

ARMY CHIEF - INTERVIEW | FUTURE WARFARE

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AERO INDIA'23

SPECIAL ISSUE

First news portal dedicated to the
Indian Defence Industry



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NEW ERA OF WARFARE



It's time for another edition of Aero India, Asia's premier aero show. In its 14th edition at Bengaluru, Aero India will witness the participation of 731 exhibitors out of which 633 are Indian companies. The theme for this year 'The runway to a billion opportunities', is well in sync with India's presidency of G-20.

This edition is a great opportunity for the Indian government, armed forces and industry to look at the opportunities and challenges in the emerging technologies which would shape the military of the future.

This edition of AeroIndia must be observed from a different viewpoint. The ongoing Russia-Ukraine conflict has outlined the contours of future wars and India needs to realign its procurement and development plans accordingly.

In this edition, we have made efforts to outline the nature of future wars, especially air warfare. This is a humble attempt and we don't claim it either to cover all factors that would shape the future of warfare.

Drawing lessons from the Russia-Ukraine conflict, Rakesh Krishnan Simha is analysing the nature of future warfare and lessons for Indian military planners. He is advocating a relook at the idea of short-swift war and the preparation for long-drawn conflicts. India needs to learn the right lessons and integrate them in its military planning.

Gp Capt (Dr) RK Narang(Retd) is analysing the challenges in achieving self-reliance in drones and how India can become the global hub of UAVs.

This edition's cover story is by Air Cmde (Dr.) Ashminder Singh Bahal (Retd), wherein he described in detail the factors and technology which are redefining air warfare. Our cover story lays out a roadmap for reequipping the Indian Air Force for future challenges, especially against India's main adversary China.

In this edition we are presenting, our interview of the Chief of Army Staff on the occasion of Army day wherein he has discussed in detail a variety of topics including, border issues, upcoming technology, procurement programmes and agniveers.

Hope this edition is a good read. ■

ROHIT SRIVASTAVA
Editor, **GeoStrategy**

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The world is witnessing the emergence of a new form of warfare which is expected to reconfigure military forces. Air warfare being the most technology-dependent is expected to undergo massive changes

by **AIR CMDE (DR.) ASHMINDER SINGH BAHAL, RETD**

COVER STORY

With the emergence of air warfare provided the vital third dimension that circumvented the enemy's fielded forces and terrain imperatives and attacked his critical vulnerabilities in depth. This produced a significant disproportionate effect on the conduct of war. The capabilities of long ranges, precision and concentration made air warfare, the primary instrument of choice.

Rapid strides in technology considerably enhanced airpower's reach, precision, and potency. Air-to-air refuelling ensured that no part of the world was safe from an air attack. Developments in the field of electronics and avionics that included sensors, computers, night vision, guidance systems and warheads, enhanced flexibility

in the employment of aerial elements. Thereafter, came the close integration with space-based assets.

DRONES - GAME CHANGER

Conflicts today require swift reaction and the capacity to control information becomes a decisive factor. The arrival of drones provided the ability to locate and track enemy deployments, gather electronic intelligence, designate and/or destroy targets, and simultaneously evaluate the extent of target destruction that has taken place. Drones could therefore undertake the entire detection to destruction loop significantly faster, hence, bringing in considerable operational effect.



FUTURE OF AIR WARFARE

From micro and mini drones operated by Pakistan-based elements to airdrop arms and ammunition in India for fomenting terrorism to mini, medium, and large drones used in Afghanistan, Iraq, Nagorno-Karabakh, Syria, and in the ongoing Russia-Ukraine war, drones are employed by both state and non-state actors. The use of unmanned elements was critical in the success of Azerbaijan forces at Nagorno-Karabakh and highlighted how the armed drones were changing the way warfare is conducted. From High Altitude Long Endurance (HALE) drones to cost-effective Switchblade loitering munitions, unmanned aerial vehicles (UAV) have come a long way to make the ominous battle tank look impotent in the contemporary battlefield.

These loitering drones act as a cost-effective nemesis to exposed target systems. The conduct of air warfare is therefore changing like never before with the emergence of new and contemporary technologies. The hue and cry being whether like the battle tank, are the days of fighter aircraft over?

EMERGING TECHNOLOGIES

The key emerging technologies include the development of hypersonic reusable trans-atmospheric vehicles, Airborne Laser technologies, Space-Based Infra-Red Systems, Unmanned Combat Aerial Vehicles, ASAT technologies, and all-weather smart air-to-surface weapons. Stealth has played a crucial role in enhancing the survivability of airborne platforms. The B-2 bomber, F-22 Raptor, J-20, and Joint Air to Surface Standoff Missiles with their low observable characteristics give the unique ability to penetrate lethal air defence networks and attack heavily defended targets. No target however distant and how well protected is today safe from an aerial attack. This has severely curtailed the movement of surface forces.

Hypersonic - Extensive developments are taking place in

Commercial remote sensing and satellite communication companies are being increasingly utilized by the armed forces for military use

manoeuvrable hypersonic trans atmospheric re-entry vehicles, which could be used as weapons to defeat missile defences. China's hypersonic vehicle flew at 30 km altitude reaching Mach 7 speed in 2021. The most promising Chinese program is turbo-aided rocket-augmented ram/scramjet combined cycle (TRRE), which uses liquid-fuelled rockets to boost the performance of the ramjet stage and makes a smoother transition to Mach 10 speed. With key components like engine inlet, cooling and combustion already developed, full-scale TRRE is expected to begin flights by 2030.

Stealth - People's Liberation Army Air Force (PLAAF) has upgraded itself with '20' series aircraft that include stealth J-20 fighters, Y-20, the long-range transporters, and H-20 that matches US B-2 stealth bomber characteristics. It is also developing JH-XX stealth bomber. China considers stealth and unmanned platforms as key force enablers. These aircraft give China the ability to undertake strikes deep inside India. Meanwhile, India's fifth-generation fighter aircraft project has stalled, and the Advanced Medium Combat Aircraft (AMCA) will take a long time to fructify considering that it is in the design stage. This brings a significant vulnerability to the IAF in the interim period.

Extended Range Weapon - Developments are taking place to extend the ranges of air-to-air and air-to-ground weapons to enhance the survivability of platforms as the ranges of air defence systems increase. Boeing has designed a Long-Range Air-to-Air Missile (LRAAM), which has a two-stage configuration with a 'kill vehicle' attached to a booster section. LRAAM would exceed the capabilities of the Chinese PL-15 air-to-air missile that was intended to attack targets at ranges beyond 300 km.

Similarly, ranges of air-launched cruise missiles have shown a marked improvement. In 2016, India became a member of the MTCR, and currently is jointly developing Brahmos missile with an 800 km range with the ability to hit protected targets with pinpoint accuracy whilst flying at hypersonic speeds of 7-8 Mach. IAF successfully test-fired 450 km range Brahmos in December. This provides Indian Air Force the ability to attack any target in Pakistan whilst remaining well inside the Indian territory.

Artificial Intelligence - It has two key characteristics - first, the ability to use data to facilitate quick decision making and second, being autonomous, they do not need human intervention. The sheer impact of AI is being considered as the next revolution in warfare and most major military powers are working today to build cutting-edge technologies for autonomous weapons.

AI applications are being incorporated into military systems, operational processes, target recognition sensors, homing devices, autonomous weapons, decision support elements, simulations, surveillance platforms and offensive and defensive weapons.

AI helps in developing robots that could attain superior intellect to humans and operate under the control of another AI system. AI integration is significantly affecting nuclear, conventional, asymmetric and hybrid warfare.





Keeping this in mind, China has moved its operational concept of ‘Informationalised warfare’ to ‘Intelligentized warfare’ which is a unique Chinese concept of applying AI’s machine speed and processing power to military planning, operational command, and decision support. They are not only integrating AI into war-fighting functions but are planning to use it to shape a new cognitive domain that would lead to a novel approach in warfighting.

In this regard, the US and India have enhanced their strategic partnership by jointly launching an Initiative on Critical and Emerging Technology (ICET) this January. Both have officially announced that the two nations will increase cooperation in AI and military equipment. This would in essence relate to countering the extensive developments taking place in China.

To fight integrated multi-domain operations, all the UAVs and drones along with manned aircraft and AD systems should be maintained by the IAF to make effective employment of these assets as well as to make maintenance and operations more cost-effective

FUTURE CONCEPTS

Aerospace technologies have moved from Unmanned Combat Aerial Vehicles (UCAV) to smart drones. The future scenario could include small drones swarming hostile air spaces for undertaking surveillance activities and identifying critical targets whilst saturating the enemy’s air defence systems with low signature aerial elements. The value of drones could lie in simultaneously causing damage to numerous geographically dispersed high-value targets, thereby creating systemic functional paralysis.

The drones in the future would have the interactive ability and would be able to transmit and exchange air and ground situation pictures between each other as well as with the manned fighters. They are cost-effective as they undertake persistent monitoring of contested areas relatively inexpensively. Boeing is even developing a swarming system for larger drones. The extensive use of smart drones is already changing the way warfare is conducted today.

The cheap drones obviate the need to employ expensive manned fighters thus bringing in a progressive shift from manned aircraft to smart drones that are highly potent in destroying well-defended targets with precision. This implies that a shift is already taking place from the use of manned combat and surveillance aircraft to small, smart, and highly potent UCAVs. The unmanned systems could interface intimately with their manned counterparts as AI develops capability multiplication elements.

