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Operating a medium sized shipborne helicopter as a primary shore based SAR- vehicle in the Royal Netherlands Navy

1. Introduction

During the fifth Rotorcraft Symposium in 1979 the Royal Netherlands Navy presented a lecture describing the concept of helicopter fleet standardization and its influence on the Air Sea Rescue operations in the North Sea. The general and specific requirements which had to be met for these operations were summed up. The evaluation process of a standard helicopter was mentioned. A brief description of the helicopter selected, the Westland Lynx, was given.

This lecture deals with the experience gained on Search and Rescue (SAR) operations with the Lynx helicopter in half a decade 1979-1984.

2. The realization of fleet standardization on Lynx

The Royal Netherlands Navy has presently 3 Lynx variants in her inventory. They are identified as UH-14A, SH-14B and SH-14C. Basically they are identical, but they differ in engine performance and/or role equipment. The UH-14A primarily is for SAR and Training. The max. take-off weight is 4425 kg. The SH-14B and SH-14C are for Anti Submarine Warfare.

Their max. take-off weight is 4765 kg. as they have more powerful engines. The delivery of 6 UH-14A was completed in 1977. The last one of a batch of 10 SH-14B was received in 1980 whereas total program delivery was finalized with the arrival of the last one of 8 SH-14C in 1981.

The UH-14A primarily operates from shore bases. The SH-14B and SH-14C in principle operate from small ships but some of them operate from Naval Air Station De Kooy for training of air crew.

As you can read from the viewgraphs the three variants each have a SAR-capacity. This capacity was fully utilized when in February 1982 two embarked SH-14B helicopters rescued 16 Greek sailors from a ship which had broken in two some 500 nautical miles north of the Azores.

3. The UH-14A shore based SAR-helicopter

In addition to the information given on the previous viewgraphs some more details of the UH-14A are given:

endurance	-	2.8	hours
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cabin dimensions:

length	-	2.06	m.
width	-	1.72	m.
height	-	1.42	m.
max. sling load	-	680	kg.
max. hoist load	-	272	kg.

As you can see endurance and cabin space are limited. They are inherent in the relatively small dimensions of the Lynx which enables it to operate from small ships.

The helicopter is able to carry out missions by day and night in adverse weather conditions. A hover meter gives the pilot the capacity to hover in IMC and by night.

- To facilitate operations -

To facilitate operations in the SAR-role a Tactical Air Navigation System (TANS) and radar are installed. The shipborne variants of the RNLN Lynx are similarly equipped, but also have auto-hover capability. The SH-14B, which is sonar-equipped, is furthermore provided with auto-transition-to-hover mode. Because of financial constraints until now the UH-14A is not equipped with these facilities which certainly would enhance the operational capabilities in the SAR-role.

The necessary specific SAR-equipment is divided in two parts:

- a) rescue equipment
- b) medical equipment

The rescue equipment consists of:

- hoist (hydraulically operated, inboard stowed)
- sling for double and single lift
- rescue net
- helicopter stretcher

The medical equipment consists of:

- first aid belt
- disaster unit
- medical equipment panel
- defibrillator

4. Performance in the SAR-role

The performance in the SAR-role is effected by the weight of the rescue and medical equipment and of course by the crew consisting of five, namely 2 pilots, 1 hoist operator, 1 frog man, 1 doctor:

Basic weight	3080 kg.
rescue/medical equipment	167 kg.
crew (5 persons)	475 kg.

Operating weight	3722 kg.
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Max. Take-off weight	4425 kg.
usable fuel(100 kg.reserve)	603 kg.

This gives an endurance of 2.4 hours at IAS 100 kts.

5. The SAR-organization in the Netherlands

The Rescue Coördination Centre (RCC) for aviation and shipping (or otherwise) is situated at NAS Valkenburg. The area of responsibility is the Netherlands Flight Information Region (FIR). Of this FIR roughly 50% is land and 50% is water, mainly the North Sea.

Since June 1981 a coördination agreement exists between all parties involved in rescue in the broad sense (SARCOR-agreement).

Primarily for SAR at open sea nr. 7 Squadron of the Royal Netherlands Navy, based at NAS De Kooy is assigned. The squadron presently has 5 UH-14A's and 6 crews. During working hours a Lynx can be airborne within 20 min. when a SAR-action is called on.

Outside working hours the crew is "on call" at home and should be able to be airborne within 60 min.

- The pilots in general -

The pilots in general are relatively young. After their helicopter training they stay about 3 years at nr. 7 Squadron to become a SAR-pilot. When they have accumulated sufficient flying hours they are converted to the SH-14B or SH-14C to become a deck-qualified pilot in one of the ship's flights. Executing SAR-missions this much contributes to their level of airmanship and experience which they badly need in the single pilot concept during shipborne operations with the SH-14B or SH-14C.

6. Analysis of missions executed from 1979 - 1984

In order to study the missions flown by the UH-14A the information available of each SAR-action was analyzed.

On 132 occasions a Lynx helicopter was actually engaged in SAR-flying. The missions flown can be split up in two categories. One group comprises the medical evacuation flights. These mostly imply the bringing ashore of a crew member which has fallen ill or has become wounded, from a ship somewhere in the North Sea. In nearly all cases it was only one person that had to be rescued. The second group comprises the flights after the reception of distress calls from ships or aircraft and for a variety of other reasons when people were in danger and a helicopter was the most suitable platform to be employed.

