

TWO NEW DUTCH HERCULES PLANES

PART 1 - FOCUS ON NEW DUTCH HERCULES

For some time the Royal Netherlands Air Force (RNLAf) felt the urge to expand its transport capacity. Since several years international missions far from home quite heavily taxed the two C-130H-30 Hercules transport planes. After receiving green light and permission to search on the second-hand market a good option was found in the huge storage area in Arizona. It concerned two ex U.S. Navy planes in considerably good condition. After a complete transformation at Marshall Aerospace the first one, G-988 was formally transferred to the Operational / Maintenance Test and Evaluation (R / MT & E) team Air Force under the watchful eyes of former Secretary of State for Defence Jack de Vries on march 2nd 2010, but there is more to be done.

O/MT & E PROCESS

The operational test and evaluation team of the 336 squadron was tasked for the job. This squadron consists of eight people including three pilots, three flight engineers, two load masters and was headed by Captain Mark Brouwer. Mark likes to explain to our magazine what is involved in such a process. The C-130H G-988 is heavily modernized and requires a completely different management which is quite new to the Royal Netherlands Air Force. Besides the testing work of the mentioned team also Incidentally "operational testing" is done by the technical service involved in the maintenance part. Funny thing is that the G-988 and its sister plane the G-781 ever used to be an EC-130Q in operation by the US Navy as 'very low frequency' (VLF) platform' for communication between headquarters and strategic submarines equipped with ballistic missiles. The two airplanes are examples out of a series of 18 built in 1984 (G-988) and the second one in 1978 (G-781). Both were put out of service in 1991 having served in a relative short operational time.

Of more importance is the way how the Hercules's have been deployed, more specifically in almost all missions little cargo was loaded and also missions were of a specific nature. Encircling on certain levels was not very demanding on the mainframes and only very little wear was noted on the mainframes and particularly the wings. The C-130H is so popular that you can hardly acquire second handed examples, especially because Lockheed also buys back respectable models. Seen in this light it was a gold discovery there in the desert. Marshall Aerospace was the best of the six companies bid on the open enrollment and transported the bodies by truck (!) and ship to Europe. Marshall Aerospace is in charge on maintenance for all RAF Hercules aircraft and was involved in adaptations in the cockpits of the British Tristar tanker / transport aircraft. Especially the knowledge on the latter job created much knowledge offered the basis for their concept. Everything on the first new Dutch Hercules was tested if it worked properly before delivery. Then it's up to the Air Force. The test and evaluation includes roughly three phases explains Mark. You start in phase 1 with the objective that the plane must be able to function if it was a commercial airliner. You can call it that the 'Herkybird' must be a bit schizophrenic so

to mention. In one way it should be able to perform equally to a 737, and the next moment it should also be able to perform in harsh conditions such as in the desert.

SAFETY FIRST !

Adjustments in the cabin were a core item to the RNLAf. They wanted to accept only the highest safety profile. Marshall provided the Hercules with a CSIMP modification (Cabin Safety Improvement Program). At the bottom of the floor glowing green stripes are assembled which lead to the door, in case of heavy smoke the way out can be found. In one of the two planes this supply had to be completely re-arranged. In the middle there is a ladder structure to be able to reach the escape hatches in the ceiling of the fuselage. This construction was also slightly improved. The side door is designed in a way that in several ways, both internally and externally it can be opened even if there is any degree of torsion, it's still working. In the phase one it was pure 'basics' and the Hercules flew from airport to airport, as in the civilian air traffic. All engines and the undercarriage were renewed which should be well tested.

NEW COCKPIT

The best battle was beaten with the cockpit innovation through the Cockpit Upgrade Program (CUP) modification! Although no cockpit of a Hercules is equal says Mark, this combination offers much more satisfactory and overview so a much easier operation is achieved by the new avionics, even considering that new avionics bring even more tasks in general. The "glass" cockpit is equipped with a Flight Management System (FMS) and auto pilot on Boeing 737 level. The system includes advanced navigation systems with both military and civilian GPS, SATCOM, and access to civil authorities for an Aircraft Communications Addressing and Reporting System (ACARS). The data link (which is not yet found in the current C-130H-30's currently in use) is the military Link-16 standard. There is an Automatic Flight Control System (AFCS), where the analog information of the digital motor is presented. The flight data is collected in the Digital Flight Data Recorder (DFDR). Juicy detail is that the Hercules normally get's one manual included, but that in this embodiment it has really become two. We must all learn to work with the new tools and a lot of software has to be loaded, even in this matter routine should occur.