Initially, the transition would come with a combination of manned and unmanned elements operating in tandem in integrated battle spaces and subsequently, the majority of platforms in conflict areas would be unmanned. Further, even within UAVs, there would be the need for an appropriate combination of high, medium, and

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low-altitude drones. By 2035, the number of unmanned platforms would be high and employment of a combination of manned and unmanned platforms would be the norm.

As AI technologies progress to deep and super learning, artificial neural networks could then be connected in such a manner that the system becomes superior to the functioning of a human brain as it gathers, collates and processes large amounts of data obtained from different drones and sensors (something that will happen when swarms of drones penetrate enemy air space) and these neural networks would have the ability to operate much faster than a human brain can ever function while simultaneously learning and upgrading itself by interpreting data patterns and the experience that it obtains in the process.

Integrating AI technologies completes the detection-identification-targeting-destruction-battle damage assessment loop in a much faster timeframe. As technologies evolve and computing speed and big data analytics improve, the size of the drones too would reduce resulting in drones becoming stealthier, lighter, and more effective.

Whilst satellites give imagery with a larger swath, UAVs give imagery with a better spatial resolution (less than 10 cm), but over a much smaller swath. For example, the Earth Scanner-2 satellite gives 50 cm resolution with a swath of 150 km whilst collecting 2 million square km of imagery per day. On the other hand, UAVs can provide 4-8cm resolution imagery though with a much lower swath and therefore providing a much lesser quantum of imagery. Satellites cover larger areas in a shorter period but cannot maintain orbit over a location and have re-visit times, whilst UAVs cover lesser areas, but give better resolution and can maintain over a location continuously.

Whilst satellites give imagery with a larger swath, UAVs give imagery with a better spatial resolution (less than 10 cm), but over a much smaller swath

UAVs usually require an operator to control them effectively, and winds and weather affect them significantly, yet their advantages are that they could be flexibly employed, controlled to change locations, even in the air and have very high-resolution discrimination. On the other hand, satellites can overcome terrain and obstacle limitations as well as sovereignty issues that are encountered by UAVs. Hence, both platforms have their unique advantages and disadvantages but synergised integration of both could lead to significant complementary and potential synergies.

LINE OF SIGHT

Line-of-sight data links may become impractical to use over large ranges due to the earth's curvature and drones could easily move out of such network coverage due to en route obstacles. A Geo-stationary communication satellite could prove to be valuable in providing command and control linkages between the Ground Control Station (GCS) and the UAVs in data exchange and transfer between the UAVs as well as between the UAV and the GCS. The range of UAVs, especially those over oceans can be extended. Available technologies can create secure, reliable command and



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control links between UAVs and GCS to monitor status, remotely control the UAV and switch between the remote control and autonomous operations in Beyond Visual Range operations.

MULTI-DOMAIN OPERATIONS (MDO)

Future wars fought in integrated battle spaces with MDO strategy would move ahead from the air-land battle concept to attaining multi-domain aerospace dominance. This fighting construct integrates different systems, belonging to the three services as well as utilizes surface, air, space or underwater domains including the electromagnetic spectrum and cyber. MDO links platforms and systems belonging to different domains into a strong interconnected system of systems approach to fight in integrated battles.

From platform-centric, the operational philosophy would gravitate towards fusing platforms over interconnected systems. The effectiveness of air warfare would depend on how well the different systems can be integrated seamlessly to exploit their combined capacity to create a considerable effect. The integrated aerospace forces would then need to have the coherence to operate across multiple domains without facing fratricide whilst maximizing the potential of exploiting windows of opportunity.

The operational environment would become lethal and hyperactive. More than space and physical degradation, functional paralysis would become crucial. To achieve this, the focus, besides being on the physical targeting of command, control, and communication nodes by manned and unmanned elements, would also be on targeting adversary's AI technologies with the help of cyber warfare.

AI integration in drone technologies and command-and-control systems would enable dynamic and swift planning, provide flexible operational options, reduce the time of response, minimize focus on analysis and shift efforts towards execution of actions by minimizing the gap between identification of opportunities and initiation of a response. It will assist in synergizing diverse capabilities while disseminating actionable information at a speed and scale that is humanly impossible.

The growth in operative speed implies that the reaction time with the enemy would be much lesser. The enhanced speed of action with the integration of drones and smart munitions that loiter in the contested air space would ensure that the side that can generate multi-domain capability will have a significant advantage in maintaining an upward spiral of combat operations as they would be operating within the Observe Orient Decide Act (OODA) loop of the adversary.

The operational outcomes will become considerably larger with every phase as the adversary would be fighting a losing battle from the very start and would be unable to coordinate its operations while continuously losing vital capabilities. The future scenario indicates the emerging lethal air war concepts, the force structure for which must be created from today.

INDIAN SUB-CONTINENT

The conventional threats in the Indian sub-continent range from asymmetric/hybrid warfare to high-intensity conflicts fought under nuclear thresholds. The close cooperation between Pakistan and China in defence field highlights the need to seriously consider the two-front war scenario.

The growing economic and technological strengths of China are creating wide asymmetries. In 2022, China's official military budget was 1.45 trillion yuan (US\$230 billion). However, the actual defence

AI helps in developing robots that could attain superior intellect to humans and operate under the control of another AI system. AI integration is significantly affecting nuclear, conventional, asymmetric and hybrid warfare

budget is estimated to be around \$290-300bn. It is felt that by 2035, the defence spending of China will surpass that of the US. China completed its military reforms in 2018, aspires to achieve complete modernisation by 2035 and aims to attain a world-class military by 2049. Chinese current focus is on the indigenisation of defence industries and civil-military integration.

PLA's Western Theatre Command and Southern Theatre Command are closely integrated to prosecute the 'War Zone Campaign'. China's Rocket Forces and Strategic Support Force have been organized to conduct military operations in space, cyber and information spaces to unleash precision attacks on key Indian targets.

PLAAF is three times larger than the IAF and has a strategic bomber fleet, more AEW/AWACS aircraft, and numerous armed drones. By 2035, PLAAF's modernization drive will bring in substantial superiority in fifth-generation aircraft, Directed Energy Weapons, space-based assets, anti-satellite weapons (ASAT), UCAVs, anti-ship ballistic missiles, AWACS and strategic airlift assets.

China is developing a sixth-generation fighter, which by 2035 will be equipped with auxiliary drones and AI technologies, which would provide the manned-unmanned teaming capability. This increases China's technology differential, and in 2035 could create strategic disparity for India.

China has over 500 ballistic missiles including 100 Inter-continental Ballistic Missiles, a few with Multiple Independent Re-entry Vehicle warheads. They have several tracking stations: Karachi (Pakistan), Malindi (Kenya), Swakopmund (Namibia) and Neuquen (Argentina). In addition, DF-41ICBM can carry multiple independently targetable re-entry vehicles and hypersonic glide vehicles. In August 2021, China tested a hypersonic glide vehicle circling the earth in low orbit; thereby demonstrating China's advanced space capability. Most modern AD systems pose little threat to hypersonic vehicles and only Russia and China have operationalized hypersonic systems.

IAF'S REDUCING NUMBERS

The combat strength of IAF has reduced from the authorized 39.5 squadrons to 29-30 squadrons.

The decrease in IAF's fighter strength was earlier offset by the Su-30 induction, but the IAF's retirement rate far outstripped its intake of new aircraft. IAF is likely to be left with around 27-28 combat squadrons by 2025-27, even with additional LCA and Su-30 MKI aircraft. India needs to acquire two more squadrons of Rafale quickly to tide over the short term. By 2035, Pakistan would have around 18 combat squadrons with significant numbers of fourth-



generation (mostly advanced JF-17s and J-10s) and some fifth-generation aircraft. On the other hand, it is estimated that China would field more than 1,300 fourth/fifth-generation fighters that include a significant number of stealth fighters/bombers; there is an urgent need to enhance the IAF's stealth potential by acquiring at least two F-35 equivalent fighter squadrons in the interim on priority.

In addition, there is a crucial requirement to procure additional Airborne Warning and Control Systems, modern radars, additional Ballistic Missile Defence capability and Unmanned Combat Aerial squadrons. Meanwhile, the defence budget hovers around 2% of GDP. This would be considered inadequate to go ahead with large-scale capital procurements. There is a need to increase the defence budget to 2.5% of GDP for the next decade.

It is necessary that India needs to quickly develop and acquire stealthy unmanned aerial combat platforms and procure large numbers of mini, micro-UAVs with Kamikaze ability.

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WAY FORWARD FOR IAF

China respects strength and IAF needs to follow an offensive-defensive approach. Responsive capability needs to be built based on intimate integration between the three services. Strategic lines need to be identified not only on the nuclear force employment but also on Chinese deployments, wolf warrior actions and coercive creeping expansionist policies.

As regards the IAF is concerned, the MiG-21, AN-32 and MiG-29 aircraft have been upgraded. IAF has also upgraded 118 Jaguars with new engines, airframes, avionics, modern radars, and weapon systems, which gives the fleet additional 20 years of life. It is also upgrading 40-50 Su-30 MKIs (to carry Brahmos missiles) and Mir 2000H to Mirage 2000-5 Mk2 standards. In addition, the IAF has acquired 36 fourth-generation plus Rafale aircraft.

