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AIRCREW TRAINING IN THE NAVAL HELICOPTER GROUP OF THE ROYAL NETHERLANDS NAVY

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1. Introduction.

During all of our existence on earth, the human being has been passing his knowledge to younger generations. Nowedays we are able to give it names and describe the whole process of learning, but it hasn't always been clear how the transfer of knowledge and skills work. Pedagogue all over the world try to explore the brain and all its processes in order to be able to optimise the learning process. As we all know, the human brain is a complex matter and to understand the learning process we must first make a distinction between three "levels" in our brain, consecutively the reptile brain, the mammal brain and the human brain.

The human brain

The reptile brain, in the neural chassis, is the "oldest" part and arranges all basic functions, reflexes and instincts like fear, sleep, drinking eating and sex. The mammal brain, in the limbic system, evoluated in millions of years and arranges emotions, non verbal communication and basic learning from experience. The youngest part of our brain is the neocortex, and we call it the human brain. This human brain orchestrates the specific human functions like thinking, intuition and learning. It is essential to know what part of the brain is responsible for certain behaviour, to be able to train human beings in complex environments in the most effective way. One thing we must never forget, flying civil or military aircraft, is dangerous because you cannot freeze or run away from trouble! For this reason we must stress on safety for everything we do in the air. Flight safety awareness must become an essential part of all processes in our brain.

2. Naval Helicopter Group of the Royal Netherlands Navy.

The Naval Helicopter Group is part of the naval air wing of the Royal Netherlands Navy. The homebase of the Naval Helicopter Group is Naval Air Station "De Kooy" a few miles south of Den Helder, the Royal Netherlands Navy main naval base.

Naval Air Station"De Kooy"

The Naval Helicopter Group consists of two squadrons, 860(NL) squadron and 7(NL) squadron, a maintenance department and full airfield services. The Royal Netherlands Navy operates with 21 Westland Lynx helicopters. The Lynx has been in service with the Royal Netherlands Navy since 1978. These helicopters, recently modified by Fokker with GPS navigation equipment, forward looking infra red(FLIR), radar warning receiver(RWR) and chaff and flares launchers, are now again capable for their tasks. The Lynx will be relieved by 20 NH90 helicopters from 2007 onwards.

7(NL) squadron is both an operational and training squadron. All maintainers and aircrew get their training here. Apart from training , 7(NL) squadron has several operational tasks. The most important operational task is Search And Rescue(SAR) in the Dutch Flight Information Region. This includes the Dutch part of the Continental shelve where

numerous oilrigs, extensive fishing and high density shipping are being watched and more than a thousand lives have been saved in the past years.

Search and rescue

Another important task is to provide military assistance to the civil services together with special forces of the Royal Dutch Marines and police forces. Tasking for the Netherlands Coastguard consists furthermore of flying fishery and environmental inspection patrols

Special forces

860(NL) squadron is the Royal Netherlands Navy's frontline squadron. It consists of 8 embarked flights(aircrew + maintainers) operating from frigates, fast combat support ships and the amphibious transport ship.
The maintenance department takes care of all helicopter maintenance on NAS De Kooy and of the embarked flights.

Since all training takes place at 7(NL) squadron, together with the operational tasks, we think we found the ideal matrix in the process of passing knowledge and skills to future generations naval aviators.

3. Aircrew training in the Naval Helicopter Group.

The Royal Netherlands Navy operates her helicopters in a single pilot concept. This concept of operating shipborne helicopters under all circumstances with one pilot, is unique in the world and considered a "marginal concept". When the Royal Netherlands Navy started shipborne operations with the Lynx helicopter in the late 1970's, we had to change our whole concept of operations. Until then we operated the Westland Wasp helicopter as a shipdirected weapon carrier and had to change to a independent multirole weapon system, the Lynx with dipping sonar.

Dipper

We introduced the airborne Tactical Coordinator (tacco) in our helicopters and also gave him the task of "non flying safety pilot". Operating as an independent weapon system in a single pilot helicopter requires unique qualities from the pilot and the tacco, together with a tough training programme.

Both pilots and tacco's have a long way to go before they start the final part of their training at 7(NL) squadron on the Lynx. Pilots train on a PC7 Pilatus for 100 hrs, a Beach Kingair twin engine for 40 hrs, a Schweizer helikopter for 35 hrs and a Twinstar helicopter for 36 hrs. This training programme, partly flown in Curacao, takes approx. 2 years to complete. Observers start their flying career at NAS Valkenburg, where they get their first flying experience with 321(NL) training squadron on a

specially equipped P3 Orion. It takes a year for an observer to earn his wings and to become a Navigator Communicator on a P3 Orion maritime patrol aircraft with the frontline 320(NL) squadron. They start at 7(NL) squadron with approx. 2 years of operational flying experience.

