PAPER Nr.: 1.

THE HELICOPTER AND THE SEA

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ABSTRACT

It is the intention of this presentation to paint a watercolour of operating helicopters in a maritime environment. (Illustration 1).

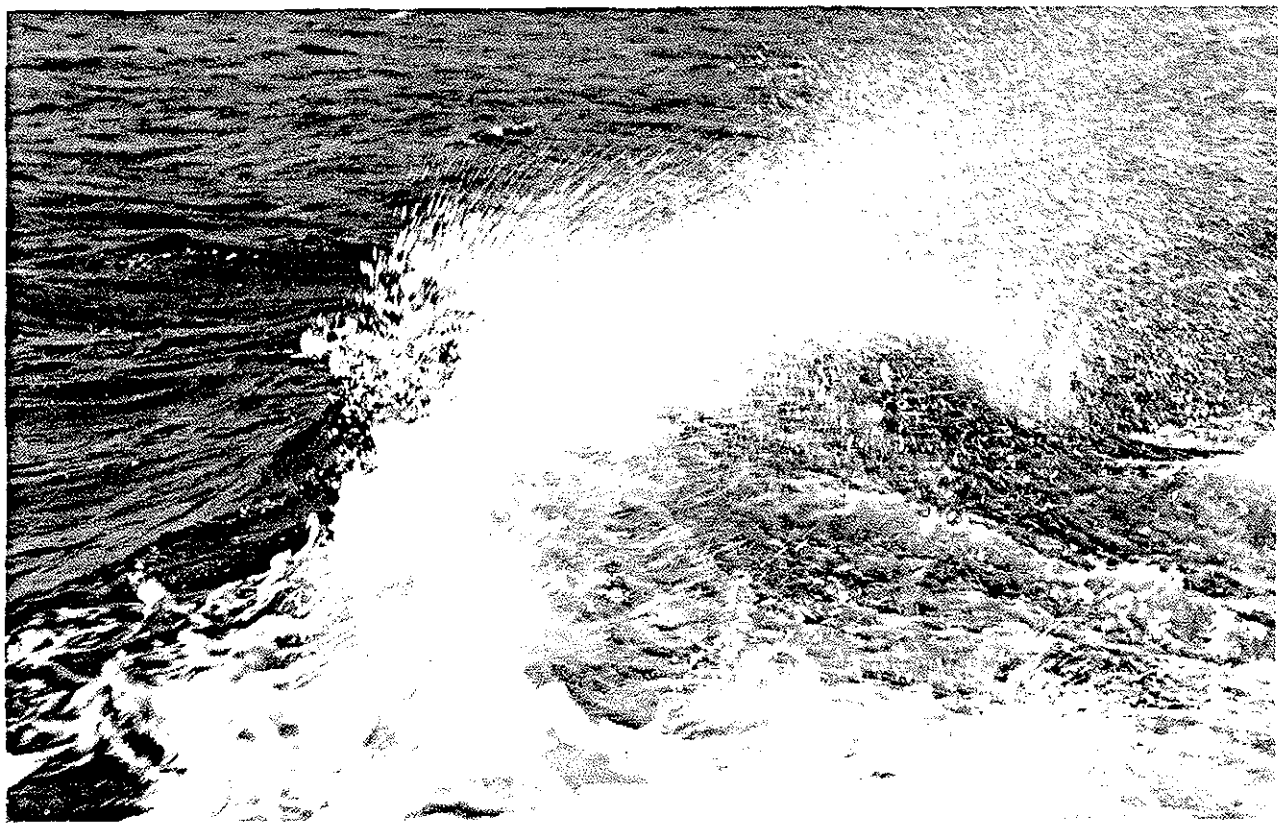

Illustration 1. The sea has never been just the sea.

Many weaknesses can be listed about helicopters in relation to fixed wing aircraft, but helicopters are unbeatable in their versatility.

A wide range of maritime functions can be fulfilled, ranging from transport, via SAR to warfare.

The variety of maritime warfare functions often fulfilled by the same type of helicopter, signifies high demands on the maritime helicopter and its crew. The concept of single-pilot operation under all circumstances particularly puts a high pressure on the training of the pilot. A highly sophisticated, full mission flight trainer, makes it feasible to do more than 40 % of the required flying training in the simulator.

Safety of helicopter operations is paramount. It is achieved first of all by the right attitude and further by a range of technical and procedural means, of which in the maritime environment realistic underwater escape training is not the least important.

The future always stimulates our curiosity. The future theater for the helicopter is broadening. With defense budgets under pressure, the helicopter

airframe has to be more adaptable for a wide variety of roles and equipment fits. Helicopters with an increased all-up-weight are embarking in the fleet, even on smaller ships. This means the growing importance of an adequate securing and traversing system. Other types of platform will enter the aerial market, but the maritime helicopter will stay unbeatable due to its versatility. Examples of strategic issues for dealing with the helicopter in its salty environment are: "to stick to your knitting" and "to control flexibility".

INTRODUCTION

1. General. Ladies and gentlemen, the issue for the coming three quarters of an hour will be "the helicopter and the sea". The illustrations which I will use to visualise the key note subject, will come mainly from the Dutch experience. That is from Dutch civil helicopter operators and the majority, as you will understand, from the Royal Netherlands Navy (RNLN). Of course they apply equally to other helicopter operators.

2. The first three questions that have to be asked are: Why should you listen to me? Why should the subject be of interest to you? And: What will I talk about?

3. Motivation speaker. Maritime aviation has been an important part of my life. The first helicopter on which I entered maritime flying was the Agusta Bell employed in the SAR-role, followed by the famous Westland Wasp, designed to operate in the embarked role. My last but not least experience in maritime flying was on the Westland Lynx in the role of commanding officer of the training and SAR-squadron. I occupied staff jobs in the operational staffs of the Helicopter Group, Admiral Netherlands Fleet and presently in the Naval Staff of the Ministry of Defence. So much about the speaker; now about you. What is the specific relevance of the subject for you as listener?

4. Motivation participants. The Royal Netherlands Navy (RNLN) is an operator of maritime helicopters, but here are also other operators around. Entities such as helicopter operators, helicopter industries, universities, research centers, aviation authorities and special organisations, like the NVVL and the National Aero Space Laboratry, benefit from the exchange of information, ideas, viewpoints and philosophies. At the least this may lead to mutual understanding, and preferably to innovation of helicopter components and a change in approach to all sorts of helicopter related issues. I do hope that this presentation will generate new challenges for future innovation among different representatives here present.

5. Stucture. In my presentation I will touch on the following subjects:

a. the helicopter as such;

b. maritime functions for the helicopter;

c. the helicopter in maritime warfare;

d. safety of helicopter operations;

e. future developments.