Since stealth has become essential to defeat dense air defence environments, the indigenous development of AMCA aircraft needs to be undertaken on high priority. There is an urgent requirement to have a fifth-generation fighter by 2027 to counter the increasing numbers of J-20 aircraft. The RFI to procure 114 medium-weight fighters was issued in April 2018 for a single-engine non-stealth fighter and would be equivalent to LCA Mk IA. While the requirement is for a stealth fighter, the IAF is trying to procure an aircraft in the fourth-generation stage, thereby, not progressing to the fifth generation. It is already procuring 83 LCA Mk-IA fighters from 2024-2029 in addition to the 40 Mk-1 LCAs procured earlier.

Instead of going for large numbers of fourth-generation fighters and relying on AMCA for stealth would put India in a significantly disadvantageous position against PLAAF and PAF. Hence, it is essential to procure few squadrons of stealth fighters preferably with a transfer of technology whilst waiting for the operationalization of AMCA.

Furthermore, there is a shift taking place from manned to unmanned elements; to plug the combat potential degradation, six squadrons of UCAVs, should be procured by 2025-27 and the current 90 Israeli Herons should be upgraded to UCAVs and beyond visual range operations.

There is a need for the IAF to change its operational philosophy from manned to manned and unmanned teaming whilst using a large number of loitering mini, micro, and small Kamikaze drones preferably with high altitude capability. IAF needs to practice swarming missions with fighter aircraft operations. There is a need to work with indigenous private firms to manufacture these relatively cheaper smarter small drones in significant numbers. Further, even within UAVs, there would be the need of an appropriate combination of high, medium, and low altitude types. This would cross the fifth-generation hurdle without losing combat edge whilst simultaneously developing indigenous AMCA.

Keeping available funds in mind, by 2035, 10-11 Su-30 MKI, four Rafale, two stealth/FGFA, one upgraded Mir-2000, six Mk-1A/II LCA, two upgraded Jaguar and one upgraded Mig-29 squadron (total 26-27 squadrons) could be available to counter a two-front threat. To supplement numbers, UCAVs may be a cost-effective option; six squadrons of UCAVs with capability from high to medium altitudes need to be procured, besides a multitude of mini, micro, and small UAVs. To fight integrated multi-domain operations, all the UAVs and drones along with manned aircraft and AD systems should be maintained by the IAF to make effective employment of these assets as well as to make maintenance and operations more cost-effective. This would be a significant shift away from the current individual service-specific drone operations and air defence philosophy.

SpaceX plans to build a large constellation of nearly 12,000 satellites to provide worldwide, high-bandwidth internet service. The full constellation is expected to be operational by 2027. This constellation could provide cheap high bandwidth commercial internet services

WHAT DOES FUTURE PORTENDS?

The growing technical competence of commercial unmanned and space technology has bridged the gap between military and civilian air and space capabilities. Recognizing the huge opportunities presented by modern drones, India has come up with a new drone policy in 2022 that incorporates several initiatives that help leverage India's strengths to make India a global drone hub and help the private sector to extensively develop drones.

Commercial remote sensing and satellite communication companies are being increasingly utilized by the armed forces for military use. Ukraine was provided timely intelligence by commercial space agencies on Russian troop movements to keep their military communication networks operational under hostile conditions.

SpaceX plans to build a large constellation of nearly 12,000 satellites to provide worldwide, high-bandwidth internet service. The full constellation is expected to be operational by 2027. This constellation could provide cheap high bandwidth commercial internet services.

These developments indicate the emerging close partnership between the public and private sectors. It is here that private multinational integration with the Indian Air Force may help accelerate the modernization process to counter the Chinese challenge.

CONCLUSION

Emerging technologies have completely changed the character of air warfare. There is a shift taking place from manned to unmanned elements and missions combining manned and unmanned platforms, hence, there is a need to change our operational concepts to fight multi-domain integrated operations.

The IAF's optimum force structure for 2035, should progressively move towards fourth and fifth generation 26-27 fighter squadrons, additional five AWACS aircraft, appropriate Heavy Lift transporters, additional five upgraded S-400/S-500 AD (equivalent indigenous PAD BMD) systems and adequate numbers of attack and heavy lift helicopters whilst developing stealth capability.

To supplement numbers, force multipliers like UCAVs need to be procured; whilst developing swarm capability with mini, micro, and small UAVs.

Views expressed here are personal. ■

WE ARE DEALING WITH THE INTRUDERS IN A FIRM AND NON-ESCALATORY WAY

On the occasion of Army Day – January 15, Editor **Rohit Srivastava**, met with **Chief of Army Staff Gen Manoj Pande** and discussed variety of issues pertaining to the current and future challenges being faced by Indian Army.



INTERVIEW

IDI - What is the status of various Army restructuring plans? How much has the teeth-to-tail ratio improved?

CoAS - The environment in which we exist and operate continues to evolve, the character of war itself has witnessed transformative changes, riding on new concepts and innovative application of disruptive technologies. In addition, we are also witnessing threats manifesting in the Grey Zone, with a high deniability factor. This mandates a response, not only in the Kinetic domain, but also in the non-Kinetic domain.

Keeping in mind the changing character of warfare, some major structural transformation of our Armed Forces is in progress. I will focus only on the restructuring process that is currently underway in the Indian Army.

The Indian Army's initiative and efforts towards creation of Integrated Battle Groups is progressing well. The concept envisages restructuring of existing organisations into lean, agile, tailor-made and versatile entities with integral combat, combat support and logistics elements which can be launched in a compressed time-frame to achieve operational objective in a time-critical operational milieu.

Our defence strategy and doctrines are being constantly refined keeping in view the changing security paradigm in our immediate and extended neighbourhood, and the world at large. Infrastructure development, force restructuring and modernisation are being implemented accordingly.

In order to improve the teeth-to-tail ratio, the recommendations of the Committee of Experts (CoE) have been implemented. The strategic objective is to enhance our combat capability through modernisation and technological transformation while reducing the revenue defence expenditure.

Some measures such as doing away with Military Farms have already been implemented while many more are underway. These include disbandment of legacy organisations and structures like drawdown and optimisation of Animal Transport Units, Pioneer Corps, 3rd Line Transport and other such logistic functions.

Modernisation of equipment inventory is being achieved through procurement of state-of-the-art equipment from other countries as well as from the indigenous defence industry in pursuance of the 'Atmanirbhar Bharat' initiative.

IDI - Given the operational challenges being faced by the Indian Army in Ladakh and Line of Control(LC), how improved is the operational capability in the Northern Command?

CoAS - Indian Army has resolutely countered the adversary on the LC and the Line of Actual Control(LAC), carried out relentless Counter Insurgency/ Counter Terrorism operations and maintained high training standards. There is no let-up in our operational readiness along the LC, LAC, hinterland and the security of military establishments.

As far as Eastern Ladakh is concerned, the unilateral and provocative actions by the adversary to change the status quo by force, in more than one area on the LAC, have been responded in adequate measure. We are dealing with the intruders in a firm and non-escalatory way, ensuring the sanctity of our claims in Eastern Ladakh. We are well poised to counter any misadventure by our Northern adversary.



Based on the reviewed threat perception, re-balancing of forces has been carried out, in which re-orientation of forces to Northern Borders has been carried out, while retaining effective capability along the Western Front.

Development of requisite infrastructure to support operational and logistic requirements on the Northern Borders is being undertaken to include construction of critical roads and railway lines along with tunnels, construction / resuscitation of Airfields, Advanced Landing Grounds and Helipads to enhance connectivity in difficult terrain and weather conditions. Habitat for troops deployed in forward areas during the ongoing operational contingency is an important focus area.

There was also a felt need to upgrade ISR(intelligence, surveillance, reconnaissance) capability especially along the Northern Borders. Toward this, all weather ground and air / space based ISR capability for sustained durations at strategic / operational and tactical levels has been achieved and real time inputs from drone and satellite imagery are being made available at short notice.

Coming on to the addressing the situation in the UT of Jammu and Kashmir. The 'Whole of Government' approach adopted against the terror ecosystem and the consistent efforts of the Security Forces, the security situation in Jammu & Kashmir has seen progressive improvement. Well synergised, intelligence-based operations have resulted in significant successes and considerably degraded the terrorist leadership and their capabilities. Local recruitment is comparatively decreasing giving a serious blow to nefarious designs of Pakistan to "indigenise" the movement and fuel unrest in the Valley.

We have inducted niche tech and new generation equipment as part of ongoing capability development process. Infrastructure development activities are continuing in border areas in close coordination with civil administration. Emerging threats are being identified timely and steps are taken to enhance our capability to counter the same.

I would summarise by saying that adequate forces have been deployed in Northern Command in sync with envisaged threats. Capability building is an ongoing process which has been undertaken throughout Indian Army including Northern Command and is based on force modernisation and infrastructure development. Northern Command is fully capable of responding to any operational challenge.

In order to improve the teeth-to-tail ratio, the recommendations of the Committee of Experts (CoE) have been implemented. The strategic objective is to enhance our combat capability through modernisation and technological transformation while reducing the revenue defence expenditure



IDI - The world has witnessed the vulnerability of armour in recent conflicts like between Yemen-Saudi, Azerbaijan-Armenia and ongoing Russia-Ukraine. What is our Army's view on the effectiveness of armour in future conflicts?

