

ZEN TECHNOLOGIES LIMITED: PIONEERS IN SIMULATION TECHNOLOGY



SMEs contribution in terms of productivity, competitiveness, innovation and the high importance of knowledge have assumed greater importance in the aerospace and defence sector. Zen Technologies is a shining example of what SME can do with emphasis on indigenous design, development and manufacture of state-of-the-art simulators, which can compete with world-class products. Gist of interaction with Mr. Ashok Atluri MD Zen Technologies on the background development and way forward.

1. In order to keep the Armed Forces fully prepared for war, men and machine of the three Services need to be kept in highest state of battle readiness all the time. While the machines can be kept battle ready by regular and proper upkeep, care, repair and maintenance, men need to train hard during peace time to be fully battle ready for the wars. However, because of numerous operational, administrative and logistical constraints armed forces find it quite difficult to conduct meaningful training for their officers and men as regularly and rigorously as is desired so as to keep them battle ready all the time.

2. To overcome above challenges, armed forces world over have been using simulators. Simulation technology have grown in leaps and bounds and today we have training simulators for all

types of equipment and battlefield environment. It is now for the user to decide level of fidelity of the simulator he wants. If he is prepared to pay for it he will have a simulator exactly like the original equipment. Higher fidelity system would obviously be exorbitantly expensive. There are distinct advantages of using simulators for the training of personnel as per details below:-

(a). **Effectiveness of Simulators in Imparting Realistic Training.** Simulators have proved to be a very effective training aid in imparting realistic and meaningful training to the armed forces personnel in units, formations, Class A & B Establishments. Users are very happy with the capability of these simulators which provide real time feel and performance of the original equipment or a system. The simulators truly replicate ergonomics of the actual systems and have realistic controls, indicators, viewing devices and instrument panels. Experts have evaluated a trainer or a simulator by evaluating the skills it has been able to impart a trainee in carrying out an operational task effectively. Their experiment consisted of forming two groups of trainees; identical, compatible and equally qualified. The first group (experimental group) trained on the simulator while the other group (control group) trained on the actual system for the same duration of time under similar conditions. Both groups were later tested on the actual system and it was noticed that the experimental group invariably performed better than the control group. Thus the efficacy of a simulator in imparting better quality of training was established. There are many reasons for the same which will be discussed subsequently.

(b). **Cost Effectiveness.** A trainer is far more cost effective method of imparting training. In the first place, trainers are much cheaper than the original equipment. A gunnery simulator for a tank is available at a fraction of the cost of a tank. Then it saves on the recurring expenditure on fuel and costly ammunition. It also saves on the wear and tear and of the original equipment thus reducing the expenses on repair and maintenance, mistakes by the trainees do not damage the equipment or injure the trainee. One simulator can train more trainees who would have otherwise required more numbers of original equipment to achieve same level of training. More than anything else use of a simulator conserves the life of the equipment operational purpose and leaves more fuel and ammunition in the hands of the units for their operational tasks.

(c). **Ease of Training.** With a trainer at hand, training can be conducted anytime at a very short notice. All it requires is

that trainees and their instructor should be available to train. Units do not have to wait for the allotment of range for the conduct of small arms training or classification firing. Tanks do not need to be taken out to such training areas, which are not so easily available, where they can manoeuvre or fire. It is not always easy to release troops and other resources for an outdoor training. Such training sessions can be carried out as per the convenience within the unit areas and training can be imparted round the clock, seven days a week, if desired.

(d). Training under the Watchful Eyes of the Instructor. Most simulators come with an Instructor station. It is the instructor who sets the exercise for the trainees and monitors their performance real time while they are practicing. He counsels them when they make mistake and helps them in correcting their mistakes. System records the performance of each trainee which can be replayed, rerun to understand rights and wrongs and take corrective actions. Simulators are able to indicate actual mistake made by the trainee. Such immediate feedback mechanisms allow the trainee to apply this newly acquired knowledge immediately and as we know that application, like experience, is the best method to train an adult.

(e). Training on High Risk Systems or High Risk Tasks. Training of newly commissioned officers to become expert fighter pilots is an extremely risky business. Making them fly an actual fighter aircraft, despite most extensive class room training, will be extremely dangerous as it may result in loss of precious life and scarce training aircraft. Similarly, training of medical officers on actual patients may endanger



the life of the patients. It is well known that Indian Air force permits new pilots in the cockpit after an extremely extensive training on flight simulators. Similarly medical fraternity is using simulators for training of their medical staff. Simulators have been found to be very effective method of training in such high risk jobs as they not only reduce the danger, they also prepare the trainees with such

skills that makes them confident to take on such jobs with minimum or no risks.

3. While Indian Air Force (IAF) has been using the simulators for a very long time for training of their fighter & transport aircrafts & helicopters pilots and maintenance Staff, Indian Army has begun to use the simulators in the right earnest in last one decade or so. A very large number of simulators for various weapons and platforms have been procured during the period and the trend continues. Para Military forces and State Police forces are also looking at simulators much more seriously as an effective alternate means of training their personnel. More funds are being allocated for the purpose. Resultantly, one can find a many more number of RFIs and RFPs for simulators than in the past. Even the RFPs issued for main weapons, weapon platforms are also taking into account user's requirement of simulators and including them in their bill of materials. The Simulator market is growing at a reasonably good pace and would really be very big one in years to come.

