

Apache and Chinook - Rotary Wing Capability Boost

Air Marshal Anil Chopra, PVSM, AVSM, VM, VSM (Retd)[®]

Abstract

Indian Air Force (IAF) and Indian Army (IA) will soon have formidable attack helicopter capability and will use for Suppression of Enemy Air Defences (SEAD) / Destruction of Enemy Air Defences (DEAD), Counter Air, Interdiction at varying depths inside enemy territory, Combat Search and Rescue (CSAR), etc. in furtherance of both air and ground battles. It would act as a tremendous force-multiplier at the point of decision, when required. Indigenous helicopters have taken reasonable shape but are held up due to delayed decision on weapons. Addition of the Chinook, Apache, the Rudra and MH 60 Romeo Seahawk helicopters will give a massive boost to the capability. Rotary wing fleet will continue to remain a very significant fleet both, in war and peace.

Introduction

In a major capability boost for the IAF, the Boeing Company delivered four AH-64E Apache attack helicopters on 27 July 2019, ahead of the contracted schedule, at the Hindan Air Force Station, outside Delhi. Four more Apache helicopters arrived in early August 2019. The eight then moved to Pathankot Air Force Station for their formal induction in September 2019. By next year, the IAF will operate a fleet of 22 Apache helicopters. Selected air and ground crew have undergone training at the training facilities at US Army base Fort Rucker, Alabama.¹ The Apache will be a significant boost to IAF's combat capability. The helicopter is customised for IAF's future requirements and the aircraft has significant capability in the mountains. The two pilot Apache is considered a "game changer" in the tactical battle scenario. The helicopter will carry precision lethal attacks at standoff ranges with

[®]**Air Marshal Anil Chopra, PVSM, AVSM, VM, VSM (Retd)** is a former Air Officer-in-Charge Personnel. He also served as a member of Armed Forces Tribunal after retirement from Service.

Journal of the United Service Institution of India, Vol. CXLIX, No. 617, July-September 2019.

networked weapon systems. The Indian government had placed an order for 22 AH-64E Apache helicopters as a part of a \$ 1.4 bn deal that was signed in September 2015. Apache will be based at Pathankot and Jorhat.

On 25 March 2019, IAF formally inducted four out of the 15 contracted Boeing Chinook CH-47F (I) heavy-lift helicopters at their home base, Air Force Station, Chandigarh. Two more came in early July 2019. Air Chief Marshal BS Dhanoa, PVSM, AVSM, YSM, VM, ADC, hailed the induction, saying that it was a national asset and these will boost India's security through increased vertical lift capability. The US \$ 1.5 billion Chinook contract included India specific enhancements. The second helicopter unit of heavy-lift choppers will be created in the East in Dinjan (Assam). Chinook can deliver heavy payloads to high altitudes and is eminently suited for operations in the high Himalayas. It will greatly enhance India's capabilities across a range of military and Humanitarian Assistance and Disaster Relief (HADR) missions. Chinook serves armed forces of 19 countries.

Helicopter Operational Roles

Helicopter today has many civil roles including transportation, cargo, construction, fire-fighting, tourism, air ambulance, law enforcement, agriculture, news and media, and aerial observation, among others. Military transport helicopters are used to transport personnel (troops) and cargo in support of military operations. The larger helicopters like Mil Mi-26 can carry 90 troops or 20,000 kg cargo.² Boeing CH-47 Chinook can carry 55 troops or 10,886 Kg cargo.³ These can also carry large under-slung loads. The personnel and cargo can be picked and dropped at unprepared locations. These helicopters are also used for air assault to move assault force from assembly areas to Landing Zone (LZ) or Drop Zone (DZ).

Attack helicopters, often referred to as 'Gunships', are designed with capability of engaging targets on the ground such as armour vehicles, enemy infantry and light vehicle convoys. They can quickly provide direct and accurate close air support (CAS) for ground forces, including against armour concentrations. They could also attack static targets close to the Forward Edge of Battle Area (FEBA) such as radars. Attack helicopters could be used as air support escorts in a heliborne operation or for CSAR. They could also be used in the armed scout role. They are armed

with guns, rockets and air-to-ground missiles. Many attack helicopters are also capable of carrying air-to-air missiles, primarily for self-defence. Attack helicopters are designed with narrow fuselage, tandem seating, high external visibility and have high manoeuvrability. They take on anti-tank, anti-helicopter, anti-UAV and close air support (CAS) roles. Guns and important sensors are chin-mounted. Rockets and missiles are carried on stub wings. They are normally equipped with short range radar and Forward Looking Infra-Red (FLIR) sensors. They have laser rangefinder and laser target designator. Many gunships can also carry a few troops.