CoAS - Every conflict is fought within a very specific geopolitical, regional and operational perspective and transposing lessons from one conflict to the other without adequately contextualising them may lead to incorrect strategies.

The tank is a formidable platform for undertaking land operations. Ever since the effectiveness of tanks in land battles was realised, its mobility, protection and fire power are constantly evolving and along with it; the counter measures to effectively counter the tanks are also evolving. There is a constant see-saw of development of armour and anti-armour weapons systems as well as techniques, tactics and practices. I see this as part of evolution of warfare.

The Armoured corps forms one of the most potent arms in any military and we are integrating it with a number of supplementary capabilities such as night enhancement, ATGMs, integrated surveillance and targeting system and swarm drones in order to enhance the effectiveness of the tank and ensure that it delivers a powerful punch to the adversary in any condition.

I must re-iterate that lessons from various conflicts are continuously being analysed and necessary steps are being taken in employment of various arms and platforms, including modifications in Tactics, Training and Procedures; wherever required.

As you are aware, we have recently received the approval for acceptance of necessity (AoN) to acquire 354 Light Tanks, each weighing less than 25 tonnes with a high power-to-weight ratio as well as superior firepower and protection.

Being lightweight, the light tanks can be quickly transported by air, land, and railway for rapid deployment to meet any urgent operational requirement. The tank will be driven by cutting-

edge technologies, including artificial intelligence, and will have drone integration, active protection system, and a high degree of situational awareness. It will also have missile and other weapon systems apart from the main gun.

IDI - The world is undergoing transition and realignment and as in the past, eras of transition were marred with large-scale conflicts, one can expect the same this time. Do you think it is still relevant for the Army to focus on CI/CT operations?

CoAS - The current security environment is marked by an assertive China, intransigent Pak, growing Sino-Pak collusiveness and continued role of non-state actors, which in sum, dictates that IA must always be prepared for full spectrum of conventional war. While the possibility of large scale conventional conflicts cannot be negated, world at large continues to witness Grey Zone Warfare.

Since your question was on focus of Indian Army, I must tell you that the Indian Army over the past few years is focused on progressively increasing our capabilities through optimisation of force levels, upgradation of technology, induction of Force Multipliers, as also modernisation and improvement of infrastructure.

Our capability development plans continue to be guided by identified operational requirements for prosecuting successful operations across the entire threat spectrum, be it conventional or non-conventional domains.

Force levels employed in Counter Insurgency / Counter Terrorist Operations are calibrated based on change in security situation on ground. Employment of tailor made forces like the Rashtriya Rifles ensures that our conventional capability is always maintained.

While the Indian Army continues to focus on conventional challenges along the Western and Northern Fronts, counter-terror forces like Rashtriya Rifles and Assam Rifles continue to undertake Counter Terrorist operations. Since national security is affected

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by both external and internal threats, Indian Army retains the capability to respond to both these threats.

I want to emphasise that what we are facing in the Kashmir Valley is not insurgency but a proxy war backed by the Pakistani military establishment. The Indian Army operates in areas in concert with the local law enforcement authorities as well as other central armed police forces (CAPFs).

In the North East, in most places, Armed Force Special Power Act (AFSPA) has been removed and the Indian Army has already reoriented to being deployed conventionally. While one needs to be prepared for conventional warfighting, it would be premature to pass judgment on the relevance of terrorism and low-intensity conflicts as an instrument of state policy for weak states like Pakistan.

IDI - Long-range rocket artillery and kamikaze drones are emerging as the preferential weapons for deep strikes over fighter jets. Armies are taking the lead over the Air Force in the deep strike, What is the Indian Army's plan for improving its deep strike capabilities?

CoAS- We are alive to the requirements of emerging battlefields. Enemy must be struck in depth of his territory to dislocate, disrupt and destroy his combat forces with an aim to break his will to fight even before he joins the battle. Accordingly, necessary steps are being taken to enhance our firepower and deep strike capability.

The Indian Army has the ammunition and weapon systems to target enemy's area in depth with precision strike with weapon systems such as Pinaka, including extended range ammunition and Smerch MLRS that can hit enemy targets at a depth of 75-90 km. This capability is being planned to be enhanced upto 300 kms in future through spiral development.

Brahmos missiles have the capacity to hit precision targets at a range of 400 km. Induction of more long range conventional missile systems like the "Pralay" is also under consideration, which will considerably enhance our ability to strike enemy in depth areas.

Indian Army is also looking at induction of Loiter Munitions and Swarm Drones with variety of War Heads that will not only enhance our ability to carry out surveillance but will also enhance our precision strike capability.

Artillery modernisation is expected to pick up pace with indigenous capabilities being developed by our industry. With

The Armoured corps forms one of the most potent arms in any military and we are integrating it with a number of supplementary capabilities such as night enhancement, ATGMs, integrated surveillance and targeting system and swarm drones in order to enhance the effectiveness of the tank and ensure that it delivers a powerful punch to the adversary in any condition

proven capability of indigenous gun production, mediumisation of Indian Artillery will result in quantum leap in the devastating fire power that can be delivered onto the enemy with speed and accuracy at extended ranges.

In the future, the induction of a modern Towed Gun Systems and Mounted Gun Systems will improve the edge of this Arm against our adversaries.

IDI-The emerging trends in warfare would require new equipment profile and new command and control structure and probably new training manuals. What is the Indian Army's take on this?

CoAS- The Indian Army focussed on ensuring the highest standard of operational preparedness through training, force modernisation and capability development to meet current and emerging challenges. We are working towards training for integrated operations in present and future wars which are going to be network centric in a highly complex and 'VUCA' (volatile, uncertain, complex and ambiguous) environment.

The application of forces to contest our security challenges in the military domain will need joint structures. We will have to train and develop our leadership accordingly, for integrated operations for future wars.

We are also undertaking various studies to derive lessons on relevant aspects from recent conflicts and emerging warfare trends, including the Russia-Ukraine conflict, and these are being assimilated into our training. Accordingly, our Techniques, Tactics and Procedures are being refined so that the rank and file remain prepared for the future battlefield.

A Change Management Philosophy document in English and Hindi has been issued to addresses senior leadership for managing aspects at apex and policy level and junior leadership at the functional and implementation level of the Change.

Special focus has been devoted to train on New Generation Equipment (NGE) with a view to developing core teams, instructional material and training aggregates to ensure optimum exploitation of New Generation Equipment.

The technical threshold of all ranks is being enhanced to facilitate ease of technology infusion. Technical awareness of current and emerging disruptive technologies like robotics, Artificial Intelligence, Swarming, Cyber, Nano technology, Big Data analysis, Space applications and so-on are being addressed through institutionalised interventions.

The induction of Agniveers will lead to a much more technically oriented, young and proficient force. We are inducting modern technology such as simulators, Augmented Reality (AR), Virtual Reality (VR), etc for accelerating training and increasing technical assimilation / training.

Language training is another aspect which is receiving our attention.

We have introduced a unique and standardised Unarmed Combat art form named 'Army Martial Arts Routine (AMAR)'. This art form which is specifically designed is high on offensive assault training and is also effective against sharp edged and improvised weapons. This will train soldiers in basic and advanced techniques of mixed martial arts manoeuvres.

We are also looking at diffusing technologies for specific tasks and capabilities such as lethality, ISR, night enhancement, stealth, mobility and AI-enabled systems. The intention is to enable the cutting edge ie the units and subsequently small teams to take actions as per the dynamic battlefield scenario.



We are looking at integrated training on joint processes with the three Services in our path to achieve jointness in the operational and administrative domains.

IDI-In your assessment, is the Army Design Bureau performing to the army's satisfaction?

CoAS - The raising of the Army Design Bureau (ADB) has been a game changer. In its few years of raising, it has achieved tremendous traction with the Indigenous Defence Industry especially the MSMEs, Start Ups, R&D organisations both public and private, as well as the Academia i.e. IITs / IISc. Aligning and connecting the capabilities of the Industry with the User's requirements has been the mantra and has already led to big strides towards Atmanirbharta in Defence.

ADB has provided the means to the Indian Army to scout for technology and enable its adoption. The capability demonstrations organised by the ADB has manifested in the procurement of 09 products (worth 1,400 Cr) while another 12 products (worth 5,000 Cr) are in various stages of procurement. Additionally, during the recent Emergency Procurements, it was the Army Design Bureau that spearheaded the identification and induction of niche technology solutions like surveillance/ swarm drones, variants of specialist vehicles, loitering ammunition etc.

With a view to have a capable and robust defence technology infrastructure for 'Self-sufficiency through Indigenisation,' ADB is also pursuing numerous R&D/ design and development initiatives of the Indian Army and is currently handling more than 150 different such projects. In the last 3-4 years, ADB has initiated nearly 100 projects through the Make, iDEX, Technology Development Fund and Army Technology Board initiatives. Their relentless efforts in pursuing these initiatives are already seeing tremendous success wherein RFP has already been issued for 06 products developed

through the iDEX route while contract has been signed for 01 project (MEAT) through Make route and contract for another Make project (UATW) will be signed shortly. The recent forays of ADB to sign a MoU with BEL to jointly develop AI enabled solutions for the Indian Army as also with Drone Federation of India to develop drone solutions for the Indian Army are the first of their kind.