4. A potentially huge simulation market, notwithstanding, there are not many Indian companies who are seriously into simulation business even today. Some of them who are in the business are dependent on foreign OEMs or foreign simulation companies to address the need of domestic users. They are more in the category of traders than developers of niche technologies to indigenously address the needs of the defence forces/paramilitary forces/police forces.

5. Zen Technologies Limited Hyderabad, a Public Limited Company, is one of very few Indian companies who have taken this segment of business quite seriously. Incorporated in the year 1993, the Company has remained totally focused in the business of design, development and manufacture of virtual and live training simulators for Defense Forces, Para Military forces (PMF), Special Forces and State Police Forces. ZEN has been on the forefront of applying new technologies and developing new products and is actively involved in indigenization of technologies, which are helpful for Indian security forces.

6. The Company lays emphasis on indigenous design, development and manufacture of state-of-the-art simulators, which can compete with world-class products from renowned International Simulator Companies. The Company therefore maintains a very strong and capable R&D Unit which is headed & guided by a Functional Director. The R&D Unit is equipped with sophisticated software tools and has skilled manpower. The Team has been able develop niche technologies in the domain of Software, Electronics, Mechanical engineering and Optics that are vital for development of high quality simulators indigenously. The Company is therefore capable of making nearly 100% indigenous simulators as per User's requirements and specifications. Their products not only fully meet stringent quality standards of Defense Forces world over but also are

cheaper than most.

7. Company's R&D Unit has been recognized & accredited by Department of Scientific and Industrial Research, Ministry of Science & Technology, Government of India. Some of the niche technologies developed by their capable R&D Team in above stated four domains include State of the Art Mathematical Modeling Software to determine Projectile Behavior, Vehicle Dynamics, Environment Effects, Video/Image Processing Software for depiction/creation of 3-D Models, real time data acquisition, Electronic Control system for motion platform including motion cue algorithm, Sensor Interfacing, Projectile Miss and Hit Detection System, Weapon Laser Sensing System, Wide Screen Projection System including edge blending, Micro-screen based sighting system for simulating realistic missile and tank sights, Small Arms Weapon Sensor Integration, 3,4,5 & 6 DoF Motion Platforms, Static and Dynamic Load Analysis, Motion Analysis, GD&T Analysis, Weapon Recoil System etc.

8. Zen has primarily focused on the requirement of simulators for the Land forces and other security Agencies. In last 21 years, company has developed more than 30 products. Some of the products from the impressive list are Advance Weapon Simulator, Tactical Engagement Simulator, Anti Tank guided Missile Simulator, Infantry Combat Vehicle (ICV) BMP II Driving and Missile simulator, Artillery forward Observation Simulator, Hand Grenade HE 36 Simulator, Driving Simulators for T72 & T90 Tanks, Basic & Crew Gunnery Simulator for T72 & T90

Simulation System, Zen now plans to venture into other areas of Simulation such as flight simulation and constructive simulation. The Company has already indigenously developed Full Mission Simulator for HERON & SEARCHER MK II UAVs which are being used by three Services and will soon participate in procurement process of MOD. Company has recently signed a Memorandum of Understanding (MoU) with Rockwell Collins Training and Simulation LLC, USA for design and development of Full Mission D Level Simulators for military aircrafts and helicopters. Company will soon participate some of IAF Simulation projects. Zen is awaiting RFPs for Wargaming Centre for IAF and Operational Level Wargaming Solution for IN. The Company is confident that it will offer competent solutions in these fields as well in time to come.

10. Company feels that truly indigenous products need to be encouraged in alignment with Govt's First Develop India and Make in India goal. The company has made certain formal requests/recommendations for policy changes through FICCI/CII so as to promote Indigenously Designed Indian Defence products. Some of the requests and recommendations of the Company are as under:-

- (a). Introduction of 'Buy Indian with Indigenous Design' Categorisation in DPP 2013, wherein RFP is issued only to companies that have Indigenously developed the product with at least 75% indigenous content.
- (b). Provision in DPP to procure an item in a single vendor situation if the product is totally Indian with indigenous



Tanks, Smart Target System (ZEN LOMAH), Multi Functional Target System, Tank Zeroing System, Armored Combat Training Simulator, Medium Machine Gun Simulator, AGL Simulators, Driving Training Simulator, Driving Simulator, Bus Simulator, Driving Aptitude Testing System, Tatra Heavy Mobile Vehicle Simulator. In addition to the impressive product line, company also has equally impressive Patent List.

9. Having created a niche market space for itself in Land

content at 75% or more.

- (c). In a multi-vendor procurement, provisions in DPP to procure item from L-2/L-3 vendor provided their product has at least 75% indigenous content and that they are willing to sell the product at L-1 vendor price.
- (d). Liberalisation of MAKE Procedures for participation of Indian MSMEs.
- (e). Assured participation of MSMEs in MAKE Procurement case.