1. THE HELICOPTER AS SUCH

6. A closer analysis of the vehicle introduced, teaches us that we are dealing with a vehicle with undoubtedly strong points but admittedly also many weak ones.

7. Weaknesses. Less fortunate features are the following: speed; height; range; noise; safety; comfort; costs.

a. Airspeed. The maximum airspeed for flying is relatively low, in fact limited to roughly 150 knots due to the aerodynamic rotor characteristics.

b. Height. For the same reason the maximum operating height is rather low, limited to roughly 12.000 feet.

c. Range. The same aerodynamic rotor characteristics cause an unfavourable fuel economy and due to the missing wings, restrictions in the fuel carrying capacity.

d. Noise. Where the helicopter flies at low levels, it produces considerable noise, although that is not so important when flying above the sea.

e. Safety. In safety statistics there always seems to be room for improvement and that is important, in particular from the maritime perspective.

f. Comfort. Limited in altitude the helicopter flies in the weather and the comfort of crew and passengers is rather poor.

g. Costs. And last but not least helicopters are expensive to buy, because of the limited markets. Exploitation costs are high, because the depreciation has to be done over relatively short distances and the maintenance costs are also high.

8. Strengths. We can now consider the strengths which make the helicopter the unique vehicle, that we are all so fond of and which justifies our get-together.

9. The obvious strength is the hover capability, which allows the vehicle to enter situations where low speed is essential, for example where landing spots are difficult to reach or are non existant. This also means that this vehicle has the capacity to start and to land from almost every spot within range. I do not think that I have to be exhaustive and may easily conclude that its major strength is its versatility. (Illustration 2).

Illustration 2. "Jezebel" was the first Dutch helicopter to prove that versatility was the major strength of the helicopter.

2. MARITIME FUNCTIONS FOR THE HELICOPTER

10. Talking about maritime functions for the helicopter, both commercial and military, one can primarily establish the following functional sectors: transport; SAR; warfare.

TRANSPORT

11. The transport function can be divided in firstly "over the sea" and secondly "to and from the sea".

12. Over the sea. Regular public passenger transport with helicopters is very rare in Europe. It occurs in Monaco, Greenland and between Lands End and the Scilly Islands. Off-shore passenger transport for oil-rigs is much more important, especially in the Nort Sea. In this scenario ships are less suitable for transport due to factors such as the weather, the long distances and the accessibility of platforms.

13. Transport of personnel to and from oil-rigs in the Dutch part of the Continental Shelf is a major activity of KLM-ERA Helicopters and Schreiner Airways. A fleet of 10 to 15 helicopters is needed, operating from Schiphol, from Airport Den Helder, situated at NAS De Kooy and between the oilrigs. They produce 12.000 flying hours and make 40.000 landings per year.

14. To and from the sea. Taller ships entering and leaving harbours, like Rotterdam and Amsterdam, and the ships bound for the deep water routes, up to 30 nm out, are obliged to have pilots on board. 25 Years ago the first ship was piloted by a helicopter. The helicopter is, besides the use of tenders, an important means, and above seastate 5 sometimes the only means to get the pilot on board. The Dutch Pilot Association (Loodswezen) has accorded the helicopter as an integral, cost effective part of piloting. Schreiner Airways performs a 24-hour helicopter-service from Rotterdam Airport as its homeplate, with heliports at the Maasvlakte and at the docks in IJmuiden.

SAR

15. In the Netherlands there is a coastguard organisation in which 6 ministries cooperate. In the coastguard center the overall coordination is done with regard to SAR actions. SAR duties are executed by platforms of the RNLN. The RNLN operates with Lynx helicopters for this purpose from NAS De Kooy. They fly an average of 100 hours for SAR per year and rescue an average of 50 persons per year from unfavourable circumstances. (Illustration 3).

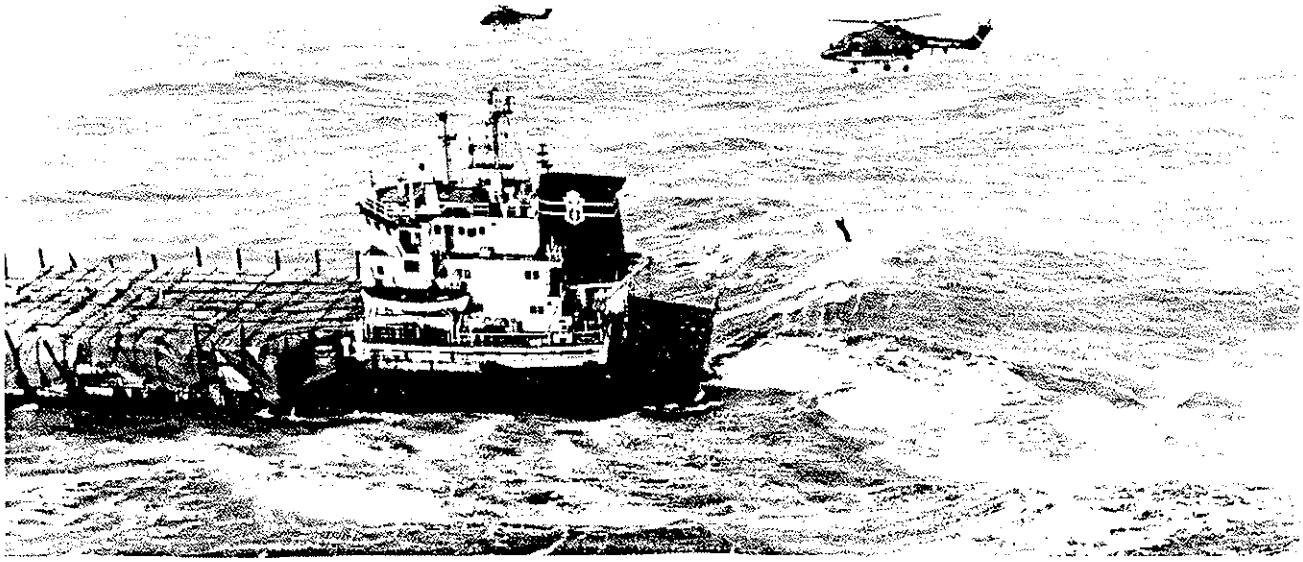

Illustration 3. SAR-duties are executed by platforms of the RNLN.

WARFARE

16. The maritime helicopter as the conventional organic air asset on board surface ships, can be designated for a range of warfare functions.

a. Anti-submarine warfare: starting with sub-surface surveillance, via detection (by a dunking sonar or by sonobuoys), classification to weapon deployment.

b. Anti-surface warfare: starting with surface surveillance, via classification, identification to weapon deployment; (slide B ...; anti-terrorism) a special form of ASUW is anti-terrorism operations, using fast rope, skygenie and spierig technics for boarding personnel on stationary and moving platforms.

c. Mine warfare: mainly done by heavy helicopters like the Sea Dragon, used for mine-sweeping as well as for mine-hunting.

d. Amphibious warfare: transport of troops.

e. Vertical Replenishment: transporting personnel and goods between shore and ships and between ships.

f. And last but not least SAR.