We have a well worked out road map for enhancing the range of activities that the ADB will be undertaking.

An extensive outreach conducted by the ADB has already mapped 850+ industries, contacted 200+ top academic institutions and more than 50 top R&D organisations in the country. To further enhance the ADB footprint and facilitate easier contact for industry/ R&D organisations and academia, Regional Technology Nodes have already been established in Pune and Bengaluru while Indian Army Cells have been established at IIT Delhi with two more being established shortly in IIT Kanpur and IISc, Bengaluru.

ADB is also regularly releasing Problem Definition Statements that provide an insight to the industry to provide solutions to address the needs of the field army. The latest compendium of problem statements addressing niche domains like AI, blockchain, robotics, UGVs, UAVs, Counter UAVs etc is also being released shortly.

I must also highlight that the ADB has not just restricted itself to the Indian Army but has also gone a step further to assist the defence industry by assisting them in developing and testing their products. The opening of the ranges to civilian industry, access to in service equipment, coordinating visit of industry representatives to forward areas, provisioning of ammunition etc have all been facilitated by ADB.

With all this being done, Army Design Bureau has proved itself to be the vital cog, as the Indian Army embarks on a technological transformation. I am sanguine that in the future the contributions of Army Design Bureau will increase by leaps and bounds. ■

MAIDEN LANDING OF FIGHTER ON INS VIKRANT

by **IDI BUREAU**

The successful landing and take off of the indigenous LCA Navy on India's first Indigenous Aircraft Carrier is a momentous step forward towards the realisation of our collective vision of AatmaNirbharBharat. The maiden landing of the Mig-29K also heralds the integration of the fighter aircraft with INS Vikrant. Congratulations to all those who made it happen." - Adm R Hari Kumar,

Chief of the Naval Staff

INS Vikrant is the first indigenous Aircraft Carrier and the most complex warship ever built by our country. It is a matter of pride that the ship has been designed in-house by Indian Navy's Warship Design Bureau and constructed by M/s Cochin Shipyard Limited. The ship had sailed for maiden Sea Trials on August 4, 21. Since then, she has undergone sea sorties for trials of Main Propulsion, Power Generation equipment, Fire Fighting systems, Aviation Facility Complex equipment etc. The Carrier was commissioned into the Indian Navy on September 2, last year, Prime Minister Narendra Modi was the Chief Guest.

The construction of the Carrier is a big boost to the 'AatmaNirbhar Bharat' vision of the Government of India. The Carrier has been undertaking extensive Air Operations with Rotary Wing and Fixed Wing aircraft since 13 December 13, towards Air Certification and Flight Integration Trials for achieving the ultimate aim of being 'Combat Ready'. As part of the aviation trials, landing of LCA (Navy) and MiG-29K onboard INS Vikrant was carried out by Indian Naval Test Pilots on February 6.



The landing of LCA(Navy) on deck has demonstrated 'AatmaNirbharta' in India's capability to design, develop, construct and operate indigenous Aircraft Carrier with indigenous Fighter Aircraft. It is indeed a landmark achievement being the first time that trials of a prototype aircraft - indigenously designed & produced by Aeronautical Development Agency (ADA) & Hindustan Aeronautics Limited (HAL), has been successfully undertaken on an indigenous Aircraft Carrier. Further, the landing of MiG-29K onboard INS Vikrant is also a significant achievement as it marks the successful integration of the aircraft with the indigenous carrier as well as further enhances the Combat Readiness of the Navy. ■



WARFARE

GEOPOLITICAL TRENDS AND THE FUTURE OF WARFARE

India must revise its strategy for confronting external threats and re-examine the tools and resources it will need to fight future wars.

by **RAKESH KRISHNAN SIMHA**



WARFARE

If history has taught us anything it is that war is constant. But the way war is fought has evolved with time. Since the Peace of Westphalia in 1648 - when modern nation-states were recognised in Europe - wars have been fought among nations. After the development of nuclear weapons, wars were often fought by proxies because the two superpowers could no longer fight each other directly. In recent decades, proxy war has evolved into hybrid warfare - a full-spectrum conflict that can include military, diplomatic, economic, social, informational, technological and other actions to achieve strategic objectives.

To illustrate, the war in Yemen is a proxy war between Saudi Arabia and Iran, and the Ukraine War is a full-scale hybrid war between two blocs - US + Europe versus Russia + China. India has also been a victim of proxy wars - Pakistan waging a war of a "Thousand Cuts" via Khalistani and Islamic terrorist groups; and China using Pakistan as a proxy to tie down India in a subcontinental fratricide.

According to NATO Review, hybrid warfare below the threshold of war or direct overt violence pays dividends despite being easier, cheaper, and less risky than kinetic operations. "It is much more feasible to sponsor and fan disinformation in collaboration with non-state actors than it is to roll tanks into another country's territory or scramble fighter jets into its airspace. The costs and risks are markedly less, but the damage is real."

The war in Iraq cost \$2.4 trillion to execute and the final bill for the Afghanistan War is \$2.1 trillion. Says NATO Review: "With the cost of war ratcheting up and newer tools being at the disposal of states, the will to fight all-out wars might be diminishing. This, however, does not herald the waning of conflicts but changes the dynamics of war. It is against this backdrop that states are increasingly resorting to hybrid warfare below the threshold of an armed conflict in pursuance of their zero-sum security goals. In a nutshell, the overall security environment is radically changing despite the nature of conflict remaining the same."

A key aspect of hybrid warfare is that it can be sustained for years, keeping the adversary on the defensive without getting one's hands dirty. The US has been doing this in Ukraine since 2014 to keep Russia's western border on the boil and tie down Moscow in Eastern Europe. At least in the short term, it won't cost the Americans much in terms of men, material and money.

To understand the implications for India in this transformed geopolitical landscape, we must first take a dive into how we got here.

WEST HITS A DEAD END

Over the previous 400 years, the West was able to attain a preeminent position by invading and colonising countries, and using their wealth and slave labour to kickstart the Industrial Revolution (1750-1840 CE). This resulted in Western countries achieving unprecedented levels of prosperity along with huge advances in military technology.

However, this scenario no longer operates because the rest of the world is now getting wealthier and stronger, and has easy access to advanced technology. The concept of a "World Without the West" was first articulated in 2007 by American academics Steven Weber, Naazneen Barma and Ely Ratner who wrote: "For the first time in a century, a set of large, populous and increasingly wealthy states - this time China, India and Russia - are on the cusp of achieving great-power status." These rising powers are keen to break the dominance of the current order by increasingly "routing around" the West.

Most of the changes in war fighting will be at the tactical level where the use of hand-launched miniature spy and attack drones have transformed the battlefield

For years the East vs West debate has been framed largely in terms of whether emerging powers will integrate into or challenge the existing international system built by the West. Weber and his associates contend rising powers are opting for neither. "By preferentially deepening their own ties among themselves, and in so doing loosening relatively the

ties that bind them to the international system centred in the West, rising powers are building an alternative system of international politics whose endpoint is neither conflict nor assimilation with the West," they say.

This works in two ways. One, the rising powers deepen their trade, defence and cultural ties among themselves, creating a new parallel international system. So in effect, by not playing by the rules set by the West they are creating an alternative arrangement in which they neither enter into conflict situations with the West nor enter into subservient alliances (like those offered to South Korea and Japan).

Crucially, the developing world is routing around not just the West but also the idea of the West, making it increasingly difficult for Western narratives to penetrate the developing world. This makes the West simply irrelevant. As emerging economies grow in size, it gives them the critical mass to lay down the foundations of a new system that is autonomous from the Western international order.

HOW DOES THIS IMPACT CONFLICT GLOBALLY?

From a Western standpoint, a "World Without the West" must never happen. The US and its Western allies will never willingly allow the reins of the global economic system to be yanked from their hands. As the West gets weaker, it will resort to warfare by other means including economic and proxy. While the West is at present not our adversary, they are also not our civilisational ally. This is precisely the reason the West won't allow Pakistan to collapse, and in fact, keeps propping it up economically and militarily as a hedge against India.

The Ukraine playbook is likely to become the West's go-to strategy to deal with countries that threaten its current position. War-related sanctions have already impacted the Russian economy, which has contracted by two per cent over the past year. Similarly, sanctions have impacted the economies of North Korea, Cuba, Venezuela, Iran and Iraq. Each of these countries was at loggerheads with Washington when they got sanctions slapped on them. Interestingly, Pakistan - which has a long history of exporting terror and attacking Western military and civilian targets - has never faced sanctions because it is willing to be a Western stooge.

India is squarely in the West's crosshairs. In 2014, the Intelligence Bureau submitted a report to Prime Minister Narendra Modi, identifying several foreign-funded NGOs that were negatively impacting economic development. The 21-page IB report revealed: "A significant number of Indian NGOs, funded by some donors based in the US, UK, Germany, the Netherlands and Scandinavian

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countries, are using people-centric issues to create an environment which lends itself to stalling development projects.”

The report added: “Foreign donors lead local NGOs to provide field reports which are used to build a record against India and serve as tools for the strategic foreign policy interests of the Western government.” If the IB’s contention that NGOs drag down economic growth by 2-3% is true, then the total national loss in 2014 was as much as \$60 billion – greater than France’s defence budget.

The economic strangulation of countries opposed to the West would be the opening salvo of future wars.

