Howitzers and Seven New Regiments: Indian Army's Game Changer in Mountainous Terrain

P K Chakravorty

The words of former United States Secretary of State Hillary Clinton at the India Today Conclave held at Mumbai on March 10, 2018 were, indeed, music for the Indian ears. She referred to India as a country which is accepted as a power that counts by both political parties across the United States.[1] This has been possible due to the robustness of the Indian economy and its armed forces. 'Make in India' has been a flagship project of the current government and the Regiment of Artillery has left no stone unturned to modernise, with emphasis on 'Make in India'.

Modernisation of the Indian Amy is being undertaken to meet the two-front threats from China and Pakistan. For this, the focus is on Network-Centric Warfare (NCW). Like other combat arms, the Indian Artillery is currently in an NCW environment and has to provide surveillance and reconnaissance, resulting in target acquisition which would lead to engagement which needs to be monitored to undertake post strike damage assessment and ensure that the target has been destroyed. In NCW, the artillery shapes the battlefield, degrades the enemy's war-

Major General **PK Chakravorty** (Retd) is Senior Fellow (Veteran) Centre for Land Warfare Studies, New Delhi.

waging capability, destroys his field defences, communication sites, and logistics echelons, thereby paralysing him and, thus, accomplishing own mission. Along with the 'Make in India' projects, the artillery has been at the forefront of modernising its inventory with state-of-the-art equipment. The acquisition of the 155 mm M777 ultra-light howitzers falls in this category. Prior to getting into the details of the current acquisitions, it would be pertinent to understand the artillery's profile and modernisation aspects.

Profile and Modernisation

The role of the artillery is to destroy/neutralise/suppress the enemy by synergised and orchestrated application of all fire assets at selected, decisive points to physically and psychologically degrade enemy cohesion with the ultimate aim of breaking his will to fight.[2] It is an arm which can attack the Centres of Gravity (CoGs) which impacts the fighting capability of an organisation. To undertake the task, the artillery profile is based on guns, rockets, missiles and surveillance and target acquisition equipment. The artillery's profile would be based on the operational requirements of the Indian Army, catering for threats, in conjunction with the terrain. With regard to guns, it would be to enhance the calibre, and give the Indian Artillery a 155 mm (52 calibre) as the basic gun, replacing the existing 105 mm and 122 mm field guns. This would provide enhanced range and greater throw off at the target end. There would be other variations which would comprise the 155 mm self-propelled track regiments for the armoured divisions in desert terrain, 155 mm self-propelled wheeled howitzer for the mechanised forces in riverine terrain, 155 mm mounted gun system for the same force to operate in semi-desert terrain and the 155 mm ultra-light howitzer for operating in mountains as also out of area contingencies. This ultra-light howitzer is extremely important due to its capability of being lifted by a helicopter and would be a game changer in the mountains.[3]

In addition, there would be light regiments of 120 mm mortars with greater range and capability to move or be mule packed, based on the requirements of the terrain. Further, the rocket regiments would be a mix of GRAD, Pinaka and Smerch regiments. There would be regiments equipped with the supersonic cruise missile, the BrahMos, which would be configured for all types of terrain.

Surveillance forms a major component of the Regiment of artillery. The artillery needs to provide surveillance cover to formations operating all over the country. The Surveillance and Target Acquisition (SATA) regiments would be scaled at the corps level and SATA batteries at the division level. The surveillance philosophy will guide the future sensor profile of these regiments. The surveillance will focus on battle-field transparency, with emphasis on the depth battle. Further, it must be disseminated in near real-time. The essential surveillance equipment would be as given below:

- Thermal imaging integrated observation equipment.
- Long range reconnaissance and observation equipment.
- Battlefield surveillance radar, medium range, long range and short range.
- Weapon locating radars.
- Sound ranging system.
- Unmanned Aerial Vehicles (UAVs).