3. THE HELICOPTER IN MARITIME WARFARE

17. The great variety of maritime warfare functions means high demands on the maritime helicopter and its crew. We will have a closer look at the following subjects: the platform presently in use in the RNLN; the concept of operation; the training of the crew; the role of simulation in that training; and the embarked product. But before that I would like to show you a video, taking 4 minutes, to introduce the Dutch maritime helicopter and an example of her most recent context.

THE PLATFORM

18. Now some more details about the platform, the Westland Lynx SH-14D and the way it is equipped for its different roles of operation.

a. Characteristics. The Royal Netherlands Navy bought 24 and still employs 22 twin-engined, small weight, multi-purpose helicopters of the type Westland Lynx SH-14. The helicopter has recently undergone the process of standardization and modernization, which means that all helicopters are upgraded to 22 similar SH-14D helicopters. All helicopters have modified engines, improved instrumentation and a standard sensor and weaponfit. (Illustration 4).

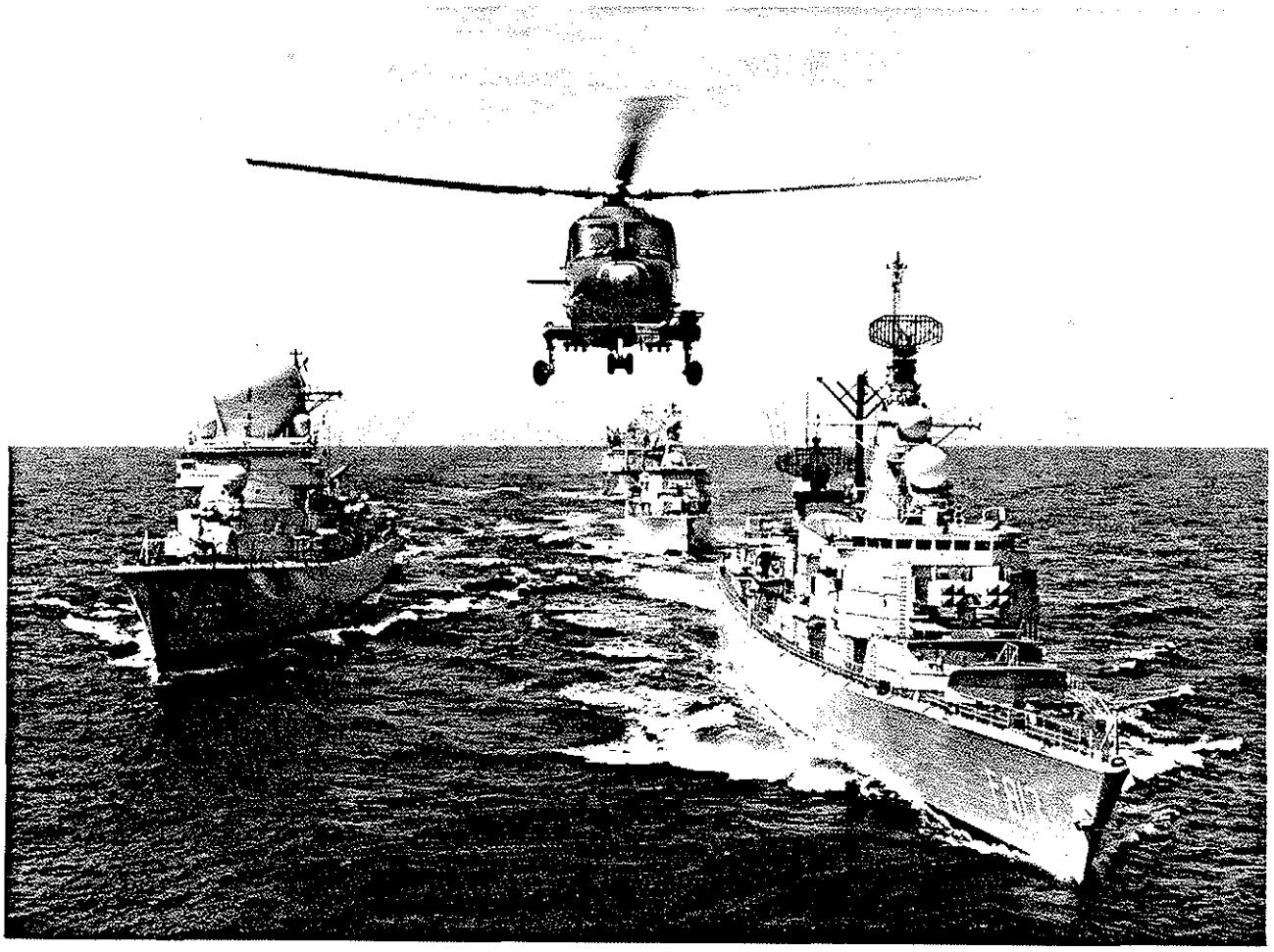

Illustration 4. The Lynx helicopters are upgraded to 22 simular SH-14D helicopters.

(1) Sensorwise the SH-14D is equipped with: a short range, scanning, dunking sonar of the type Alcatel DUAV 4A; a forward looking, I-band radar of the type Ferranti Seaspray; some helicopters are equipped with the thermal imaging system (an infra red passive identification device) of the type FLIR-2000 and a Global Positioning System.
(2) Weaponwise the SH-14D can carry: 2 MK46 mod 5 torpedoes; light stores; and a MAG-gun.
(3) Future expected improvements, budgetted for, are: the FLIR-2000HP; a radar warning receiver; a Global Positioning System; CHAFF/FLARE dispensers; a 4-bags flotation gear.

b. Roles. The SH-14 is operated in all possible maritime warfare roles (except in mine and amphibious warfare) and in all utility roles.

THE CONCEPT OF OPERATION

19. An important aspect of the Netherlands concept of operation is that the RNLN operates the embarked Lynx with a cockpit crew consisting of a pilot and

an observer. Single-pilot operation of helicopters as such is not exceptional, but it is exceptional when we talk about day and night, dunking operations. At the moment the RNLN is the only one that does operate in this way. In this concept of operation the RNLN needs less pilots. They are scarce and expensive, and the crew can be limited, which reduces the weight. No need to say that precautionary measures were necessary, because the work load of the resulting crew increased. With the introduction of the first ASW-Lynx in 1980, the National Aero Space Laboratory said: "It can be stated that single-pilot operation of the SH-14 in the ASW-role can be considered a marginal operation. The utmost care should be bestowed on the selection and training of the crew". (A crew in which an essential role is played by the observer, performing in fact as a non-flying pilot). That has not been said to the deaf.