The next viewgraph gives an overall look of the number of flights in each category over 5 years:

	1979	1980	1981	1982	1983
MEDEVAC	10	11	15	11	16
SAR	17	10	16	12	14
TOTAL	27	21	31	23	30

The number of persons rescued on these flights is shown in this picture and it represents 171 souls in total:

	1979	1980	1981	1982	1983
MEDEVAC	10	9	20	11	14
SAR	16	6	19	52	14
TOTAL	26	15	39	63	28

The 52 souls rescued during SAR-flights in 1982 should be regarded as an isolated case. Later in this lecture it will be explained what circumstances led to this spectacular number.

To maintain this helicopter rescue capacity a relatively high number of flying hours is required.

- Flying hours have to be spent -

Flying hours have to be spent in training aircrew, in order to keep them proficient, as well as in performing the actual MEDEVAC or SAR missions. An impression of the flying hours spent on actual SAR-missions is given here:

	1979	1980	1981	1982	1983
MEDEVAC	19.9	18.6	23.2	20.9	20.5
SAR	38.1	32.1	27.7	53.2	35.4
TOTAL	58.0	50.7	50.9	74.1	55.9

A considerable number of these 289.6 hours was made during night sorties. Earlier in this lecture it was mentioned that endurance and cabin space in principle are limiting factors in the SAR-operations with the UH-14A. It therefore is interesting to take a close look to the cases where endurance and cabin space have been adversely affecting SAR-operations. The next viewgraph shows the radius of action of the UH-14A for rescue-flights to a maximum of 4 people. The fuel dump capacity of the helicopter enables the pilot to accomodate more survivors in the cabin. This has been demonstrated in 1979 when 6 German sailors were picked-up in one flight and were taken to Great-Britain which was closest to the scene of action. In a number of SAR-actions more than one helicopter had been utilized as can be seen in the next picture. In 20% off all rescue operations with the Lynx 2 helicopters were involved. In 4% of these operations 3 helicopters were used.

The utilization of more than one sometimes was necessary when prolonged operations were in progress and the original crew had to be relieved by a second crew or when the first helicopter had to return because of its limited endurance.

	1979	1980	1981	1982	1983
1 UH-14A	14	7	12	7	12
2 UH-14A	3	2	4	3	2
3 UH-14A	-	1	-	2	-

On two occasions two or more helicopters were involved in searching for survivors of aircrew of aircraft that had crashed.

There have been no rescue-operations where people in danger out at sea could not be saved because of the limitations of the Lynx.

In this respect it is worthwhile to mention the few cases where Belgian or German helicopters assisted during operations close to the Belgium-Dutch or the German-Dutch FIR-boundary.

In these cases the RCC's cooperate intensively and anticipate on things to come.

- the next viewgraph shows -

The next viewgraph shows the breakdown of the total number of sorties and their distance to NAS De Kooy. On 3 occasions sorties were flown to distances between 95-100 n.m. It will be clear that the limited endurance of Lynx doesn't permit an intensive search phase. When necessary a Long Range Maritime Patrol Aircraft from NAS Valkenburg will assist in Localizing the ship. In most cases this assistance is not required, whereas an accurate position is known before take-off of the helicopter. As can be seen quite a percentage of the sorties were flown to distances between 60-80 n.m.

It should be mentioned that a Dutch frigate type ready-duty ship is always present on patrol in the North Sea.

The majority of these ships have a helicopter deck on which the Lynx on a SAR-mission may land for refuel.

7. Example of a complicated rescue action

Most rescue-flights are more or less straightforward and can be regarded as routine actions. On 24 December 1982 two complicated rescue operations took place. Things started with an emergency call from the work platform Sea Fox, which was under tow and had 9 persons on board. Position 51 n.m. West of NAS De Kooy she reported a fire in the engine compartment. Because of high winds the platform was rolling and pitching heavily. Two Lynx helicopters brought the crew of nine ashore. Landing on the platform had been very difficult. High obstacles prevented a standard approach and landing. In these circumstances the decklanding capacity of Lynx proved its value. Later on the same day the RCC was requested to evacuate 42 persons of the Oil rig Trans Ocean 4 which also was under tow and was reported in danger. Position 63 n.m. north-east of NAS De Kooy. Personnel transfers to and from oil platforms are normally executed by Sikorsky S-61 and S-76 helicopters. In this particular case, because of the oil-rig's movements in pitch and roll, these helicopters were not able to land on.

A German Seaking rescue helicopter was also unable to land on. So 3 Lynx helicopters were used to evacuate 42 persons to a fixed oil-rig in the vicinity in shuttle "service".

From there the 42 people were flown to Groningen Airport by Sikorsky's S-61 and by the Lynx. Again, decklanding capacity of Lynx enabled it to land on this moving platform, whereas bigger helicopters could not.

On the other hand the limited endurance and cabin-space made it impractical to bring the survivors directly to Groningen Airport with the Lynx; a distance of 65 n.m. On the scene-of action, far away from the RCC a very good cooperation was established between all participants involved.

In a minute you will see some life pictures of these actions.