The Artillery profile has been planned up to 2027 which would be the culminating year of the 14th Five-Year Plan. It would enable the Regiment to build its capabilities systematically over a deliberate period. The Indian Artillery is currently in a Network Centric Warfare (NCW) Environment has to provide Surveillance and Reconnaissance resulting in Target Acquisition which would lead to engagement which needs to be monitored to undertake Post Strike Damage Assessment and ensure that the target is destroyed. In NCW, Artillery shapes the battle field,

degrades enemy's war waging capability, destroys his field defences, communication sites, logistics echelons thereby paralysing him and thus accomplishing our mission.

The regiment of artillery is currently equipped with a variety of surveillance devices, guns, mortars, rockets and missiles. The surveillance devices are a part of the SATA Regiments. The devices currently held comprise the UAVs which are of four types. These are the Medium Altitude Long Endurance (MALE), Heron UAV and short range UAVs Searcher MK I, Searcher Mk II, as also four indigenously built Nishant. These UAVs have been operationally optimised and they are an extremely useful tool of surveillance. Our current holdings are minimal and their numbers need to be enhanced. The Defence Research and Development Organisation (DRDO) is currently developing a MALE UAV – Rustam – which will possibly be inducted in the short term.

The SATA units are currently equipped with Medium Range Battlefield Surveillance Radars (MBFSR) and Weapon Locating Radars (WLRs). The MBFSRs currently held are the ELM 2140 which are able to detect tanks, vehicles and troops. They are held in minimal quantities and been exploited by mobile masts. The WLRs currently held are the ANTPQ-37 which have been optimised with a reasonable degree of success. Further, the SATA units are equipped with the Long Range Reconnaissance and Observation System (LORROS). This equipment has excellent day and night surveillance capability and has proved its effectiveness in operational areas. The SATA units also have a passive weapon locating system known as sound ranging. The system currently held is old and needs to be replaced by state-of-the-art equipment. Bharat Electronics, in conjunction with the Defence Research and Development Organisation (DRDO) has developed a WLR which has successfully undergone evaluation trials and is currently being inducted in the plains.

As regards guns, the regiment is equipped with field, medium, self-propelled, light and medium regiments. The field regiments possess

either the 105 mm Indian field gun/light field gun or 122 mm field howitzer. The medium regiments possess 130 mm medium gun, 155 mm Bofors medium gun (39 calibre) and a few regiments of Soltam guns. The self-propelled regiments are equipped with the 130 mm catapult and the light regiments are equipped with 120 mm mortars. There is also a heavy mortar regiment equipped with 160 mm mortars. The Regiment of Artillery is holding rockets and missiles. The rocket regiments are equipped with 122 mm GRAD BM-21 rockets, 214 mm Pinaka rockets and 300 mm Smerch rockets. The missile regiments are equipped with the supersonic cruise missile BrahMos, which has a range of 290 km.

Apart from this, the regiment holds a variety of ammunition to include high explosive, smoke, illuminating, cargo, Kransopol Precision Guided Munition (PGM), terminally guided sub-munition and fuel air explosives. While our surveillance equipment, rockets and missiles are modern, our guns and ammunition are reaching obsolescence and need to be replaced at the earliest. The regiment has started the process of inducting the Artillery Combat Command and Control System for state-of-the-art communications between the observation posts and guns.

The Ultra Light Howitzer (ULH)

In an artillery seminar held in 2010, the speakers stated that it is likely that the next war to be fought by India would be in the mountains. In the mountains, with limited space for manoeuvre, firepower would play a decisive role. Artillery is the predominant proponent for firepower in the mountains.[4] Currently, the field and medium artillery held in the mountains is incapable of being heli-lifted, and mobility is purely confined to movements by road. The 155 mm Ultra Light Howitzer (ULH) would provide this capability to be lifted by the proposed CH 47 Chinook helicopters to be acquired by the Indian Air Force (IAF).