THE TRAINING

20. There is a wide range of training programmes available, there are programs for: standard aircrew; aircrew for shore operations; groundcrew; ship-officials.

21. The standard aircrew consists of 3 crewmembers, a pilot, an observer and a sensoroperator. Aircrew which will only operate from ashore are: the flight engineer, the frogman and the doctor. The groundcrew consists of aero-engines maintainers and weapon avionics maintainers. A flightdeck crew consists of 6 persons: two CPO's and 4 PO's. Introduction Courses have been made for the following officials: the commanding officer; opsroom personnel like the principal warfare officer and the helicopter direction officer; the officer of the watch; the flightdeck officer; and further for members of the deckparty.

22. Although there is much to tell about the different trainingprograms, I have to restrict myself and will focus on pilot training. We will look at the pilot training before wings, after wings and the overall experience before embarking.

23. Before wings. Before the pilot gets his wings, he has flown fixed wing on the one-engine Slingsby and on the one-engine Bonanza, both at the KLM Flight Academy, where he also obtained the theoretical standard of first class airline pilot. After a relatively short period on the twin-engine Beech King Air he is transferred to helicopter training. For many years the basic helicopter training has been with the Royal Netherlands Airforce on the Alouette. Finally after 20 months he is ready for training in the future maritime environment on the Lynx, from NAS De Kooy. After a generous two years of training he is qualified to get his wings and has reached the status of SAR-pilot second class. (Illustration 5).

	Flying hours	Months
SLINGSBY (1 engine)	65	7
BONANZA (1 engine)	65	6
BEECH KING AIR (2 engines)	40	3
ALOUETTE (1 engine)	75	4
LYNX (2 engines)	85	6

Illustration 5. Pilot training before wings.

24. After wings. In this quality the young operational pilot builds up an ample experience of flying in the different roles, and is prepared theoretically for operating in tactical scenario's by means of a three months tactical training course. Then he is mature enough to be promoted to the status of SAR-pilot first class. In this quality he acquires valuable experience in independant decision making in a maritime environment frequently under unfavourable circumstances. During this period he is trained in dunking sonar operations and in deck operations by day and by night. Eighteen months experience operational flying in combination with SAR-duties make him ready to be transferred to the frontline squadron, where he obtains his crew training together with the other crew members with whom he will form a flight crew. (Illustration 6).

	Flying hours	Months
SAR-2	200	12
SAR-1	170	6
Crew training 860 Squadron	75	3

Illustration 6. Pilot training after wings.

25. Experience. The total experience of the SH-14 pilot before embarking with his flight consists of the following minimal amounts: 100 hours with the qualification SAR-pilot first class; 300 hours on type; 600 hours on helicopters; a total of 750 flying hours obtained over a period of 4 years. This period of pilot training produces an sufficiently experienced pilot, fully capable of performing all kinds of embarked operations. (Illustration 7).

	Minimum hours	Average hours
SAR-1	100	170
LYNX	300	530
Helicopter	600	605
Total	750	775

Illustration 7. Pilot training, experience before embarking.

THE ROLE OF SIMULATION

26. Those 750 hours are all flown, but not all in the real world. The interesting question here is: what is the role of simulation in the training of pilots? We will first turn to that important aspect of the concept of operation, then see how we manage to perform flying hours substitution and finally ascertain the benefits of simulation in an international project.

27. The single-pilot concept. We have seen earlier on, that the National Aero Space Laboratory considered the single-pilot operation of the SH-14 in the ASW-role to be a marginal operation. They recommended that the utmost care should be bestowed on the training of the crew, but they added the following recommendation: "In order to increase proficiency and confidence in emergency procedures, a high fidelity flight simulator is an almost indispensable tool".

28. In the beginning of the Lynx-project in the early 80-ies, the RNLN had been shopping around. Occasional use of the simulator of the RN in Portland was made, and more structural use of the simulator of the British Army on the Rhine in Detmold in Germany. The RNLN did not get her own Lynx simulator until 1987. But she employs the new flight simulator for a wide range of purposes. It is used for improving proficiency, for confidence building in emergency procedures and, in the instance that the helicopter is grounded and that the training of aircrew comes to a grinding halt, the Netherlands simulator is utilised for more: flying hours substitution.

29. Flying hours substitution. The Netherlands simulator is definitely more than an ordinary flight simulator. (Illustration 8). The Lynx Full Mission Flight Trainer (FMFT) is used for the different specializations within the aircrew, in their initial as well as in their advanced training programs. An average of more than 40% of the flying hours of the pilot training program is substituted for by the trainer. It is obvious that there is a limit to the percentage of hours that can be substituted. It is more difficult to train for hoist-operations and formation flying, for example.