THE 0.5 IN 2.5 FRONT WAR

While the West could be a long-term rival, the current existential threat to India is from its jihadi and communist neighbours. China waged one full-scale war against India (in 1962) and Pakistan launched four wars (1948, 1965, 1971 and 1999) in just 52 years. While there has been intense debate on the possibility of a collusive two-front attack on India, the more likely scenario is that these two countries will utilise India’s internal enemies to wreak havoc from within. This is why it’s called a 2.5-front war, with China (1) and Pakistan (2) using the internal fifth column (0.5) comprising Islamists, urban naxals, Maoists, Khalistanis, communists, leftists, seculars and missionaries.

Given the significant costs of engaging India in combat, and the growing range of indirect and non-military tools at their disposal, both Pakistan and China are seeking ways to achieve relative gains without triggering escalation. From fake news and online troll

If there is a takeaway from the Ukraine War it is that there is no substitute for an overwhelming assault on enemy forces

farms to terrorist financing and paramilitary provocations, these approaches often lie in the contested arena somewhere between routine statecraft and open warfare – the “grey zone”.

According to the Center for Strategic & International Studies, “The grey zone phenomenon is also referred to as hybrid threats, sharp power, political warfare, malign influence, irregular warfare, and modern deterrence. Although it reflects an age-old approach, it is newly broad in its application. Today, the toolkit for coercion below the level of direct warfare includes information operations, political coercion, economic coercion, cyber operations, proxy support, and provocation by state-controlled forces.”

Peter Layton of the Lowy Institute writes that grey zone actions don’t just happen. “China, for example, has implemented a well-orchestrated campaign approved and controlled by the highest levels of the Chinese Communist Party and the People’s Liberation Army. Grey zone actions are not those of tactical commanders freelancing. They are purposefully constructed to side-step military escalation – crafted as a form of carefully scripted brinkmanship.”

Layton identified China as the “largest country undertaking grey



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zone actions". Whether in the South China Sea, the East China Sea or on its border with India, China has employed innovative and imaginative grey zone tactics in its quest for a persistent strategic advantage over others, he writes.

Pakistan has learned well from its master. Pakistani author and columnist F.S. Aijazuddin reveals that in the early 1960s Chinese Premier Zhou-Enlai had travelled to Pakistan and suggested to President Ayub Khan that Islamabad should prepare for a prolonged conflict with India instead of short-term wars, and raise a militia force to act behind Indian lines. Heeding China's advice, the Pakistanis went on to create terrorist groups like the Lashkar to wage an undeclared war against India. Today, the fingerprints of Pakistan's secret service ISI are found at every terror attack in India.

WILL TRADITIONAL WAR FIGHTING CHANGE?

Several military observers in the West have gone to town over the recent Russian setbacks in the Ukraine War. The Western media is as usual spinning out articles on how Ukraine changes everything; how tanks are obsolete; how artillery is outdated and so on.

The truth is Russia made the strategic mistake of going in without large-scale military mobilisation and avoided the saturation bombing of the Ukrainian political HQ, thereby allowing the joker Zelensky and his Neo-Nazi thugs to keep fighting.

Since the three-axis invasion of Ukraine began in February, the Russians have avoided going in with all guns blazing. Unlike the West, which bombed Iraq in 2003 with unstoppable 1,000 bomber raids and dismantled Saddam Hussain's high command within 48 hours, Moscow did not follow the classic Russian strategy of swift offensive operations despite having the ability to do so. Rather, the plan was to seize the southern and eastern Russian-speaking regions and bring the Ukrainians to the negotiating table.

The mistake in strategy was due to the Russian belief that Ukraine - being a fellow Slavic nation - should not be crushed. As a result, Kiev was spared crippling blows on its political command centres.

If there is a takeaway from the Ukraine War it is that there is no substitute for an overwhelming assault on enemy forces. The one sector where Russian forces notched up early and notable success was in the south, near Crimea, where the Russian Army was led by General Aleksandr Dvornikov, described as an "old school" general and a "blood and soil nationalist". Trained in Soviet military doctrines of quickly obliterating the adversary as a means of gaining battlefield momentum, Dvornikov is the only commander who disregarded Putin's orders to fight a limited war. Ironically, he was relieved of his command, a pointer that not all is well in the Russian leadership.

A mistake in strategy cannot be undone in the same war, and any military that makes such unpardonable mistakes as the Russians will find the rest of the war an uphill task. If India is to launch a war

Whether in the South China Sea, the East China Sea or on its border with India, China has employed innovative and imaginative grey zone tactics in its quest for a persistent strategic advantage over others



it should not be limited but total. Limited war has limited success as we are seeing in Ukraine.

In fact, the importance of timing in the execution of military operations has been a constant refrain in the works of military strategists through the ages. Prussian general and military strategist Carl von Clausewitz (1780-1831) wrote in 'On War' that time is less likely to bring favour to the victor than to the vanquished. "An offensive war requires above all a quick, irresistible decision. Any kind of interruption, pause or suspension of activity is inconsistent with the nature of offensive war." More than 2,300 years ago, Chanakya, the strategist of the Mauryan Empire, wrote in The Arthashastra: "Whenever the king is superior, he shall not waste any time and should proceed against the enemy whenever by doing so the enemy can be weakened or crushed."

FOCUS ON TACTICS

Rather than a major strategic transformation, most of the changes in war fighting will be at the tactical level where the use of hand-launched miniature spy and attack drones have transformed the battlefield. Countries that are nimble enough to quickly equip their soldiers and commanders with battlefield drones and feed them timely intelligence will have the tactical advantage. The impact of artillery regiments will be manifold when they work closely with swarms of smart drones identifying enemy troop and armour concentrations in real-time.

Ukrainian writer Roman Shemakov says the war in Ukraine is the latest instance in which control of telecommunication played a critical role. "In 2015, before the annexation of Crimea, Russian forces occupied the main ISP offices of the peninsula, severed all connections into Ukraine, built a new undersea fibre optic cable, and rerouted internet traffic through Moscow-based Miranda Media. This ensured that local internet traffic would be monitored by Roskomnadzor, Russia's telecommunication regulator, and subjected Crimean residents to Russian speech, publishing, and internet regulations."

Had the Russians conducted their February 2022 military operations with such clinical precision and clarity of mind, they would not be stuck in a standoff with the much smaller Ukrainian military.

Clearly, the modern battlefield is not limited to the physical space anymore but extends across the entire spectrum. Countries that control this spectrum will emerge victorious. ■

INS VAGIR COMMISSIONED

On January 23, INS Vagir, the fifth P75 Kalvari-class submarines, was commissioned within the Indian Navy in presence of the Chief of Naval Staff, Admiral R Hari Kumar and several other senior dignitaries.

by **IDI BUREAU**





INS Vagir is built by Indian shipyard Mazagon Dock Shipbuilders Limited (MDL) based on the Naval Group Scorpene® design.

Launched on 12 November 2020, INS Vagir successfully completed all her sea trials and now enters into service within the Indian Navy. She will join INS Kalvari, INS Khanderi, INS Karanj and INS Vela which had already been commissioned respectively in December 2017, September 2019, March 2021 and November 2021. The last submarine of the P75 series, the Vagsheer, is currently completing her sea trials in order to be delivered in 2024.

Speaking on the occasion CNS stated that INS Vagir will give a significant fillip to the Indian Navy's operational might and serve as a potent deterrent for any adversary.

He also highlighted that Vagir is the third submarine inducted into the Navy in a short span of 24 months. "This underscores the coming of age of India's shipbuilding industry, and the maturing of our defence ecosystem. It is also a shining testimony to the expertise and experience of our shipyards to construct complex & complicated platforms and serves to reinforce Indian Navy's unequivocal commitment and steadfast resolve to be a fully 'AatmaNirbhar' force by 2047."

Congratulating the CMD and personnel of Mazagon Dock Shipbuilders Ltd for their commendable efforts which have led up to Vagir's commissioning CNS stated that MDL is a close and valued partner for the Indian Navy & has been at the forefront of Navy's transition from a 'Buyer's Navy' to a 'Builder's Navy'.

The CNS complimented the Commissioning Crew stating that "it gives me every confidence that each one of you will 'do your duty and do it well', and that Vagir will serve the Nation with pride and élan guided by the highest traditions of the Navy".

Laurent Espinasse, EVP Submarines said: "The commissioning of INS Vagir is a major milestone for the Indian Navy, MDL, Naval

Group and all our industrial partners. We are proud to be part of the P75 program and remain fully committed to deliver the last unit of the series and to enhance the level of indigenisation in future projects of the Indian Navy."

The commissioning of INS Vagir highlights the success of indigenous submarines construction programme of the Government of India. This submarine has been completely built by MDL having successfully absorbed the technology transfer from Naval Group, in line with Indian Government's "Make in India" policy. The series of six submarines of the P75 program is fitted with a number of equipment built in India by qualified and highly trained industrial Micro, Small & Medium Enterprises (MSMEs). MDL and Naval Group have developed a rich industrial ecosystem of more than 50 Indian companies, along with an Indian subsidiary with more than 70 Indian engineers to support Indian Navy, thus contributing to industrial and technological sovereignty.