The 155 mm ULH is an operationally tested medium gun that has been used in the following operations:

- Afghanistan.
- Iraq.
- Syrian Civil War.
- Yemen Civil War.[5]

The ULH replaced the M198 howitzer in the US Marine Corps and the US Army in 2005. It is also used by the land forces of Australia, Saudi Arabia and Canada. The ULH is manufactured by BAE Systems. The weapon is partially manufactured in the United Kingdom (UK) and its integration as also testing is undertaken at Hattiesburg in the US. Initially, the ULH was developed by Vickers Shipbuilding and Engineering armaments division in Barrow, the Furness, UK. The company was then purchased by BAE Systems. The howitzer is 41 percent lighter than the US medium gun M 198 howitzer. It weighs 4,200 kg or 9,300 lb. This is facilitated by the extensive use of titanium.[6] The ULH has the capability of firing the M 982 Excalibur Global Positioning System (GPS)-guided ammunition. In June 2012, the ULH fired on the insurgents in Afghanistan in the Helmand province at a range of 36 km. The rounds landed within a Circular Error of Probability (CEP) of 5 metres.[7] The ULH is capable of firing all 155 mm ammunition manufactured in India. It is extremely versatile and can be transported underslung by helicopter, as also by transport aircraft like the C 130 and IL 76. It can be towed easily by a common gun tower of the artillery. The ULH has been trial evaluated by the Indian Army both in the plains and at high altitude, enabling understanding of its systems and maintenance.

The Indian government gave the final nod in October 2016 and a contract for nearly Rs 5,000 crore for 145 ULHs was signed on November 30, 2016. This was a historic moment as it opened the doors to procurement of modern artillery systems. In order to generate range tables, two ULHs were handed over to the Indian Army on May 18, 2017. It is reported that 25 ULHs will come to India in fly away

condition while the rest will be manufactured in India by BAE Systems in partnership with Mahindra Defence.[8] This would enable the weapons to be *Made in India*. It is reported that even the barrel would be eventually manufactured in India. The $ 737 million contract has an offset clause of around $ 200 million which would be executed separately. The firing for the range tables with 155 mm Indian ammunition has begun in right earnest at Pokhran. On September 02, 2017, there was a barrel burst which is being investigated by a joint team. The range table's compilation is continuing smoothly and the howitzers will be inducted on schedule.[9]

Game Changer in Mountainous Terrain

Napoleon once stated that "God fights on the side with the best artillery." The Indian Artillery needs to be modernised as soon as possible.[10] Artillery plays a pivotal role in the mountains. This was demonstrated clearly during the Kargil conflict in 1999. The current deployment of the Indian Artillery in mountainous terrain is based on the priorities for fighting a successful defensive battle. Future operations in the mountains and at high altitudes would be short swift and entail offensive action. These would be undertaken by reserve formations as also the mountain strike corps. For such operations to be successful, sidestepping and shifting of artillery resources would be necessary. This entails movement by roads with steep gradients, which is time consuming. Further, heliborne and airborne operations are also being visualised. In such a scenario, the 155 mm ULH, which is capable of being heli-lifted and air transported, could be smoothly used to deploy, fire and move. Howitzers could be moved from one sector to another, be it in the north or the east as per the required situation. Offensive action could be easily undertaken with the firepower of the ULH.

Hypothetically, let us assume that 60 percent of the ULHs are deployed in the Eastern Theatre and the remaining 40 percent in the Northern Theatre. Within the theatre, as also outside the theatre, these

ULHs could be easily redeployed to produce the required firepower. It is important to note that due to lack of roads, there are areas where artillery firepower cannot be provided. In such areas, guns can be heli-lifted and positioned. This would further enhance our defensive layout.

Of late, our northern adversary has started transgressions in Depsang, Chumar, Doklam and Barahoti. The 73 days standoff at Doklam took a serious turn and resulted in both sides preparing for an outbreak of hostilities. The 155 mm ULHs would be in position in real-time with a reasonable amount of heli-lifted ammunition to be prepared to counter hostile action. There would be no special effort to build roads and tracks for howitzers to get deployed. Of course, we would need a sizeable number of helicopters for undertaking this task. The artillery's motto is *Sarvatra*, which means everywhere and this would be achieved by the ULHs.

Employment in Plains and Out of Area Contingencies

The flexibility of the ULH would make it a force multiplier in the plains as well as in tasks which are Out Of Area Contingencies (OOACs). In the plains, where the speed of operations is very high, these ULHs could be moved to critical areas to provide firepower to heliborne forces as also formations undertaking break-out operations across a minefield or an obstacle. The process of redeployment and provision of continuous firepower would be a reality with the use of the ULHs. In a similar manner, the ULHs could be used for OOACs with our airborne and amphibious forces. The US Marine Corps has rightly selected this gun and is exploiting this aspect fully.