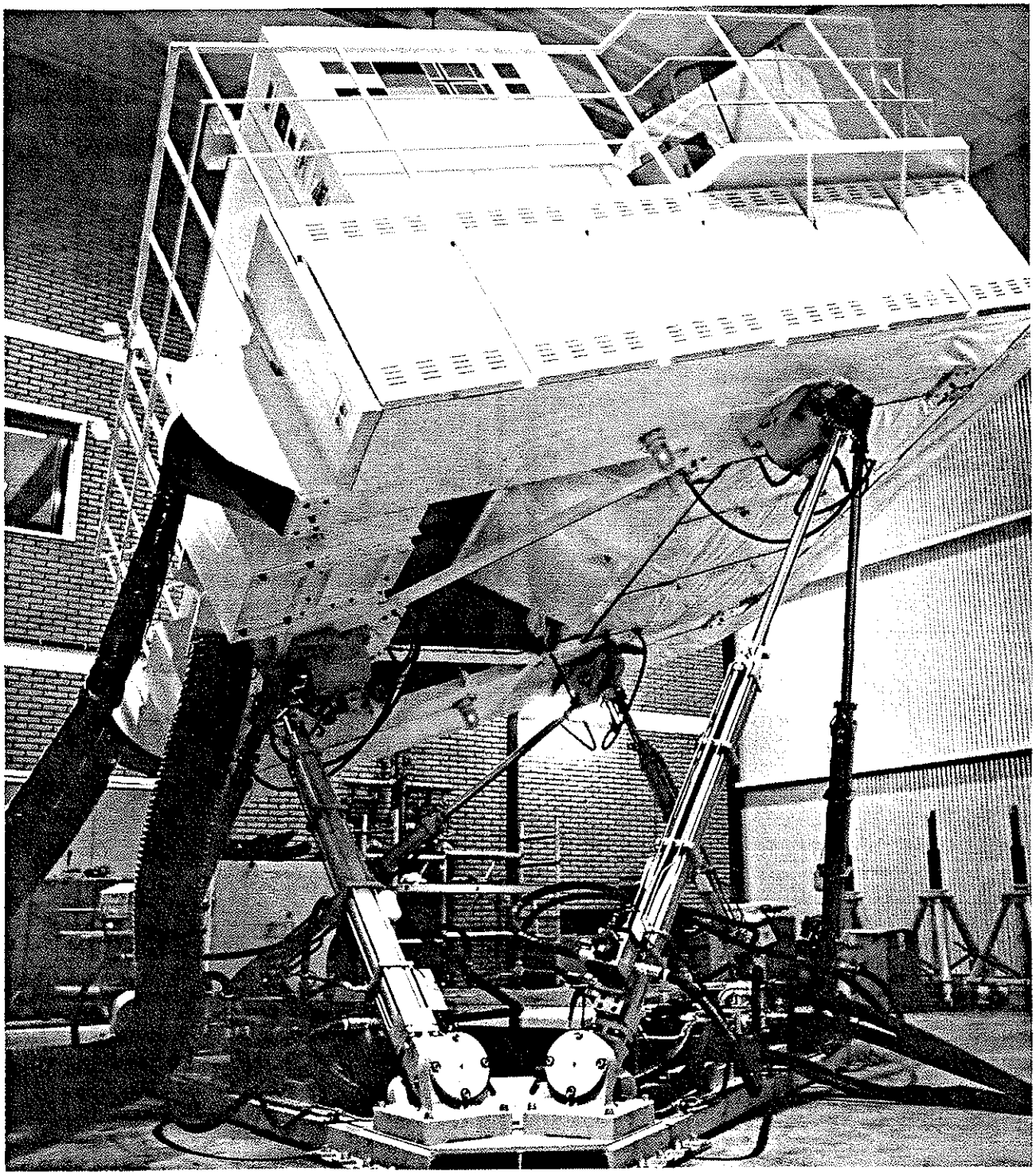

Illustration 8. The Full Mission Flight Trainer is definitely more than an ordinary flight simulator.

30. International project. The Netherlands FMFT is not a national but an international project. 4 maritime Lynx operators are in the project: the FGN; the DAF; the NOAF and the RNLN. Apart from the fact that each user pays in accordance to the percentage of use that he makes, the great benefit lies in mutual support and cross pollination of ideas and procedures.

THE EMBARKED PRODUCT

31. The organisational framework for the provision for embarked helicopter operations is the Helicopter Group, to be found on NAS De Kooy. We will cast an eye over the organisation of the Helicopter Group and then see where you may find the embarked product.

32. Helicopter Group. The Helicopter Group consists, besides a support and a maintenance organisation, of 2 operational pillars: 860 Squadron and 7 Squadron.

a. 860 Squadron. 860 Squadron is the frontline squadron with the so-called mother function. Here the flights are composed and the crew training is done.

b. 7 Squadron. The core function of 7 squadron is to guarantee capable flights tomorrow, you may call this the father function: in concreto the core business is training. Besides this, 7 squadron has the tasks: SAR, anti-terrorism and transport.

33. You may find SH-14D flights on board of the following platforms: 10, gradually diminishing to 4 Standard-frigates; 8 Multi-purpose-frigates; 2 Command frigates; 2 Auxiliary Oil and Replenishment ships and in the near future 1 Amphibious Transport Ship. (Illustration 9).

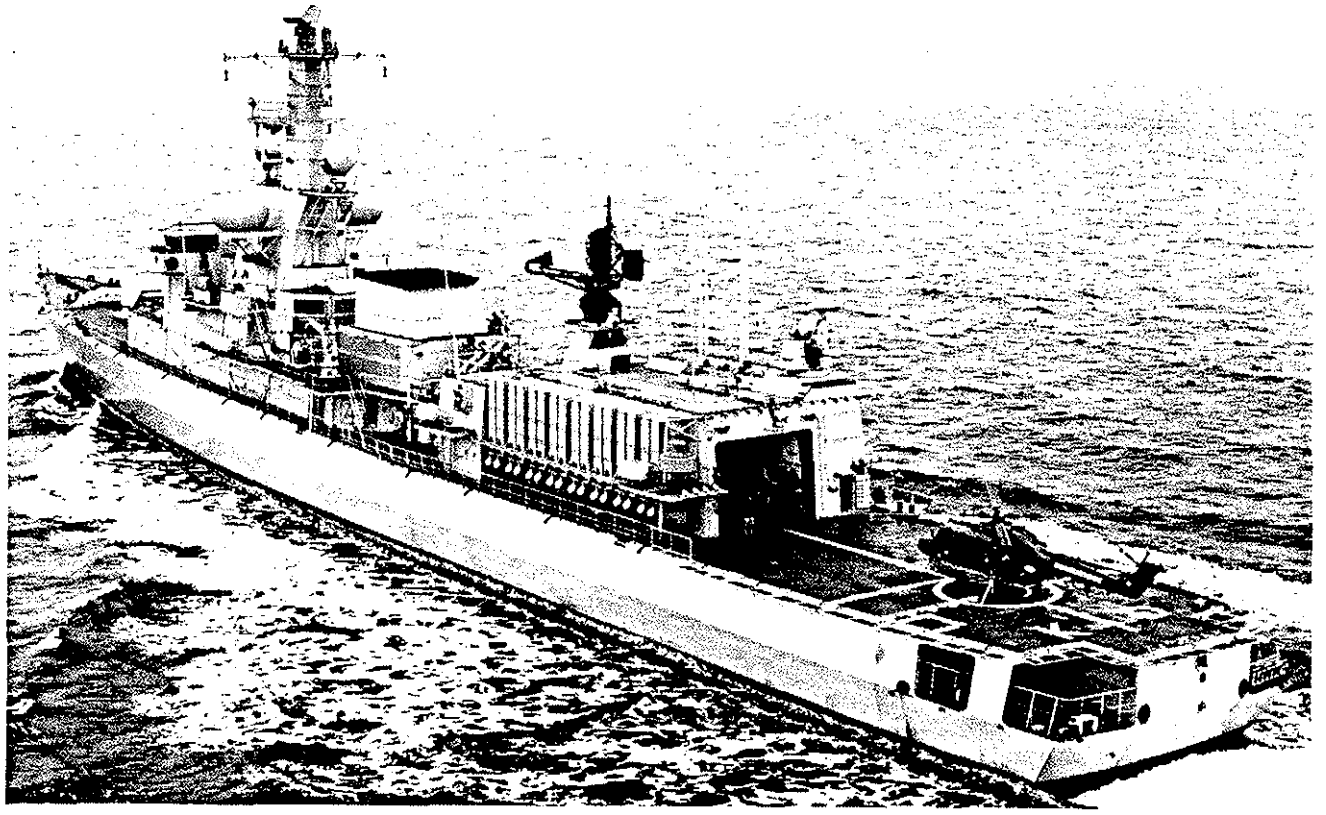

Illustration 9. HNLMS Karel Doorman is the first of the newest class of Dutch frigates.