Observation helicopters are used to monitor the battle in Tactical Battle Area (TBA). The observation could be visual by the aircrew or using an optical sensor like low-light level television (LLLTV) or FLIR camera. These helicopters also assist targeting by artillery fire and airstrikes. They can also do laser illumination for laser-guided bombs (LGBs) and other weapons fired by mother or other armed aircraft.

Maritime helicopter tasks include observation duties; inter-ship movements; and also for recovery of pilots who may have ditched, or sailors fallen overboard. Special tasks include anti-submarine warfare role and dropping air-launched torpedoes and depth chargers. Integral dunking sonar, radar and magnetic anomaly detectors help better response to submarine threats. Multi-role maritime helicopters nowadays operate nearly autonomously in the Anti-submarine warfare (ASW), anti-shipping, transport, Search and Rescue (SAR) and reconnaissance roles. Helicopters form an important anti-submarine strength of an aircraft carrier. SAR and medical evacuation remain key roles for helicopters. A similar mission from behind enemy lines would be a CSAR.

Mil Mi-25 and Mi-35

The Russian Mi-24 'Hind' was essentially a large attack helicopter.⁴ Also referred to as the 'flying tank', they were operated since 1972 by the Soviet/Russian Air Force and more than 60 other nations. The export variant was the Mi-25 and later upgraded Mi-35. The airframe is streamlined and fitted with retractable landing gear to reduce drag. At high speed, the stub-wings provide considerable lift. The helicopter has a maximum speed of 335 km/h and service ceiling of 4,900 m. It has removable armour plating around the

cockpit and below the cabin and can carry eight troops or four stretchers. It has integral gun and window mounted machine guns. Total payload is 1,500 kg of external stores which include the Shturm anti-tank missile. Aircraft has seen extensive action in Afghanistan and in many other wars. After Balakot, India made Rs 200 crore emergency purchase of 'Strum Ataka' anti-tank missiles for Mi-35s.⁵ IAF's two squadrons of Mi-25/35 will gradually be replaced by Apache.

Hindustan Aeronautics Limited (HAL) Rudra ALH-WSI⁶

HAL 'Rudra' is the armed version of HAL's Advanced Light Helicopter (ALH) 'Dhruv'. It has integrated sensors, weapons and electronic warfare suite, and uses an upgraded version of the glass cockpit used in the HAL Dhruv Mk-III. The avionics suite integrates a global positioning system (GPS), FLIR, HF/UHF communications radio, Identify Friend or Foe (IFF) system, Doppler navigation and a radio altimeter. The electro-optic pod, helmet-mounted sight and fixed sights ensure that the pilots can accurately engage targets using on-board weapons. The sensors include stabilised day and night cameras, infrared imaging as well as laser ranging and designation. It has an Integrated Defensive Aids Suite (IDAS) from SAAB (Sweden), with electronic warfare self-protection, which is fully integrated into the glass cockpit. Mark IV is meant to have a French Nexter 20 mm turret gun, Belgian 70 mm rockets, MBDA air-to-air and air-to-ground missiles and the indigenous Helina (Helicopter-launched Nag) anti-tank missile. The two crew helicopter is powered by two HAL/Turbomeca 'Shakti' turbo-shaft engines and can carry 12 passengers or 4 stretchers. Useful maximum load is 2,600 kg and maximum speed 290 km/h. The service ceiling is 6,096 m. HAL handed over the first Rudra to IA in 2013. The current total order is for 76 Rudra Mk IV (60 for IA and 16 for IAF). Indian Navy (IN) is keen to order at least 20 helicopters for coastal security.

Light Combat Helicopter⁷ (LCH)

The LCH is an indigenous multirole combat aircraft under development by HAL. It will have capability to operate at high-altitudes. The tandem seat LCH drew extensively from the ALH Dhruv. On 29 March 2010, LCH prototype did its maiden flight. LCH also became the first attack helicopter to land in Siachen. Ever since, it has repeatedly landed at helipads up to 15,800 feet.

On 26 August 2017, full-rate production of the LCH was started. IA has ordered 114 and IAF 65 LCH. LCH also has a data-link for network centric operations. Along with Israel, HAL is developing a FLIR. LCH will have the M621 cannon. Up to four missiles can be carried including the Helina and MBDA Mistral 2. On 17 January 2019, LCH completed weapons trials with the successful firing of Mistral-2 air-to-air missile at a flying target. Payloads of rockets can also be carried. Initial Operational Clearance (IOC) is expected later in 2019.