Additional Howitzers Needed and the Requirement for Indigenous Production

The current acquisition entails a total of 145 ULHs out of which 120 are proposed to be assembled in India by Mahindra Defence and BAE Systems. The howitzers, due to their versatility, would be needed in

greater numbers. It would not be out of place for a repeat order being placed, considering the need for filling the voids of medium guns urgently in the mountainous regions of our country. Further, BAE Systems is likely to get an order from United Arab Emirates which could be made in India. The ULH is an attractive proposition for many countries, particularly in Asia and Africa, and this would enable a 'Made in India' gun to be exported to other countries. All this is possible with integration among the Indian Army, Indian Government and Mahindra Defence in conjunction with BAE Systems. It is pertinent to note that being a Foreign Military Sales (FMS) project, the permission of the US government would be necessary.

Development of Precision Guided Munitions (PGMs)

The Excalibur round was fired by the 155 mm ULH in Afghanistan in 2012. The CEP was 5 metres and the troops called the ULH a pistol gun. The Excalibur is a complete 155 mm artillery shell with GPS guidance and pop out fins. It is reported that Raytheon is prepared to co-develop the round with the DRDO for India. This would be a major development as such rounds could be used for surgical strikes against militant hideouts in low intensity conflicts.[11] The US Army has decided that 50 percent of its ammunition would be Precision Guided Munitions (PGMs). It is prudent that the Indian Army should also have 10 percent of its ammunition as PGMs. The DRDO, to economise, could also develop the screw in the Precision Guided Kit (PGK) which is fitted on the nose of the shell. This carries a GPS and has canard guidance which enables an accuracy of 30 metres. There are numerous combinations available and the Design Bureau must chalk out a plan.[12] Addition of PGMs is a must for making the ULH a potent weapon system.

Conclusion

The ULH is a versatile weapon system and its current acquisition would be a game changer for the mountains. The system would initially be flown in and thereafter produced indigenously which would certainly upgrade our technological prowess to manufacture state-of-the-art weaponry. To optimise the system, PGMs are necessary which could be co-developed by the DRDO with a foreign partner. Once manufactured in India, the ULHs could be exported to sustain the private manufacturer. The current acquisition of 145 ULHs would be inadequate and there would possibly be a need for repeat order on the equipment. The ULHs would add a new dimension to firepower and manoeuvre in the Indian context.

Notes

1. Former US Secretary of State Hillary Clinton's lecture at the India Today Conclave, New Delhi, March 10, 2018.
2. "Role of Artillery in a War," 2002, available at https: //www.strategypage.com
3. Naresh Chand, "Indian Artillery Current and Future Status," *SP's Land Forces*, January 10, 2018.
4. Shiv Aroor, "Third Artillery Seminar," at www.livefistdefence.com/2010/05/indian-dg-. Accessed on May 10, 2010.
5. For details see, https: www.youtube.com/watch?v=pBiltYzRJE.
6. "M 777 155 mm Ultra Light Field Howitzer" *Army Technology*, November 15, 2016; also see, "M 777 Lightweight 155 mm Howitzer (LW 155)," www.GlobalSecurity.org
7. "Deploys GPS Shell to Afghanistan," www.defensenews.com
8. Press Trust of India report "Two Ultra-Light Howitzers Land in India: A First in Three Decades," cited in *Hindu Business Line*, May 18, 2017.
9. "Howitzer Barrel Bursts During Trials in Pokhran," *The Tribune*, September 13, 2017 available at www.tribuneindia.com
10. Debalina Ghoshal, "India's Artillery Procurement Saga," *The Diplomat*, September 20, 2014. Available at www.thediplomat.com
11. "GPS-Guided Shells: The New Excalibur's," available at www.defenceindustrydaily.com September 20, 2017.
12. "Precision Guidance Kit," Orbital ATK. Available at www.orbitalatk.com