India's Future Infantry Soldier

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The Futuristic Infantry Soldier as a System (F-INSAS) project is the modernisation programme of the Indian Army aimed for the infantry soldiers to harness the advancement in military technology, to enhance the operational capabilities of the infantry soldier across the full spectrum of conflict. Project F-INSAS, conceived in April 2005 as part of the Infantry Vision 2020, is operational. This project was undertaken, keeping in mind the concept that the "Best Soldier" of the world cannot have second best weapon, equipment or clothing, stated the incumbent Director General Infantry - Indian Army, Lt Gen Vinod Bhatia, AVSM, SM.[1] This programme is designed so that the infantry soldier's capabilities are enhanced in lethality, situational awareness, survivability, communications, night vision and mobility.

The need for modernisation programmes for the infantry soldiers stems from the fact that today's soldier faces asymmetric wars, which are more lethal and multifaceted than ever before. Against this backdrop, India's F-INSAS programme is being developed, like the comparable ones around the world, keeping in mind the central role an infantry soldier plays in all kinds of security operations. The most significant of these solider modernisation programmes are the Land Warrior of USA, IdZ-ES of Germany, FIST of UK and the French programme, FELIN. At this juncture, most of these programmes are in nascent stages of implementation and only some of them are in the stage of advanced planning of design and implementation.

India's F-INSAS Project

India today, is faced with complex, diverse and evolving security challenges, in which its army plays a central and decisive role in preventing and resolving these mammoth challenges faced by the nation. The future wars would be increasingly lethal, short, and intense, requiring greater deal of accuracy, mobility and precision from the soldiers. The next-gen wars would be information wars, calling for faster decision-making and requiring integration of all the different arms and services, not just of the army, but also operational integration with navy and air force. In this changing global scenario, where wars would be driven by the strength of both man and machine, advanced technologies such as the F-INSAS programme are highly important for the army to make the its soldier a 'self-contained fighting machine.' [2]

Modernisation of infantry is already underway. As part of the current ongoing modernisation of the forces, a few, new generation weapons and equipment have already been or are being inducted. However, there is a need to simultaneously empower the infantry soldier with capabilities that would make him more efficient and an integral part of the war fighting system.

F-INSAS is based on five major technologies: modular weapons; body armour and individual equipment; weapon sights and hand-held target acquisition devices; communication equipment to make soldiers capable of transmitting and receiving complex voice, data and video systems; and portable computers in the shape of "wrist displays" for soldiers and "planning boards" for commanders. Equipping the soldier with lethality, situational awareness, survivability, communications, night vision and mobility, are the cornerstones of this programme. [3]

The F-INSAS roadmap, laid out by Indian defence officials at the project's outset, states that the new system will be supplied to eight to ten infantry battalions (up to 10,000 soldiers) by 2015, with all 325 battalions fully upgraded by 2020. Weapon systems include close-quarter battle (CQB) carbines, assault rifles with potential for detachable under-barrel grenade launchers (UGBL), light machine guns equipped with third-generation night-vision devices and laser designators. The first objective of the F-INSAS project is the development of a new standard-issue armament to replace the ageing **INSAS (Indian Small Arms System) rifle**, which was developed by India's Armament Research and Development Establishment (ARDE) and introduced by the Ordnance Factory Board in the late 1990s. To replace the INSAS, the army wants to develop or acquire a new modular, multi-calibre group of weapons. The primary weapon is planned to

be a rifle capable of firing 5.56mm and 7.62mm ammunition with a new 6.8mm under-development. The new assault rifles will be modular allowing replacement of sub assemblies without specialised tools. They will feature interchangeable barrels, a combination of some or all from amidst 5.56 X 45mm, 7.62 X 39mm, 7.62 X 51mm, 6.8 X 43mm and 6.5 Grendel. This first stage alone will reportedly cost up to Rs 250bn ($5Bn). Soldiers will use the 7.62 x 39mm barrels for counter-insurgency operations. But if deployed for conventional warfare, then they will use the 5.56 x 45mm barrels. According to certain news reports, the global tender for direct acquisition of 66,000 advanced assault rifles was floated in November 2011, which will also be followed by licensed manufacturing, under transfer of technology (ToT) to equip the armed forces as well as the central paramilitary forces. The army is also shopping for tripod-mounted 12.7mm heavy machine guns, which can fire armour-piercing rounds at a rapid clip. Also on the weapons list, proposed for the system, includes a specialised sniper rifle. A Request for Proposal (RFI) has already been released in this regard.

The government is looking to entice bidders for developing a multipurpose and rugged general purpose gun for Indian Special Forces (SF), as well as a rifle with the capability to shoot around the corners. The Israeli CornerShot rifle, which is has the capability for this patented technology, is in the running to meet this requirement of the SF. CornerShot has already been supplied to India's National Guard.

In the later stages of the programme the Indian Army intends to complement its new weapon platforms with a range of high-tech equipments for its infantry soldier. These equipments included a new helmet with mounted thermal sensors and night vision; cameras; and chemical and biological sensors. The helmet will have an integrated visor with a helmet-mounted display (HMD) capable of outputting images with the equivalent space of two 17-inch computer screens. The HMD presumably improve communications, offering direct data and voice to the soldier on the battlefield. The helmet will be made of a lighter-weight composite material so that it balances out the additions specified above, but still protects the soldier from 9mm carbine rounds and shrapnel.

