CH-53 ALS 'LONG SURVIVOR'

A view on Rheine Bentlage's CH-53 - 40 years exsistance of MTHR-15

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Rheine Bentlage had its own jubilee on July 1st, 2011. An 'Open House' was organized on behalf of the 40 years existence of the 'Mittlerer Transport Hubschrauber Regiment 15' (MTHR-15) of the 'Heeresflieger'. For many years now the German Army fly the Sikorsky CH-53, being the only European user of this impressing transport helicopter. This Jubilee provides a good opportunity to zoom in on this CH-53 and have a view on details.

TACTICAL GIANT

The CH-53 is the largest transport helicopter in Western aviation, and in the world only exceeded in size and capacity by the Russian Mil Mi-6 and Mi-26. The Germany of the 'Cold-War' times really saw it well. In 1966 they were facing a need to deploy a large helicopter in the field for transport large numbers of troops, jeeps, armored cars and anti-aircraft artillery under the fuselage. At certain moment there even was a competition with the 'Chinook' but the CH-53 finally was judged as best suitable. Finally112 examples were ordered including two directly from the Sikorsky production-line, and a further 110 license built by VFW-Fokker in Speyer. A first batch of 20 examples, were constructed with parts out of the United States and in later production examples about 50% of European parts were used. These parts came amongst others from MBB-Werke, Dornier and Henschel Flugzeugwerken. From 1971 the introduction was followed by several test-phases, and in between 1973-1975 the CH-53 was taken into service with the designation CH-53G. This version was quite identical to the CH-53D, in that time in service with the United States marines (Sea Stallion).

The German Army flies these machines with a standard crew of two pilots, one crew chief and one aerial observer. The CH-53 is suitable to carry 38 soldiers or 24 stretchers and it has a semi-monocoque fuselage of aluminium, steel and titanium with a firm tail which is equipped with a loading-hatch. Inside the fuselage two light armored cars can be transported of the Wiesel type, 105 artillery guns or a HAWK 'Flak'. (Comical often named 'Ack-ack'. 3600 kg cargo can be transported inside the fuselage, and up to 5900 kg on a sling under the fuselage. There are three independent working hydraulic systems for control, and the rotor head partly exists out of titanium, with six foldable rotor blades. The landing gear is retractile. On both sides of the fuselage there are two so called sponsons, as big as needed and also hosting two fuel-tanks.

‘OUT OF AEREA’ OPERATIONS

The many years of flying caused damage, wear on the mainframes but also avionics and equipment were no longer up-to-date to modern standards as was considered at

certain point, this also because requests were received for operational deployment in IFOR (Bosnia) and KFOR (Kosovo) operations. Several update programs were running, resulting in three batches spread over several years. All these updates were contracted with Eurocopter Germany in Donauwörth. Only minor differences appeared in the three batches and all engines received a by MTU Aero Engines executed upgrade of the T-64-GE-7 to the stronger T64-100 engines which perform better under 'hot & high' circumstances. The helicopters were made suitable for flying under IFR conditions. At the end of the nineties 20 examples were converted to CH-53GS (German Special) of which the first prototype flew in 1996.

This upgrade was a modernization of communications and navigation equipment and ECM equipment. Indicated as 'Elektronische Kampfführung' (EloKa, which means electronic warfare) and suitable for 'special operations' an Elisra SPS-65 (V) Radar Warning Receiver (RWR), a Lockheed-Martin (Loral) AN/AAR-47 Missile Approach Warning System (MAWS) and a Rokar ADDS Chaff/Flare dispenser against infra-red guided missiles were mounted. Other changes in avionics were the installation of a Nap-of-the-Earth Terrain following flight capability (NOE-TF), GPS, and the capability of the cockpit for the use of night-vision goggles. These features were off course installed with the aim to fly low-level missions by night. The mainframes were checked and strengthened at parts where necessary and Sikorsky delivered an E-kit Range Extension with two external fuel-tanks which increased the range from a 1000 km to 1800 km in total, loaded with 36 armored soldiers.

When Germany was asked to support the ISAF mission in Afghanistan six extra CH-53G's were converted to a newer version, at first called CH-53GSX and later on changed in the designation CH-53GE. Actually it differs very little of the CH-53GS. Here also the EloKa principle was applied. The helicopters engines were equipped with special dust-filters, called 'Engine Air Particle Seperators (EAPS) enabling the type to be used in Afghanistan in the CSAR role. The two 7.62 mm MG-3 machineguns on the side-doors were replaced by 12.7 mm M3M machineguns and a third one was mounted on the back- near the hatch in a suspension with 'red dot' sight and type of NVG compatible directed sight-and-aim equipment. This modification was later also mounted on the CH-53G. Operating under ISAF's Regional Command North missions were flown with airmobile troops, and also medevac missions, freight and special operations.

CONNECTION TO NH-90

The next upgrade was recently under progress when 40 selected CH-53G (with the best mainframe status) were converted to CH-53GA where the A stands for Advanced. Once again it comes to an EloKa version but now with a new flight deck, new autopilot with four axes, FLIR, ECM and provision for additional internal fuel capacity. The main subcontractors are Rockwell Collins (Avionics), EADS (self defense products), Sagem (autopilot) and Rohde & Schwarz (communication equipment). The avionics are based on the Rockwell Collins Flight-2 architecture combined with five multifunction color displays and flight management computer (FMC), full Night Vision Goggles compatible cockpit, new digital folder, IFF Mode 4

transponders and the possibility to connect the Link-16 data link in future such as yet is the case on the NH-90.

The self-defense mechanism is similar to the CH-53GS of which the Missile Launch Detector System (MILDS) is even more competent. The extra internal fuel tanks Guardian Robert expand the range to 1200 km. but to the detriment of the load.
The CH-53GA is thus be more self-sufficient and can even serve as a tanker for other helicopters to forward bases. New is the use of mobile workstations in the cargo area to make it possible for extra people to operate the sensors. The first flight was in 2010 and the helicopter was seen at ILA 2010 in Berlin.

The latter will be employed in 2014 and then the life extension will be upgraded to 6000-10000 hours, the CH-53GA will be employed to 2030 in addition to operate next to the NH-90. Until 2014 work will continue on a total of 80 pieces. Yet a major achievement for this helicopter after being in active service for so many years in such numbers and now featuring unique upgrades. What really counts is the increased ability out of a larger spectrum of missions which reflects the demanding needs of today's more complicated warfare. Even better is that a sophisticated interaction will be possible with the NH-90 of which the capacities only can be matched by the most modern Dutch and British Chinooks. The MTHR-15 at Bentlage will play the leading role in this matter.

CH-53G in short:

Length:	20.47m
Length with rotor	30.18m
Height	7.59m
Rotordiameter	22.02m
Rotor disc area	380.8 vierkante meter
Rotorblades	6
Engines	2 x General Electric T64-GE-7 of 2.890 KW each were replaced by 2 x General Electric T64-GE-100 of 3.229 KW each
Max. speed	295 km/u
Cruise speed	about 250 km/u
Max. rate of climb	660 m/min
Ceiling	5.639m
Empty weight	12.650 kg. (GS versie: 11.790 kg.)
Max. start weight	19.050 kg.
Load	Internal 3.600 kg (GS version: 4.600 kg) Under fuselage: 9000 kg.
Fuel	7255 L.
Reach	About 880 km. (depending on load)

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