Indigenous Small Arms Simulators: Force Multipliers for the New Age Soldering

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Training is the ultimate force multiplier. It is often the deciding factor in battle between armed forces of equal strength. Superior training has given the Indian Army an edge, and led to the comprehensive defeat of Pakistan in both the 1965 and 1971 Wars. The adage of "One Bullet One Man" has been the cornerstone of the Army's training philosophy. The ability to carry out effective fire and inculcate high standards of fire discipline is a must for every soldier. Considerable effort is made by all units regularly to ensure high firing standards. All personnel, as part of individual training, regularly undergo yearly firing practice to enhance their firing skills at the designated firing ranges. In the last few years, it has been experienced that increasing operational and administrative commitments have at times led to fewer opportunities being available for conducting firing practice. Also, increasing urbanisation has led to construction of habitats closer to the ranges, resulting in reduced safety distances and their non-utilisation. In a number of cases, the state governments are reluctant to extend the lease/notification of existing firing ranges which has reduced the availability of firing ranges in a station. The analogous impact has been the availability of firing range to a unit or a sub-unit for only one or two days in a month. This has placed a severe strain on the units to conduct firing practices effectively in a shorter time period.

To overcome the decreased availability of firing ranges, as well as the time constrictions, it becomes imperative that use of simulators be incorporated on

a larger scale to maintain combat effectiveness. Simulators provide realistic and cost effective training capability while reducing expenditure on ammunition, logistics, transportation and, thus, time spent on the conduct of the firing activity. They provide an all weather capable platform to enhance weapon handling and firing skills with no restrictions on the time spent, ammunition requirement and individual attempts for achieving the desired standards. Also, the data generated can be stored and analysed to educate the firer at a later stage. Another significant application is in counter-insurgency and high intensity deployment areas, where limited time is available for training. In such areas, soldiers can regularly check their firing prowess in a simulated environment.

The early advent of simulators for training began the world over in the 1950s; however, their large scale application started in the 1980s with the availability of microprocessor-based computers with large data handling and storage capacity. Foreign Armies today have evolved their training standards by incorporating a larger portion of training on simulators and also save valuable public money while retaining combat efficiency and maintaining the required stocking levels of ammunition. In our case, the widespread use of small arm simulators has been restricted due to greater reliance on the accepted practice of live firing. Also, limited availability of simulators either being ex-import or their unsuitability for the types of weapon held by our armed forces, led to their negligible use. The earlier available indigenous simulators had very limited training capability due to the lower degree of proficiency of the simulators. These simulators at times relied on the use of dummy weapons for firing experience which precluded use of personal weapons and thereby defeated the basic purpose of incorporating a simulator for enhancing training standards. Lately, with the increasing demand for simulators, a number of private Indian defence firms have entered this field and, thus, significant advances have been made in development of indigenous simulators to suit the training requirements of the armed forces.

An advanced small arms simulator can virtually reproduce a shooting range indoors where all types of parameters such as target type, shot distance, type of firing practice, etc. can be regulated to suit the firer's requirement. Availability of such a system is essential for individual training in the present environment. One such indigenous simulator which meets the abovementioned conditions has been developed by a Hyderabad-based firm and can meet individual training requirements. The simulator consists of an indoor shooting range comprising four to six firing bays. The computer controlled environment projects the virtual firing range in front of the firers on a large screen and provides the flexibility to select the

Small arms simulator can reproduce a virtual shooting range indoors, available 24 x 7

firing distance and type of target to be fired upon. Perhaps, the biggest advantage of the system is that it allows the use of a personal weapon to be fired at the simulator rather than a dummy weapon as prevalent in many older generation indigenous simulators. The personal weapon can be used by incorporating a different breach block and no other changes are made to the weapon. Also, the weapon is not connected to any external device/ wire which may restrict or hamper the firer's movement. The recoil effect is simulated with the help of a rechargeable component by using a carbon dioxide filled magazine. The simulator is designed to enable the firer to carry out the standard firing practices of a firing range as part of application or classification firing. The firer then conducts his practice by firing at a selected target and the bullet hits are recorded on the simulated targets generated by the computer on the screen. The details of the each individual firer are recorded and a data bank is maintained for future analysis. Thus, a shooter can carry out accurate zeroing of his weapon at this simulator and also application firing before validating his results by live firing at the firing range on the allocated day. Another significant value addition is the availability of simulated combat situations like ambush and patrolling which can be used as an effective tool to gauge a soldier's reactions and his response mechanism to an unexpected attack. This unique feature is a force multiplier as reactions to combat situations are not feasible to replicate realistically during training. Thus, the simulated environment provides an opportunity to the leaders at all levels to train the soldiers to effectively overcome any such eventuality. Corrective measures to improve own reaction capability as well as modify/ improve existing drills can be undertaken, if required. Also, new tactics or counter-measures can be validated and incorporated for effective engagement. Improved reactions will always enable a quick counter-action in unexpected situations and, thus, lead to fewer casualties.

Substituting a part of live fire practice with simulator training will yield higher dividends than a firing practice conducted over one or two days at a firing range. The major advantage that will accrue is that besides reducing the wear and tear of the weapon, the simulator training would significantly reduce the training ammunition requirement. Besides monetary savings, there will be additional cost savings due to reduced transportation requirement and less space required for storage. Taking an example of an infantry brigade—more than 300,000 rounds[1] of training ammunition are utilised annually for individual training. The ammunition cost works out to more than Rs 65 lakh[2] for one year. This can offset

the cost of the simulator within four to five years. As a pilot project, one simulator each can be installed at two division level locations and two to three nominated training centres for assessing the improvements observed in individual training. Improved training standards and cost analysis will indicate that in the initial stages, about 25 percent of the total training ammunition requirement can easily be offset by using the simulator. The desired state within the next ten years can then be to conduct simulator-based training for application firing practice and the classification firing can be practised at the firing range. At a later stage, possibly one simulator per infantry brigade would be an ideal allocation.

In the coming times, equipment will become more sophisticated[3] and, thus, there would be demands on the armed forces to incorporate procedures to prolong the life of a weapon system. Also, economic circumstances may lay down restrictions/ lead to reduction of the defence budget which will have an impact on replacements of weapon systems over the years. The reduced allocation will dictate that efforts be made to maximise utilisation of every rupee. Hence, incorporation of simulators will become imperative for individual training within the Army. India being one of the largest importers of military hardware in the world, it is indispensable that high quality indigenous simulation capability is available to offset the high cost of foreign vendor manufactured simulators. With the modernisation programmes of the Central Armed Police Forces (CAPFs), state police forces and commonality of personal weapon systems like the INSAS rifle, the requirement of simulators will increase exponentially in the coming years. The high demand, the "Make in India" initiative, and the sustained foray of Indian firms in defence production and their tie-ups with foreign firms will provide a much needed boost in accessing the latest technology. This will lead to availability of better simulators, custom made for own use, with near life simulations of combat situations at significantly lower costs.

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Notes

1. The figures represent the approximate estimated quantity, by taking 90 percent of posted strength and factoring in the ammunition requirement of other weapons to the personal weapon scale
2. The cost is an estimated presumption by the author.
3. Rajat Pandit, "Army to get new Assault Rifles", *The Times of India*. Available at http://timesofindia.indiatimes.com/india/Army-to-get-new-assault-rifles-junk-INSAS/articleshow/17685938.cms