Other proposed additions include a full battle-suit with a bullet-proof and waterproof jacket, health sensors and even solar charging devices. This kind of personal energy generation could be used to power the soldier's HMD and sensor systems, as well as a wrist-mounted Palmtop GPS system that will be used to increase battlefield awareness and act as a networked messaging system between battalions and their commanders. Infantry soldiers will be equipped with an

Integrated Computer and Communication System with high-quality communication and data services. The system will feature wrist display for soldiers and portable planning board for commanders, GPS, digital magnetic compass, dead reckoning module (in the case of GPS failure) and UHF and VHF communication. The army is looking for light weight and ruggedised Hand Held Target Acquisition Device that can capture day and night view of the desired area (video and stills) store, display and transfer the same.

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The 2012 Request For Information (RFI) was released to fill a gap in fibrescope technology, issued under the observance of several directorates including the Directorate General of Infantry. Once a special operations technology, the fibrescope is essentially an optical wire that can be inserted through 10mm gaps in doors and other obstacles, relaying the image on the other side without detection. The scope is intended to be INFRARED-capable, capturing and recording up to 10 hours of footage or up to 1000 black and white photos, which can be simply uploaded to a computer via a USB connection.

There is plan to replace the Army Radio Engineered Network (AREN) tactical area communications system with the Tactical Communication System (TCS). In addition, the Army's Automatic Message Switching System (AMSS) is being replaced by the Army Wide Area Network (AWAN), connecting all services and installations within India. TCS will consist of trunk nodes such as the key bandwidth carrier connecting points, terminating at access nodes for Brigade-level communications. The subsequent plan is to extend this technology to the Company level.[4]

One of the main aims of the infantry modernisation programme is that the army aims to reduce the overall weight carried by the infantry soldiers by at least 50 percent. This will enhance the survival rates and operational effectiveness of the soldiers. The challenge is to ensure maximum level of protection for the soldier without compromising on weight and cost. Under F-INSAS, the Indian government is seeking a tactical vest that will protect the legs, groin, neck and collar from ballistic projectiles. One of the most costly features of the F-INSAS project might turn out to be the medical sensor suite. Under this technology, integrated medical sensors are being embedded into the soldier's clothing to deal with all possible health hazards. These in-built real-time monitors will consist of a diagnostic suite enabled to measure vital signs such as heart rate, blood pressure, body temperature, stress levels and even physical impact, essentially allowing

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medics and doctors to know immediately where the injuries are located and what needs to be done to stabilise the soldier. There is also a notion of lacing the fabric on uniforms with blood-clotting fibres, which could in theory be tied in with the "onboard" sensors. It would need re-tailoring to meet the needs of both budget and practicality. There are also reports that the ARDE is exploring for counter-IED boots, which would enhance the chances of lower limb protection in the event of a soldier stepping on a landmine.

Despite the hugely ambitious nature of the cutting-edge programme, the F-INSAS which is reportedly planned to be rolled out in stages between 2012 and 2020, has shown little tangible progress in terms of deliverables of the above mentioned technologies. The entire programme, which will be implemented in phases, is spread over the 12, 13 and 14 five-year plans (2012 to 2027).[5] To add to this, there is a degree of secrecy about this project from the Indian government's side, which makes it difficult to know the exact nature and progress of this project. The host of armed forces modernisation programmes (many of which overlap in terms of objectives), combined with a lack of official clarification from government sources, have created conflicting reports, even when over the project's first stage of weapon development.

Defence Research & Development (R&D) is an area where accountability often takes cover under the policies of self reliance, and indigenisation, which becomes a reason for delay. There is need for accountability of the domestic R&D organisations to be re-emphasised to enable better assessment of return from investment for these advanced weapon technologies. Sensitising of the defence services to the role of public audit is essential. The Indian Government's insistence on eschewing private sector involvement in defence procurement in favour of public organisations like Defence Research and Development Organisation (DRDO) is hampering its ability to get projects moving. The Indian military is beholden to the government-run DRDO whose performance is a matter of debate and controversy. So although the military has large autonomy, it is nonetheless reliant on another organisation to execute its plans in the procurement area.

Picture evidence from military events seems to show that Indian companies like TATA Advanced Materials and TATA subsidiary, Nelco are working on various parts of F-INSAS equipment and accessories, from night vision goggles and body armour to personal power packs. However no official confirmation of these contracts by either companies or the government has been published.

The pace of modernisation is a slow one. It is due to many factors including the spaghetti junction of Indian bureaucracy, the red-tapes involved in the procurement process, financial constraints, civil-military relations and the lack of government's willingness to push defence files due to the history of corruption cases related to defence, among other issues. Given the high-conflict region that India is in, 'urgent operational requirements' consume a bulk of financial resources allotted for defence instead of the weapons modernisation programmes, thus slowing down these modernisation programmes. The world is moving from platform-centric warfare to network-centric warfare where the need to deploy these modern technologies such as F-INSAS would be higher. Hence, there is a need for the Indian authorities to pay the much-needed attention to the modernisation programmes for the armed forces to prepare India for future wars.

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Notes

1. Indian Strategic, "Indian infantry needs to modernise itself," http://www.indiastrategic.in/topstories1524_Indian_Infantry_needs_to_modernise_itself.htm, accessed on 10 August 2012.
2. Rediff, "F-INSAS: Army the soldier of the future," http://www.rediff.com/news/report/f-insas-arming-the-solider-of-the-future/20111026.htm, accessed on 11 August 2012.
3. India Defence Projects (IDP) Sentinel, "Futuristic Infantry Soldier-As-A-System (F-INSAS)," http://idp.justthe80.com/army-projects/futuristic-infantry-soldier-as- a-system-f-insas, accessed on 11 August 2012.
4. Defence IQ,*F-INSAS: An Update*, London:2012
5. The Times of India, "Army initiates plan to transform jawans into hi-tech soldiers," http://articles.timesofindia.indiatimes.com/2011-12-25/india/30556356_1_f-insas-assault-rifles-detachable-under-barrel-grenade-launchers, accessed on 12 August 2012.