4. SAFETY OF HELICOPTER OPERATIONS

34. General. The safety of helicopter operations will remain of paramount importance for the future of this business. Looking at statistics there is little difference in safety between civil and military helicopter operations. Commercial helicopter safety however, is less than commercial fixed wing safety, and it is comparable with general aviation safety. The standards are to a great extent determined by the hostile environment of weather and sea. But the utmost must be done to maximise safety. What can be done? In fact we can take measures in the technical and in the operational field.

35. Technical. Technically there is the development of the platform, such as: from single to twin engine; improving floating characteristics by hull design and floatation gear; equipping with push-out windows, exit lighting, double dinghies and locator beacons. The best equipped apparatus however, cannot be flown if the operator and the customer do not have the right attitude.

36. Procedural. Safety is obviously the prime responsibility of the operator, but in civil off-shore operations also of the customer, i.e. the oilcompany and the pilots' association. They take an active role in setting the standards of safety requirements, by means of operational audits and by close involvement in prevention and follow up of incidents.

37. The operator needs to apply a safety management system in his organisation, including a policy, objectives, monitoring, audits and corrective actions. He needs to use appropriate equipment and his crews need extensive training. In addition, the oil companies impose survivability requirements for the passengers who are transported under their responsibility. This includes a preboarding videobriefing, wearing of survival suits and escape training.

38. A realistic underwater escape training cannot been stressed sufficiently, for all personnel who fly over water in helicopters, for crews as well as passengers. The RNLN uses very basic looking, but very effective and efficient trainers, like this one for crew members. The commercial training center RUTH (stands for Realistic Underwater Training for Helicopters) in Den Helder uses a more sophisticated looking trainer of which helicopter operators as well as oil companies make use. (Illustration 10). The latter because it is realized that the flight attendant is not always on board. Pilots in an emergency can be busy with other things, and the passenger needs to have some safety awareness, some sense of self responsibility, and has the right to have some skill. Of course in the field of safety all measures have to be taken to keep aircrew and passengers out of water, but in the unfortunate case that they do get into the water, it is of vital importance to enhance their chances by escape and survival training.

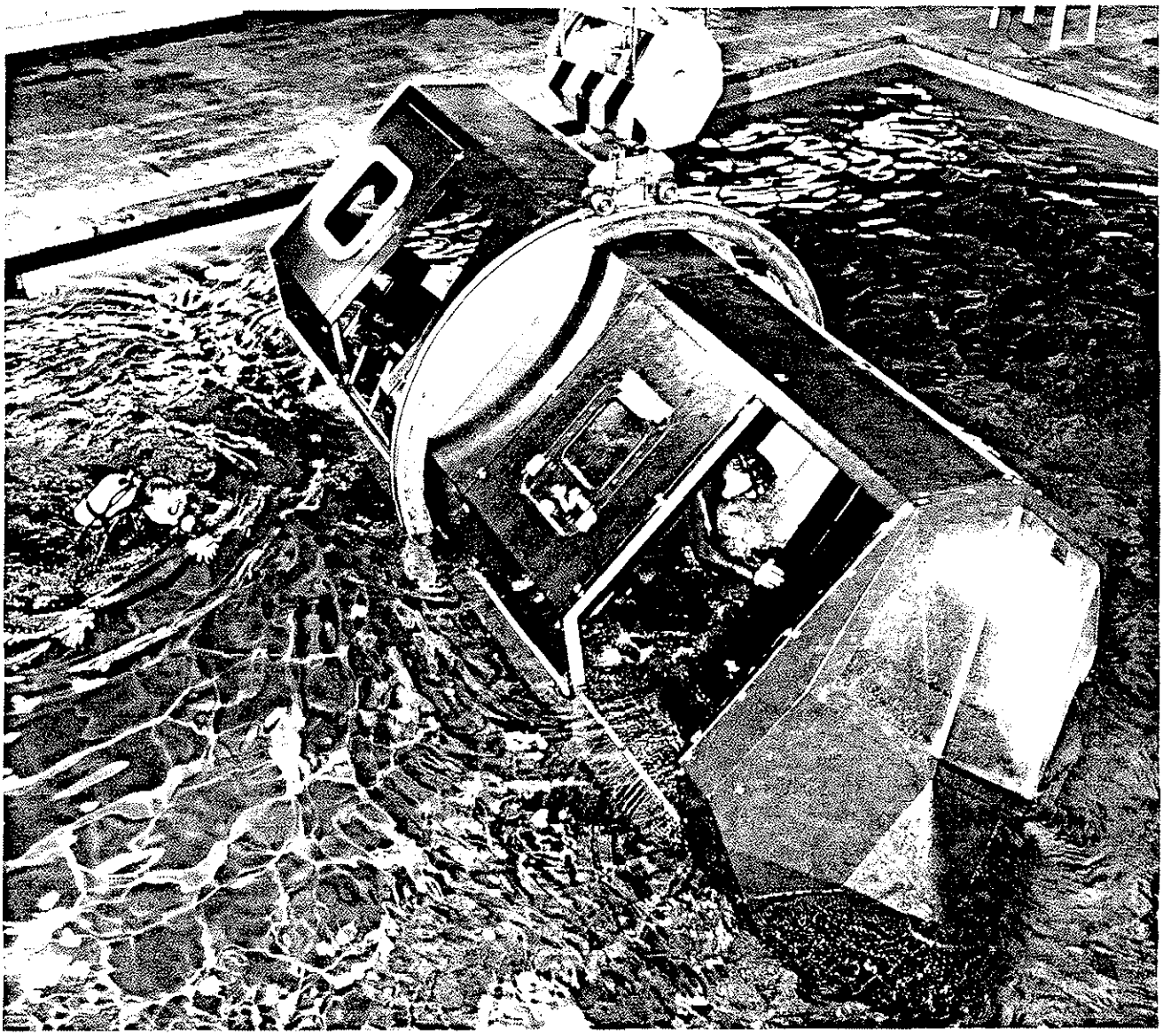

Illustration 10. The commercial training center RUTH uses a sophisticated looking trainer for Realistic Underwater Escape Training.

5. FUTURE DEVELOPMENTS

39. What we are curious about, is the question of the future. One thing which is clear, is that the helicopter platform will be modernized, as I will illustrate. Opportunities and threats can be vaguely identified, and strategic issues, however abstract they may be, can be formulated.