SECOND AND THIRD PHASE

Once the device is acting as an exemplary airliner phase two is in sight. Now the tactical capability is looked upon, in other words, what is the system impact on your operations? Because the options are different from the two older C-130H-30's using more advanced equipment in the new ones the operational capabilities have to be surveyed and demands creativity on our part. Mark is referring to operational use in specific environments such as the RNLAf has seen Afghanistan or Iraq. Not only the plane could be exposed in such cases to heat but also very cold weather. Such environments can be found in Europe itself and testing will be thoroughly done including. When far in the north, the High Frequency (HF) radio is tested too for use over long distance. High humidity is also such a factor to deal with. What does it do to your 'glass cockpit' for example? Phase 3 is testing new things An example is the self-protection unit. A Missile Warning System picks up external signals and

subsequently flares can be fired. The boxes are the same type as used on the Apaches, Cougar and Chinook making it economical effective. There are also opportunities for electronic countermeasures. This allows you to work under a relatively high threat-level. This could be just the case because sometimes a Hercules is used when another device cannot be found, marking the all round capabilities of this aircraft. The aircraft earned thereby the nickname 'The Joker of the Air Force'. Whoever has difficulty to imagine this should be reminded with the fact that the biggest bomb over Afghanistan was ejected from an American Hercules.

FURTHER COURSE

In practice, people in general are not really overwhelmed for the C-130J yet. The aircraft is entirely digitally equipped with much composite material in its structure and that is new. Why are people so attached to that C-130H? A good reason for example is that it is expensive to operate two different types of the same aircraft. The two examples in the desert were modified on standard C-130H, because we already have two of them says Mark. To make it even more efficient, the two C-130H-30 will have the same CUP modification in the cockpit as the two new airplanes. The Dutch KDC-10 aircraft will also receive a CUP, which will look slightly different from the Hercules one. The O / E & MT process is actually performed for four aircraft. Obviously, the most tested one will be the G-988, the second copy will get a kind of "shake down" to break the dust from it. A script exists for the OT & E, but it will be guessing what will happen exactly during all the tests. Commissioning a sound and safe aircraft is the main goal, as Mark explains. Planning is secondary to that.

Deployment in a war zone, but also for humanitarian aid flights can be authorized only when in terms of safety, operational effectiveness and defined operational use everything is cleared from difficulties. The team will consult on a day-to-day basis and the Military Aviation Authority (MLA) looks over their shoulders. Results are collected and each flight has come to include new data via measuring devices of the Nationaal Lucht & Ruimtevaart Laboratorium (NLR). Next to this, the technical service and maintenance personnel also have to learn all ins and outs and make them their own. The sort of spare parts will be made with Marshall Supports special calculation programs. So there is still work to do, and although Mark is definitely not making a decision about when estimated time of operational position to employ will be. Mark and his people are doing well to check if the plane does what he must do and the RNLAf can be happy with that fact because a Hercules with the image to be very safe and useful is a real asset.

PART 2 - NEW NAMES

Following the O/MT & E-process which is going to finals, recently on November 19th a ceremony was held to provide both new C-130H's with a name. Lieutenant-General Jac. Jansen, the commander of the RNLAf was to reveal both names together with direct relatives of the name-givers, under the watchful eyes of both military and civil authorities on the Eindhoven air base where the C-130H's are located.

The RNLAf pays attention to its own past, the name-givers all have a very meritorious and even illustrious past. Both 'Willem den Toom' and 'Bob van der Stok'

did have careers in the Air Force and were captured in WW-II and taken as POW (prisoner of war) and placed in German concentration camps. Though they survived these camps. Willem den Toom was amongst others Secretary of State of Defense, later on Minister of Defense in his extensive career. Bob van der Stolk was a fighter pilot, who shot down a German Messerschmidt 109 with his Fokker XXI, and damaged another German plane. During the war he also served in the 41 squadron of the Royal Air Force and flew the Spitfire. He was one of the three that survived an escape out of camp 'Stalag Luft 111 near Breslau. This escape is known by book and film as 'The Great Escape'.

Both aircraft 'Bob van der Stolk' and 'Willem den Toom' are by now fully operational (nov-2010) in the RNLAf and we will meet them surely.

C-130H HERCULES IN SHORT

Length:	29.8 m
Width:	40.41m
Height:	11.61m
Engines:	4 x Allison T56-A-15LFE
Power:	4.591 pk per engine
Empty weight:	40.000 kg.
Maximum weight:	70.455 kg.
Cruise speed:	556 km/u
Maximum speed:	602 km/u
Range:	± 8100 km.

MARSHALL MODIFICATION/MODULES

Mod Ma CSIMP	(improvement safety cabin)
Mod Ma CUP	(New cockpit)
Mod Ma Recovery	(transport out of the desert)
Mod Ma Package B	(C-130H standard)
Mod Ma SPS	(self protection)
Mod Ma Nav/Data Converter	(Avionics)
Mod Ma Flight Director Converter	(Avionics)
Mod Ma Autopilot Mode Selector	(Avionics)

Kees Otten & Wim Das