat within the Scope of the EU Mission ATALANTA. Photo: FMoD

### Transport of Personnel and Material

The task of transporting personnel and material is part of both the basic duties at home and of the stabilization and response/intervention operations of the fleet. Airlifting of personnel is performed within a task force and at the “sea-land” interface (e.g. exchange of crews on ships). Materiel transports (as internal and/or external “sling” loads) for the support of the units with expendable supplies and material or with spare and repair parts are carried out both within the task force and at the “sea-land” interface. This also includes the challenge to fly into mountainous areas, if required. For that purpose, periodic training phases of 5<sup>th</sup> Naval Air Wing take place in Norway in cooperation with the army aviation.

### Tactical/Operational Air Transports

Tactical/operational air transports allow the airlifting of personnel and material even under tactical operational conditions in a threat scenario. The respective operational limits in respect to range and transport capacities differ greatly and are determined by the mission-specific equipment variants. Depending on the threat situation, tactical air transports are to be conducted preferably by night to minimize the threat and to reduce the probability of being detected, i.e. by use of night vision devices. Comprehensive self-protection equipment for the protection of the helicopter and crew is nevertheless vital and essential. Irrespective of the area of operations (sea, offshore waters, coastal areas) we differentiate between the following employment options:

- **Delivery of Boarding Teams:** The boarding missions in the Adriatic Sea served to control the embargo impositions. This meant that civilian merchant ships were checked out; these were missions with a low threat potential. If the captain of a merchant vessel did via radio not consent to a boarding, it was not performed. In such cases the control was ensured by way of other procedures. Maritime interdiction operations (MIG) as they are practiced in the Operation “Enduring Freedom” mission in the Gulf of Aden cannot be compared with that. According to our understanding, regular merchant ships are not considered suspicious vessels; these are usually small boats, normally dhows; radio contact is not ensured and the intentions of the boatmen are unclear. In consequence this means that boarding teams consisting of up to 14 soldiers need to be quickly and completely landed with the helicopter. The imminent threat that exists until the vehicle is secured requires adequate armament of the helicopter (heavy machine gun – also as a “psychological” weapon) as well as ballistic protection. The raids on ships by pirates show that boarding actions have also to be conducted under direct threat. Respective operational procedures for ship-board helicopters (with transport capacity and concomitant complex sensor equipment) must therefore be developed.
- **Military Evacuation Operations (MilEvac-Ops):** Vessels like the combat support ship are an excellent platform for military evacuation measures. They are characterized by long periods of stay in the area of operations and are capable of also accommodating and supplying larger groups of personnel. The shipboard helicopter provides the air transport capacity for such operations. The more personnel is transported the smaller is the number of the necessary flights and thus concomitant with that a reduction of the endangerment.



SEA LYNX Helicopters on UN Mission.

Photo: PIZ Marine



Employment of a SEA KING Helicopter for the Evacuation of Casualties and Sick Personnel. Photo: FMoD

### Support of and Cooperation with Special Forces

The mission of the Navy will change with the frigates of the 125 class. The ship is designed for stabilization missions and serves also for the support of operations ashore. One option is here the delivery by helicopters of special and specialized forces including their mission-relevant equipment at the “sea-land” interface to prepare, execute, and end operations, i.e. the shipboard helicopters are employed for direct tactical support. This requires the application of special air landing/air dropping methods/procedures for personnel and equipment. This capability is presently being projected with the SEA KING Mk 41 and is to be fully available with the successor model for the F125 frigate.

### Search and Rescue (SAR) and Medical Support

A shipboard helicopter is always also a SAR means. For the own ship in case of “man overboard”, within the task force at sea, but also for acute emergency situations of ships in the area of operations – be them catamaran sailing ships in the Red Sea or the cargo ship in the Indian Ocean. This requires that the helicopter must be capable of taking on the SAR role from any flight profile in order to be able to rescue and recover by use of the rescue hoist/strop and, if necessary, also to provide first aid and quick medical support for the individuals concerned.

In its employment aboard the combat support ship the SEA KING serves as a quick means of transport for the airlift evacuation of sick and wounded personnel (TacAirMedEvac),

e.g. to the Naval Rescue Coordination Center to ensure the first further medical treatment on the level of a district hospital. And in addition, for the transport (ForwardAirMed) of medical-



SEA LYNX Helicopter on a Mission with a Navy Underwater Demolition Team.

Photo: PIZ Marine

ly treated patients or intensive care patients to the nearest hospital ashore and/or for the forward transport to Germany with a MedEvac Airbus of the Air Force.

These capabilities for ensuring the medical support of soldiers on mission are also available for civilian aid and disaster missions. The efficiency in the synergy of shipboard heli-

copters and combat support ship and field hospital was impressively demonstrated during the Tsunami relief operation. Here, the limits of the capability of the helicopter under the climatic conditions prevailing there became apparent, however.

## Outlook

Manned helicopters will have to perform a broad field of tasks in the Navy in future, too. Unmanned aerial vehicles can support here and take on sub-tasks in a purposeful and supplementary way. The limited number of available helicopters in this described wide field of tasks entails the requirement for a multirole-capable naval helicopter. Aside from the smaller, highly maneuverable helicopter optimized for the employment of weapons such as the SEA LYNX Mk 88 A which is going to be employed far into the next decade, a multirole-capable helicopter is needed which must discharge the multiple task spectrum in the transport role and in the support of special forces in addition to the delivery of weapons.

But not only the number of tasks has increased, but also the climatic challenges, as missions in almost all climatic conditions have become normality. Mission under asymmetric threat present the biggest challenge to the train-

ing and equipment. The parameters and requirements for a future helicopter of the Navy for today’s mission reality were formulated; the selection decision for the naval helicopter is expected to be made in summer 2010. ■

*By Commander (GE N) Roland Voigt, Assistant Chief of Branch, Naval Staff.*