MODERNIZATION OF THE PLATFORM

40. The RNLN has a long tradition of procuring its helicopters off the shelf. It started in the fifties with one Sikorsky S51 (Jezebel), followed by 3 Sikorsky S55 (Salomé), 12 Sikorsky S58, in the sixties 8 Agusta Bell, 12 Westland Wasp and ended in the seventies with 24 Westland Lynx. Now the Netherlands are taking part in the international NH-90 project. (Illustration 11). We will glance at the following subjects: the history of the NH-90 project; the platform NH-90; the concept of operation; the challenge.

Illustration 11. Now the Netherlands are taking part in the international NH-90 project.

41. History. The NH-90 project already dates from 1980, when among others the naval staffs of the UK, France, West-Germany, Italy and the Netherlands made a pre-feasibility study for the Nato Frigate Helicopter (NFH) as part of the Nato Frigate for the 90-ties (NFR-90). This resulted in the outline for the Maritime Warfare Helicopter. In 1982 4 helicopter industries (Aerospatiale/France; Agusta/Italy; MBB/Germany; Westland/UK) made the study for the Tactical Transport Helicopter (TTH). In 1986 these two studies merged in the feasibility and pre-definition study for the NH-90, when 5 countries and 8 defence forces were involved. The NH-90 is now in its design and development phase, with 4 countries involved.

42. NH-90. Now some more details about the NH-90 and its equipment for the different roles of operation in relation to the Lynx.

a. Characteristics. The Royal Netherlands Navy intends to buy 20 twin-engined, medium weight, multi-purpose helicopters of the type NH-90. A helicopter designed with advanced technologies such as: fly by wire; glass cockpit; higher harmonic control; health and usage monitoring and application of the Integrated Logistic Support-concept.

   (1) Sensorwise the NH-90 will be equipped with: a medium range, scanning, dunking sonar; 30 sonobuoys; MAD; a 360 degrees radar; FLIR and ESM.
   (2) Weaponwise the NH-90 may carry: 2 torpedoes; light stores and Helicopter Air to Service Missiles (HASM).

b. Roles. The NH-90 will be operated in the same roles as the Lynx: ASW; ASUW; SAR; anti-terrorism and transport.

43. Concept of operation. In the NH-90 project as well as in the Lynx-project the single-pilot concept plays an important role. At a certain stage during the project definition phase the helicopter to be built, was planned with a crew of 3 or 4, was a weight in excess of 9100 kg. However, that was judged to be too heavy and too expensive. The embracing of the single-pilot concept also by Germany, France and Italy was an important step to get the NH-90 project within the demands of weight and budget.

44. (Talking in this context about the single-pilot concept, means so much as that the cockpit is manned by one pilot and one tactical coordinator. (Of course there is always the possibility of having a pilot in the left hand seat, but at least the tactical information must be available in the cockpit with the tacco looking forward.) This set-up gives the opportunity to the left seat crew member to act as a fail-safe lookout, and a fast responding assistant in emergency situations.)

45. Challenge. The great challenge of the NH-90 project lies in the timely take-off of a sophisticated helicopter, equipped with as many advanced, technological features as possible and able to operate within the desired single-pilot concept of operation.

OPPORTUNITIES AND THREATS

46. Talking about opportunities and threats for the helicopter in the maritime environment, I have to be selective with my questions, but I will mention three: "What is the impact of the changing world?" "How about the helicopter-ship interface?" and "Will the helicopter platform in due course perhaps be replaced by other types of platform like the tilt rotor or unmanned vehicles?"

47. The changing world. An example of the changing world is the growing emphasis on environmental topics. The disaster in the beginning of this year with agricultural poison bags, polluting the beaches of the North Sea, triggers the idea of at least more surveillance at and above sea, also outside territorial waters, in order to realize disaster prevention. But preventive surveillance alone is not enough. Helicopters can play an important role in delivering officials to vessels polluting the environment or breaking the laws otherwise.

48. More specifically in the military field one cannot avoid the significant shift from global to regional operations. From a global blue water scenario with priority for ASW-operations, to the regional, brown water scenario, with the emphasis on surveillance and power projection ashore. At the same time one always has to be ready for the less likely global warfare and to counter the submarine threat. Defense budgets have also come under pressure, which has made it difficult to afford new specialised airframes. Where the contribution of maritime helicopters to the new theatre is even more expanded, there must be consequencies for the adaptability of a helicopter airframe to a wide variety of roles and equipment fits.

49. The helicopter-ship interface. The second question was about the helicopter-ship interface. A cursory look at Jane's Fighting Ships will show that the world's navies take the provision of aviation facilities aboard new warships seriously. In all the Russian and American fleets, there is hardly a warship over 1.500 tonnes being launched today that does not have a helicopter platform.

50. Besides this one may notice an increase in the helicopter all-up-weight, for example the Merlin and the NH-90 entering the fleet, even on smaller ships. This raises the importance of an adequate securing and traversing system to marry the helicopter with the ship with few personnel. Years ago the Royal Navy had developed the "harpoon" securing device, which worked very well in different situations, like here under the Lynx. Other navies have used variations of the so-called "beartrap" system, also called RAST (Recovery Assist, Secure and Traverse) system. (Illustration 12). More advanced systems are underway. The optimum solution to the capturing problem can be given by dynamic simulation modelling programs, in which the six degrees of freedom of the movement of mother ship and helicopter are accounted for.

Illustration 12. The RAST (Recovery, Assist, Secure and Traverse) system at work in a USN FFG with the Sikorsky SH-60B Sea Hawk on the wire.

51. Other types of platform. The last question was about other types of platform. Otherwise formulated: Will we in the next century have a European Rotorcraft Forum about "the tilt rotor and the sea" or "unmanned vehicles and the sea", instead of today's forum about "the helicopter and the sea"?

a. Tilt rotor. The tilt rotor aircraft V-22 Osprey is meant to replace the aging, tandem rotor CH-46E Sea Knight and heavy lift CH-53D Super Stallion for fast deployment of troops far behind coastlines. But because of the factors of cost and size, this can hardly be seen as an immediate threat for helicopters in general. But can this also be said about unmanned vehicles?

b. UAV. Most western navies have a long experience with helicopters as the organic air component of their fleets. However, for quite some time a new type of air vehicle has been on the horizon, the Unmanned Air Vehicle (UAV). (Illustration 13). It is a platform with merely a sensor function, with a large endurance, and is advertised to be relatively cheap in investment and in exploitation, especially because of the absence of aviators.

c. Since 1990 the need for crisis-management operations, such as peace-keeping operations, has increased. In this type of operation an accent lies on surveillance and reconnaissance tasks. At the same time drugs-interdiction operations and humanitarian actions have taken off. In particular in this last sort of operation there is an increasing demand for transport.

d. For a maritime UAV many tasks can be realistically executed. The core business of a maritime UAV is positive identification of heavy surface combattants or small surface craft in a high risk environment and boring, simple sensor flying of long duration.

e. The relatively conventional organic air asset, the maritime helicopter, is a platform with a sensor and a weapon function. Unique tasks for the helicopter can be executed besides all tasks that are seen to be realistic for the UAV. The core function of the maritime helicopter is versatile flying in a ever-changing environment.

f. A changing world demands more organic air assets for surface ships, able to perform a range of duties. The UAV is not a threat to helicopters, in fact it is advantageous to have the UAV as an additional asset, an effective, non-threatening and non-lethal force multiplier asset.