Boeing AH-64 Apache Longbow⁸

AH-64 Apache is a stealth versatile machine, designed for all kinds of missions. It comes equipped with laser and infrared systems for day-night operations and armed with air-to-surface Hellfire missiles, 70 mm rockets and automatic cannon. Apache has a twin turbo-shaft engine with a tail wheel-type landing gear and a tandem two-crew cockpit. It has a nose-mounted sensor suite for target acquisition and night vision system. It is armed with a 30 mm M230 chain gun and has four hard-points on stub-wing pylons for armament and stores. Typically, it can carry a mixture of AGM-114 Hellfire missiles and Hydra 70 rocket pods. The AH-64 has large amount of systems redundancy to improve combat survivability. The prototype YAH-64 first flew in September 1975. The helicopter was inducted into the US Army in April 1986. The first production AH-64D Apache Longbow, an upgraded Apache variant, was delivered to the US Army in March 1997. Over 2,000 AH-64s have been produced.

The crew compartment has shielding between the cockpits, such that at least one crew member can survive hits. The compartment and the rotor blades are designed to sustain a hit from 23 mm rounds. The airframe has armour protection and has self-sealing fuel system. It has a maximum service ceiling of 6,400 m and maximum speed of 365 km/h. The state-of-the-art integrated avionics include an extended range radar. The Ground Fire Acquisition System (GFAS) detects and targets ground-based weapon fire sources. High-resolution colour imagery is provided to the crew. Weapons include the Stinger air-to-air missiles, the AGM-122 Sidarm anti-radiation missile and the MBDA Brimstone anti-armour missile. The AH-64E Apache has the ability to control unmanned aerial vehicles (UAVs), to perform aerial scouting

missions. Boeing has suggested that the AH-64 could be fitted with a directed energy weapon (small laser weapon), initially designed to engage small UAVs. The updated Longbow mast mounted active electronically scanned array (AESA) radar has an over sea capacity, potentially enabling naval strikes. Apache has seen extensive operational deployment in Iraq and Afghanistan.

Boeing CH-47F (I) Chinook

Chinook is a twin-engine, tandem rotor, heavy-lift helicopter, original variant of which first flew in 1962. The Chinook possesses several means of loading various cargoes, including multiple doors across the fuselage, a wide loading ramp located at the rear of the fuselage and a total of three external ventral cargo hooks to carry under-slung loads. Its top speed is 315 km/h. IAF variant has upgraded engines, composite rotor blades, a redesigned cockpit, modern avionics, advanced digital flight control system, and lower maintenance requirement. Maximum payload is 24,000 lb (10,886 kg) or 33–55 troops and maximum range is 740 km. Its maximum flight altitude is 6,100 m. Aircraft has taken part in most major operations since Vietnam War.

Helicopters in Counter Insurgency Role

Helicopter's versatility is a big asset for use in counter insurgency role. IAF's helicopters are deployed in 'Op Triveni' against Maoist insurgency. Day and night operations include aerial surveillance, infiltration/exfiltration of ground forces, maintaining crucial operational supply line, ambulance operations and casualty evacuation. The helicopters are armed for self-defence and have clearance to fire in case the helicopter is attacked. In Jammu and Kashmir (J and K) IA uses helicopters for surveillance of possible infiltration points while IAF supports quick reinforcements. Helicopters can be used to pursue militants and help ground forces to join up with them. They are often mounted with search lights and thermal sensors for night pursuits. The slow moving helicopter faces risk from ground fire, especially man-portable short range ground-to-air missiles.

HADR Operations

The largest single non-combat helicopter operation in history was the disaster management operation following the 1986 Chernobyl nuclear disaster involving airdrops. Use of helicopters to control wild-fires using heli-buckets is routine nowadays. The helicopter

fleets are engaged round-the-year for HADR missions. In India, parts of J&K are cut-off every winter during heavy snow-fall. IAF sets up air-bridge to move stranded men and materials. IAF and IA fly around the year to sustain troops and civilians in the Siachen glacier and elsewhere in J&K and North east. Similarly they are used during cyclones and floods. Helicopters also rescue skiers during landslides. IAF's role in the relatively inaccessible mountainous terrain, as was the case during Uttarakhand floods of 2013, or Sikkim earthquake was crucial and time-critical. IAF was the first to reach Nepal during the massive 2015 earthquake and helicopters went village hopping pulling-out survivors. Helicopters crew are proud that invariably they are the 'first to enter and the last to leave'.