Pilots earn their Wings after aprox 6 months of training on the Lynx, after which they are qualified to operate as 2nd pilot in an operational SAR-crew. During the next two years they get the ideal mix of operational flying and training, preparing themselves for single pilot shipborne operations. First they will qualify as 1st pilot in a SAR crew and deepen their experience as pilot in command, while parallel they get their specific training for shipborne operations including deck landing qualification, dipping sonar operations and mountain flying.

It takes a year to train an observer and qualify him as a tactical coordinator on the Lynx helikopter. Not only do they learn how to operate the navigation and communication equipment as a 2nd pilot, but also how to use the Lynx and other airborne and floating units as a weapon in anti submarine warfare, surface warfare and special operations.

You can imagine that it's not an easy task for the Royal Netherlands Navy to get Lynx aircrew to operate safely and effective as a independent weapon and outside sensor for the fleet. It is crucial to understand that training is everything in order to keep the brain functioning, so the crew act most effective and safely under all circumstances.

The intelligent human being normally lives in the neocortex world, we react with reason. Suddenly something happens, a conflict or danger develops and immediately we are no longer able to reason intellectually as we were able to a millisecond earlier. The intelligent human being becomes an animal and reacts like one. Sometimes people are determined to survive and react aggressively, but sometimes people are just scared stiff and don't react any more at all.

The word is**: Training**! When we train, we not only exercise and improve or maintain the technical skills, but also train our brains, and try to prepare the cockpit crews for as many situations as possible. It is an illusion to think that we are able to prepare cockpit crews for every possible situation, the aim therefore is to train the human brain in a standard reaction without the need for intellectual reason! The mammal brain is the part of the brain that will be used for this "automation". When the initial automated actions are initiated, and the whole crew is reacting, the human brain can start to work and find solutions for complex situations.

Together with the training of technical skills like operating equipment or flying, there is a training of non-technical skills. The Royal Netherlands Navy adapted the Aircrew Coordination Training(ACT) from the United States Navy, and integrated it completely in her aircrew training and qualification programme.

Decision making
Assertiveness
Mission Management
Communication
Leadership
Adaptability / Flexibility
Situational Awareness

The seven non-technical skills

The ACT Programme Manager at NAS De Kooy gets his training at the Naval Aviation Schools Command at NAS Pensacola, Florida, and is responsible for the integration of the programme. The ACT, or crew resources management takes place in a crew-concept with the extensive use of the Full Mission Flight Trainer(FMFT), a state of the art, full motion, daylight vision simulator, and is an important part of our training philosophy, which enables us to improve the effectiveness of the entire crew.

4. **The use of training aids**.

Learning from experience is the best and most effective way to learn. Pedagogue found out that the "learning from experience", the automation of tasks, takes place in the mammal brain and therefore has to be trained extensively. If you have an instructor sitting next to you who intervenes on the wrong moment, you either learn nothing or crash. This is a very expensive way of training aircrew and not the most popular way. We therefore need training aids that will give aircrew the possibility to learn from their mistakes.

It begins with a cockpit mock-up on which aircrew can train emergencies. The second step is the Lynx Radar Navigation Trainer(LRNT) where the student can learn how to use navigation and communication equipment and how to handle simple emergencies. This LRNT uses the same database as the FMFT

and crews can perform procedural training on it before they train the same scenario in the FMFT. After these relatively cheap training aids, the aircrew start training on the real aircraft and the FMFT simultaneously in an idealy mixed programme.

This FMFT had an update recently and has already proven its effectiveness several times. Several years ago, a Lynx had to make an emergency landing near NAS Valkenburg in a populated area under extreme circumstances. The first thing the pilot said after he got out of the damaged aircraft was; “It’s just like in the simulator”. The investigators of the crash came to the conclusion that had the pilot not acted this swiftly without hesitation(automated action, driven by the mammal brain), the malfunction of the flightcontrols would have resulted in an uncontrolled flight, followed by a crash with probable loss of all life.

The Full Mission Flight Trainer

We not only use the FMFT during specific parts of our training but continuously during all operations. Aircrew get the ideal mix of simulation and reality in order to get through to that part of the brain that enables us to perform under extreme circumstances. Special camera’s are fitted in the cockpit to register the behaviour of the crew and their reaction on difficult situations. Differently from airline aircrew, military aircrew always have to take into account that the enemy is somewhere out there, and trying to ruin your day. Therefore the training of some malfunctions or situations is slightly more complex and require more and a different training.

5. The Future

Just recently the Dutch government signed a contract for the acquisition of 20 NH90 helicopters. We will also operate this helicopter in a single pilot concept, like we do with the Lynx.
The NH90 will be a larger, more complex and more potent weapon system operated by one pilot and one tacco in the cockpit, assisted by a very sophisticated computer system.

The NH90

We believe in this concept, and we believe in our aircrew but one thing must be clear. We can only keep on operating safely and effectively when we continue with our current method of training. We need a fully integrated Full Mission Flight Trainer in the future on NAS De Kooy, to prepare and train aircrew for the difficult tasks the future will doubtless bring us.