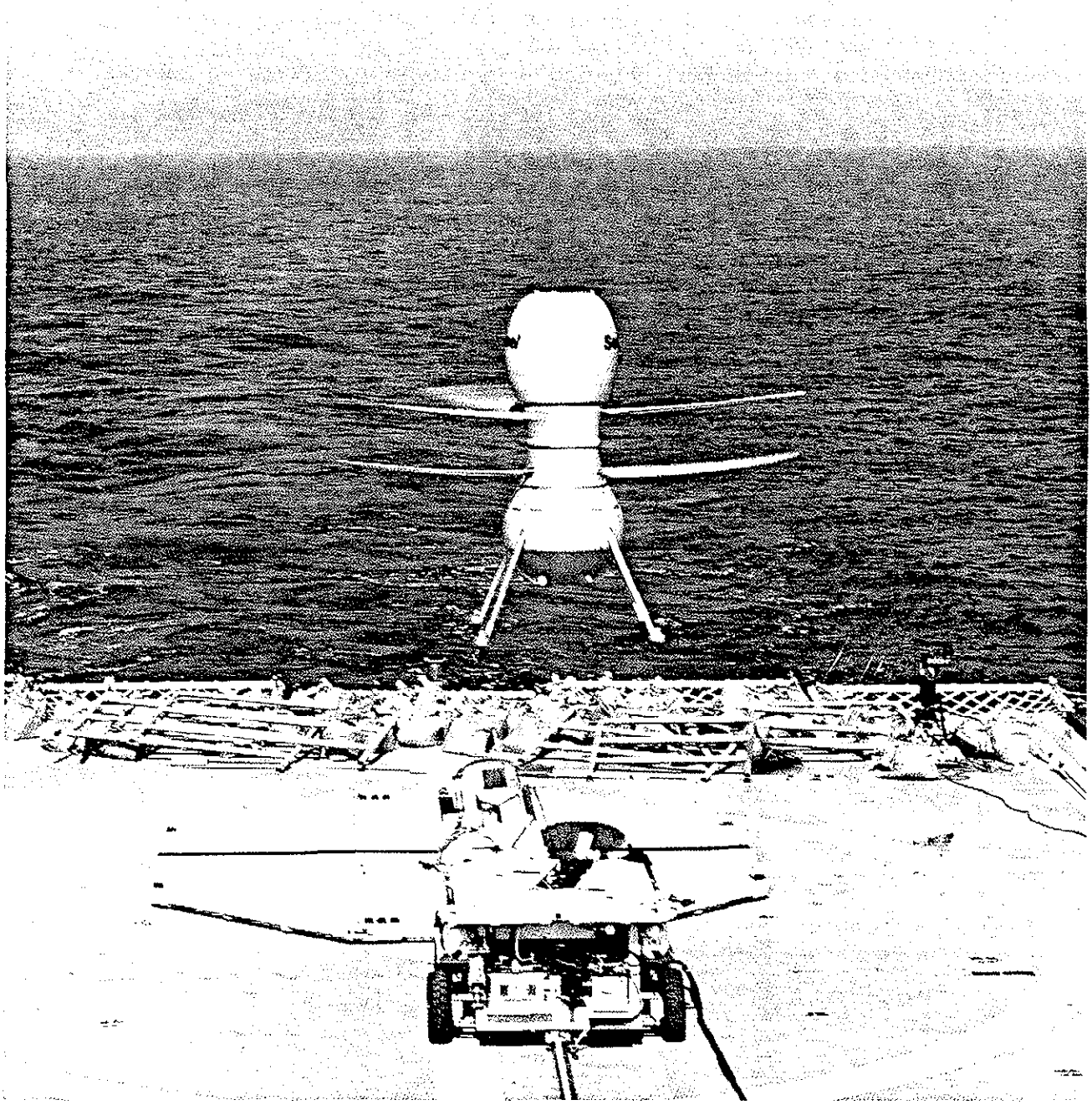

Illustration 13. It is advantageous to have the maritime UAV as an additional asset.

g. UUV. An other platform is the Unmanned Underwater Vehicle (UUV), definitely not a new platform, but it is becoming more and more sophisticated, and in the long run assessed to be a threat for mine warfare with helicopters in the set up as presently in the USN. However there is still a long way to go, particularly in an increasingly unstable world.

STRATEGIC ISSUES

52. Strategic issues are the result of the confrontation of the earlier mentioned strenghts and weaknesses of the helicopter, and the just mentioned opportunities and threats. In my view that may lead to issues like the following.

a. To stick to your knitting. The first issue may be "to stick to your knitting". That means at the strategic level to operate in accordance with your core function, and at the tactical level to do your core business. As you may have noticed in the American press, there has been a real controversy in the US forces recently about the role of the military. Is their purpose efficient killing, or the control of violence in armed situations? Under the first definition humanitarian actions are a waste of energy, in the second one these actions are non-traditional but do fit naturally in the military function of peace builder.

b. Similar thinking is applicable about the helicopter and the sea. In my humble opinion, you may think otherwise, above the sea there is room for two professional flying organisations, the carrier and the navy. The carrier is specialised in the regular transport function, whereas the military is traditionally geared for all sorts of irregularities, like SAR, anti-terrorism, surveillance by day and by night in all sorts of weather situations, and ultimately war. In the Dutch situation the navy is the military that flies over the sea and coast. That does not forbid mutual support with the air forces in case of irregularities on an unusual scale as with "The Herald of Free Enterprise". With regard to the carrier business, KLM-ERA Helicopters and Schreiner Airways are the Dutch flag carriers for maritime operations of the moment, but it is uncertain whether we will be able to stay away from the phenomenon of out-flagging as we have seen in the maritime sector. Perhaps there is more opportunity for profit in the shore related activities. Definitely an interesting question.

c. To control flexibility. There will not be such a thing as flexibility without the required situational awareness. This forum may contribute to convincing each other of the required attitude. In that spirit maritime helicopters will move away from specialisation and become ready for environmental surveillance, law enforcement and flexible rolling. Maritime helicopters must allow swift changes across the role spectrum with, of course, always room for the new sensor and weapon to come.