Helicopters in Indian Sub-Continent

Attack helicopters in India have been operated by the IAF under combat tasking by IA. IAF has its own attack helicopter related tasks, such as interdiction, armed recce, radar bursting, CSAR, front-tier airfield attack etc. It has been decided that in due course IA will have its own attack helicopters. Indian armed forces have inducted the ALH and its weaponised version 'Rudra'. Over 240 ALH variants have been produced till date. These aircraft have night vision goggles (NVG) compatible cockpit. IAF has a fleet of 240 Mil Mi-8, Mi-17, Mi-17 1V and Mi-17V 5 medium lift utility helicopters. IAF currently has three Mil Mi-26 heavy lift helicopters and they are due for overhaul. Chinooks have been inducted. The HAL Chetak and Cheetah are light utility helicopters operated by all the three Services and Coast Guard. India awaits signing of Kamov Ka 226 T contract. 200 of which are planned to be produced in India jointly by Kamov and HAL. Indian Navy operates the Kamov-31 for airborne early warning, Sea King, Ka-25, Ka-28 and Dhruv in anti-submarine role. So are Westland Sea King and Sikorsky Sea King. Seventeen of the Sea King helicopters will be upgraded with night capability and integration of two anti-ship missiles and new radar. 16 Multi-role S-70B Seahawk helicopters have been selected to replace Westland Sea King. Defence ministry has approved the procurement of 10 Kamov Ka-31 Airborne Early Warning and Control helicopters for the Indian Navy at a cost of around Rs 3,600 crore. They will be deployed on the aircraft carriers and other warships. US has approved sale of 24 MH 60 Romeo Seahawk helicopters to India for \$2.4 bn. India has been

in need of these formidable anti-submarine hunter helicopters for more than a decade now.

China's People's Liberation Army Air Force (PLAAF)⁹ operates Changhe Z-8, Z-9, and Z-11 which were supported by Eurocopter and are built under license. They also have medium lift Z-18, Z-19, Z-20, Mi-8/Mi-17, and Eurocopter AS332 Super Puma helicopters. WZ-10 and the smaller Z-19 attack helicopters are under advanced stage of development. Pakistan operates 45 Mi-17 helicopters, a few which have been transferred by China. They also have around 100 Aerospatiale Alouette III light helicopters, a few assembled locally. Pakistan received the four Mi-35M heavy attack helicopters ordered from Russia in 2015. They are interested in 20 more.

IAF Helicopter Operation

IAF Mi-4 helicopters were used for Heli-borne operation in the 1971 Bangladesh war. Siachen Glacier is the highest battlefield in the world with posts at heights up to 23,000 feet. IAF's Mi-8/17 and Cheetah helicopters airlifted hundreds of Indian troops to Siachen in 1984, and till date continue to support them. In 1987, for Operation Pawan of Indian Peace Keeping Force (IPKF) in Sri Lanka, about 70,000 sorties were flown by the IAF's transport and helicopter force without a single aircraft lost or mission aborted. Mi-8s supported the ground forces and also provided air transportation to the Sri Lankan civil administration. Mi-25s provided suppressive fire against militant strong points and to interdict coastal and clandestine riverine traffic. In the 1999 Kargil Conflict, IAF provided close air support using helicopters. While on an offensive sortie, a Mi-17 was shot down by three Stinger missiles and lost its entire crew of four. Helicopters thereafter were used only in operational logistic and communication missions. IAF has regularly contributed helicopters to UN Peace keeping force. Indian armed forces will shortly have an upgraded inventory of helicopters to undertake various roles. This would be a great force multiplier. Rotary wing fleet will continue to remain a very significant fleet both in war and peace.

Endnotes

¹ <http://www.pib.nic.in/PressReleasePage.aspx?PRID=1571884> accessed on 10 Aug 2019.

² <https://www.globalsecurity.org/military/world/russia/mi-26.htm> accessed on 10 Aug 2019.

³ <https://www.boeing.com/history/products/ch47-chinook.page> accessed on 10 Aug 2019.

⁴ <https://fas.org/man/dod-101/sys/ac/row/mi-24.htm> accessed on 12 Aug 2019.

⁵ <https://economictimes.indiatimes.com/news/defence/india-signs-rs-200-crore-anti-tank-missile-deal-with-russia/articleshow/70019412.cms?from=mdr> accessed on 12 Aug 2019.

⁶ https://www.militaryfactory.com/aircraft/detail.asp?aircraft_id=1943 accessed on 14 Aug 2019.

⁷ https://hal-india.co.in/Product_Details.aspx?Mkey=54&IKey= &CKey=63 accessed on 16 Aug 2019.

⁸ <https://www.indiatoday.in/mail-today/story/boeing-made-ah-64e-apache-attack-helicopters-to-join-iaf-fleet-in-19-1298619-2018-07-28> accessed on 18 Aug 2019.

⁹ <https://www.vifindia.org/sites/default/files/growing-muscle-of-plaaf.pdf> accessed on 20 Aug 2019.