THE SCORPENE

The Scorpene® is a 2000 tons conventional-propulsion submarine designed and developed by Naval Group for all types of mission, such as surface vessel warfare, anti-submarine warfare, long-range strikes, special operations or intelligence gathering. Extremely stealthy and fast, it has a level of operating automation that allows a limited number of crew, which reduces its operating costs significantly. Its combat edge is highlighted by the fact that it has 6 weapon launching tubes and 18 weapons (torpedoes, missiles).

Naval Group is present in India through its 100% subsidiary Naval Group India. Established in September 2008, Naval Group India's mission has been to support the indigenisation of equipment for Scorpene® submarine, to develop the Indian defence ecosystem, as well as to develop design services in India with talented Indian engineers. ■

SILENT CHALLENGES TO SELF-RELIANCE IN UAS

The rise of Iran and Turkey as a drone power is one of the major developments of recent times. India which claims to be a regional power is way behind both the countries in this area

by **GP CAPT (DR) RK NARANG (RETD)**

Ever since taking over as Prime Minister (PM) in 2014, Narendra Modi has explored various options and left no stone unturned to make India self-reliant in critical technologies. The launch of 'AtmanirbharBharat' (self-reliant India) mission and the addition of 'Jai Anusandhan' (research) in the slogan 'Jai Jawan, Jai Kisan and Jai Vigyan' indicate his earnest desire to make India self-reliant in critical technologies. The drone or Unmanned Aerial Systems (UAS) industry finds a special place in India's self-reliance mission as it has set the target of becoming the global drone hub by 2030. His endeavours were ably supported with the introduction of a number of policy reforms to boost civil drone manufacturing and adoption in commercial applications such as liberal drone rules-2021, Productivity Linked Incentive (PLI) scheme, banning of import of drones, farmer drones and Drone As A Service, etc. These reforms have made a positive impact on the growth of the Indian drone industry and must be lauded.

At the same time, Indian drone manufacturing is facing silent challenges as the drone technology development trajectory has certain critical gaps that need to be filled to make India self-reliant in the most promising UAS technology. I call it silent challenges as much faith is placed on the past policy reforms while four critical factors that could adversely but silently impact its trajectory to self-reliance remain unattended; i.e. the absence of technological initiatives, lack of technological ownership, rapid procurement without sticking to the basic principle of self-reliance and leadership.

India unlike the US, European Union and China has not taken technology initiatives such as the development of UAS Traffic Management (UTM), real-time identification and tracking, detect and avoid systems, command and control systems, light weight sensors and other payloads to fill drone manufacturing gaps and integration of drones in the Indian national airspace. India is dependent on China and other countries for drone components and technologies that have inherent vulnerabilities and undesirable dependencies. Also, the absence of technology development

initiatives could harm the interoperability of drones being procured and manufactured for commercial and military sectors.

Drone technology ownership is one of the most important challenges to India's mission (aspiration) for self-reliance in drone technology. In the civil drone sector, lack of ownership of drone manufacturing technology is leading to incoherence in research and technology development and a lack of focus in filling the critical drone manufacturing technology and airspace integration gaps as deliberated above.

In the military drone sector, India's most critical indigenous technology development programs like Rustom-I tactical ISR drone (close to TB-2 class of drone), TAPAS Medium Altitude Long Range (MALE), Ghatak - Unmanned Combat Aerial Vehicle (UCAV) and Non-afterburner Kaveri engine development programs also suffer from technology ownership challenges.

There is silence on the amount of budget allocation, timelines

India is dependent on China and other countries for drone components and technologies that have inherent vulnerabilities and undesirable dependencies. Also, the absence of technology development initiatives could harm the interoperability of drones being procured and manufactured for commercial and military sectors



for development and ownership of stakeholders. In the absence of timely budget allocation, no project can be blamed for delays. The absence of ownership contributes to delays, the retirement of scientists, cost escalations and technology obsolescence. This later translates into public trials for delays in indigenous programs but does not help the country in becoming self-reliant, which is the prime goal of this government.

Procurement is the most crucial element of self-reliance in drone technology as it can make or break India's indigenous innovation and drone manufacturing capability. The innovations in drone technologies and innovative employment of commercial drones, loitering munitions and other military drones have played a major role in Azerbaijan-Armenia, Russia-Ukraine and other recent wars and conflicts.

The rise of China as a major UAS power, China-Pakistan and Turkey-Pakistan collaboration in UAS technologies is posing new challenges for India. India's economic realities and a limited budget for capital procurement necessitate research led approach to become self-reliant in UAS technologies that would make India self-reliant in defence UAS technologies with significant gains for commercial drone manufacturing industry, agriculture, mining, power, and infrastructure building. Everyone in India is unanimous that drones would play a critical role in future wars and users are resorting to rapid procurements under emergency powers to fill these critical drone technology gaps. Similarly, some of the other ministries and state governments are also overlooking or not stipulating indigenously designed, developed and manufactured (IDDM) drones as a mandatory requirement during the procurement of drones and hiring of drone services. The rapid procurement and hiring of drone services without sticking to the core principle of self-reliance can silently but certainly derail India's mission for building research-led self-reliant drone manufacturing. The Request for Procurements (RFPs) placing large orders, short delivery time, demand minimum annual turnover for the last past financial years from a startup or MSMEs.

The financial requirements, faster delivery timelines and large orders are understood considering urgencies, financial allocation and other challenges faced by users. However, it is in these trying

circumstances the role, ownership and commitment of the leadership in various Ministries and organisations in the capability building of the nation is tested. Following orders and rules make one complaint but not a leader who is committed to making India self-reliant in critical technologies that include civil and military drone technologies. Leadership is of utmost importance for building niche and innovative drone technologies and domestic manufacturing potential.

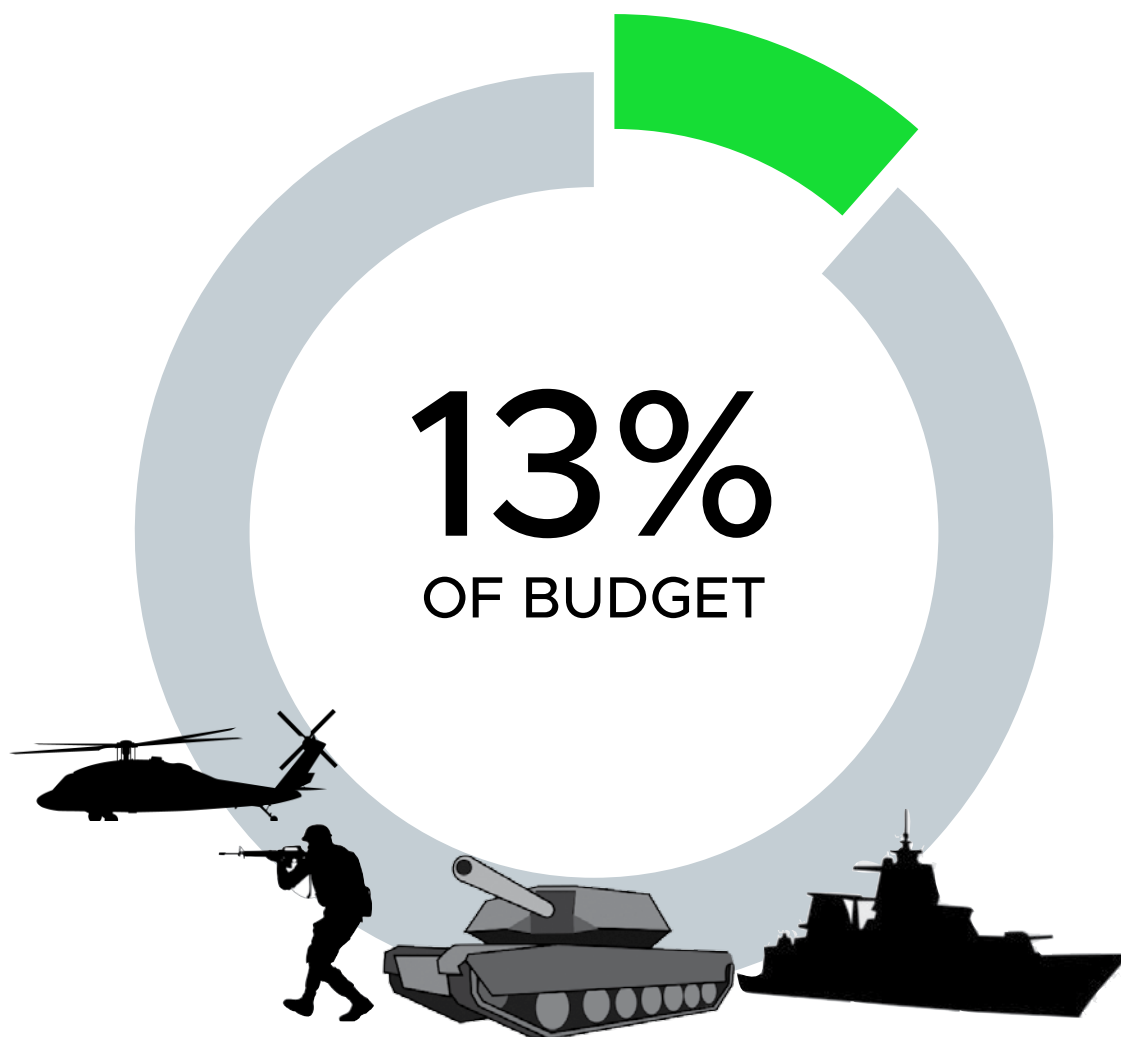
History is replete with examples in which so few have ruled countries with large populations and militaries and India needs leadership to change its trajectory. A few of the measures needed for overcoming silent challenges to self-reliance in UAS as follows:

- (a) Study global technology initiatives, Identify specific technology and capability gaps in the UAS industry and launch technology development initiatives to bridge these gaps
- (b) Define ownership and responsibilities of stakeholders, timelines for the development, testing, operationalisation and induction of Archer, TAPAS, Ghatak and Kaveri non-afterburner aero-engine for UCAV, allocate appropriate funds while ensuring that critical technology gaps are identified and plan is made to fill these gaps.
- (c) Introduce procurement of IDDM UAS by all Ministries
- (d) Sensitise Government functionaries involved in Procurement/RFPs and issue suitable guidelines for making QRs, timelines and other conditions to support IDDM and start-ups, MSMEs and Indian companies.
- (e) Sensitise, guide and train leadership to understand nuances, follies and gaps in current design, development and procurement systems to take necessary measures to support self-reliance in UAS

The technological initiatives, technological ownership, aligning procurement with self-reliance and leadership are the four critical factors that would determine the trajectory of self-reliance in UAS and timely corrective measures can help India in achieving the challenging goals of becoming Atmanirbhar, a global drone hub by 2030 and advanced nation in drone technology by the 100 years of independence in 2047. ■

INDIA ALLOCATES 13 PER CENT OF BUDGET FOR DEFENCE

by **IDI BUREAU**



BUDGET

India, for the next financial year, allocated 13 per cent of its national budget towards defence expenses. The allocations for border infrastructure and innovation fund received 43 and 93 per cent jump respectively. India has also earmarked one third of its revenue expenditure for operational expenses which is almost 44 per cent higher than the last financial year.

Highlighting the major allocations, Defence Minister Rajnath Singh, in tweets, said, "The Union Budget for the Financial Year 2023-24 envisages a total outlay of Rs. 45,03,097 Crore. Of this, Ministry of Defence has been allocated a total Budget of Rs 5,93,537.64 Crore, which is 13.18 per cent of the total Budget."

Speaking further, he added, "operational allocation gets a boost of Rs 27,570 Crore, with the budgetary outlay under this segment augmented from Rs 62,431 Crore (current financial year) to Rs 90,000 crore in (budget) 2023-24.

This expenditure is expected to close critical gaps in the combat capabilities and equip the Forces in terms of ammunition, sustenance of weapons and assets, military reserves etc. This will cater to sustenance of Weapon Systems, Platforms including Ships/Aircrafts and their logistics; boost fleet serviceability; emergency procurement of critical ammunition and spares; procuring/hiring of niche capabilities to mitigate capability gaps wherever required; progress stocking of military reserves, strengthening forward defences, amongst others.

The Union Budget for Financial Year 2023-24 envisages a total outlay of Rs 45,03,097 crore. Of this, Ministry of Defence has been allocated a total Budget of Rs 5,93,537.64 crore, which is 13.18 per cent of the total budget. This includes an amount of Rs 1,38,205 crore for Defence Pensions. The total Defence Budget represents an enhancement of Rs 68,371.49 crore (13per cent) over the Budget of 2022-23.

As a precursor to this increase in the Non-Salary Revenue segment, the government during the Mid-term review had also enhanced the operational allotments of the current financial year by Rs 26,000 crore, which works out as 42 per cent of the present allocation. This unprecedented increase in the Revised Estimates 2022-23 has ensured liquidation of the entire carry over liabilities during the current year thereby ensuring that there is no dent in the next year's operational outlay of the Services.

The enhanced allocations in the Budget will also cater to Training Aids and Simulators for Agniveers and ensure that they achieve the set standards of training for induction in the Defence Forces.

THRUST ON MODERNISATION

Accordingly, the Capital Allocations pertaining to modernisation and infrastructure development of the Defence Services has been increased to Rs 1,62,600 crore representing a rise of Rs 10,230 crore (6.7per cent) over FY 2022-23. Also, the increase in the Capital Budget since 2019-20 has been Rs 59,200 crore (57per cent). This increase is a reflection of the Government's commitment towards sustainable augmentation in the area of modernisation and infrastructure development of the Defence Services.

"MoD is committed towards infrastructure strengthening in the Border Areas, particularly the Northern Borders,"

Highlight

1. Defence gets Rs 5.94 lakh crore in Budget 2023-24, a jump of 13per cent over previous year
2. Operational allocation of the Armed Forces gets unprecedented jump
3. Capital outlay pertaining to modernisation and infrastructure development increased to Rs 1.62 lakh crore; 57per cent rise since 2019-20
4. Capital Budget of BRO enhanced by 43per cent to Rs 5,000 crore; At Rs 23,264 crore, allocation to DRDO increased by 9per cent
5. iDEX gets Rs 116 crore, an enhancement of 93per cent over 2022-23, to further foster innovation

BORDER INFRASTRUCTURE

Accordingly, the Capital Budget of Border Roads Organisation (BRO) has been increased by 43 per cent to Rs 5,000 crore in FY 2023-24 as against Rs 3,500 crore in FY 2022-23. Also, the allocation under this segment has doubled in two years since FY 2021-22. This will boost the Border infrastructure thereby creating strategically important assets like Sela Tunnel, Nechipu Tunnel and Sela-Chhabrela Tunnel and will also enhance border connectivity.

"MoD is committed towards infrastructure strengthening in the Border Areas, particularly the Northern Borders," the minister added.

INDIA'S MISSION OF AATMANIRBHARTA

Towards strengthening Research and Development in Defence, the allocation to DRDO has been enhanced by 9per cent, with a total allocation of Rs 23,264 crore in BE 2023-24.

To further foster innovation, encourage technology development and strengthen the Defence Industrial ecosystem in the country, iDEX and DTIS have been allocated Rs 116 crore and Rs 45 crore respectively representing an enhancement of 93per cent for iDEX and 95per cent for DTIS over 2022-23. This will fulfill the Ministry of Defence's vision to leverage ideas from bright young minds across the country.

The Union Budget 2023-24 has announced a National Data Governance Policy to unleash innovation and research by start-ups and academia. This will enable access to anonymized data which will further boost the Defence Start-ups and iDEX scheme.

The Union Budget 2023-24 has also announced that the revamped Credit Guarantee scheme for MSMEs which will take effect from 1st April 2023 through infusion of Rs. 9,000 Crore in the corpus. This will enable additional collateral-free guaranteed credit of Rs 2 lakh crore. Further, the cost of the credit has also been reduced by about 1 per cent. This scheme will give a further fillip to the MSMEs associated with the Defence Sector. ■

BEL IS FAST EXPANDING ITS GLOBAL PRESENCE

As part of our coverage of Aero India, **Rohit Srivastava**, Editor, GeoStrategy had long discussion with **Bhanu Prakash Srivastava**, CMD, BEL, on various aspects of his company's performance and future plans, some excerpts-



AEROINDIA'23

ON AERO INDIA

CMD - BEL will showcase state-of-the-art products and systems spanning every domain of its business at the 14th edition of Aero India 2023. The products and systems to be on display have been clustered as 'Communication', 'Electro-Optics and Laser', 'EW and Avionics', 'Homeland Security & Smart Cities', 'Medical Electronics', 'Naval Systems', 'Network Centric Systems', 'Radar and Fire Control Systems', 'Tank Electronics and Gun Upgrade', 'Weapon System', and 'Outdoor Display Products'. In addition, BEL will also showcase its R&D capabilities by launching/demonstrating some of its new products and technologies. The company has set up an Experience Centre at its stall to showcase its Voice Analysis Software and Augmented Reality/Virtual Reality for Universal Simulator.

The highlight of BEL's outdoor display will be Weapon Locating Radar (mountain version), Akash Air Defence System, Ant-Radiation Decoy System, Surveillance Radar, Air Defence Fire Control Radar, Automatic Manpack SATCOM Terminal, Anti Drone System and Mobile Communication Terminal. The entire set of state-of-art equipment on offer will be a force multiplier for any Defence force and civilian requirements.

ON BEL'S FINANCIAL PERFORMANCE

CMD - BEL continues to be a profit-making PSU, despite challenges posed by the pandemic, global chip shortage and stiff competition. FY 2021-22 saw the company registering a record turnover of Rs. 15,044 Crores, a growth of 9% over the previous year. BEL became the first Defence PSU to cross the landmark market capitalisation figure of Rs.80,000 Crores, and declare the highest-ever dividend of 450%. The company has increased its authorised capital three-fold to Rs.750 Cr and issued bonus shares in the ratio 2:1.

This year, we are confident of continuing the good show and achieving revenue growth of 15 per cent and an EBIDTA Margin of 21%-23%.

On this occasion, I would like to share with you the good news that the Ghaziabad Unit of BEL has won the twin honour of CII EXIM Bank Business Excellence Award (2022) and the Jury's Commendation for Role Model Organisation. The Award is the highest level of recognition in the CII-EXIM Bank Award for Business Excellence, established by the Confederation of Indian Industry (CII) and Export Import Bank of India in 1994 to enhance the competitiveness of India Inc.

ON CUSTOMER AND EXPORT

CMD - BEL achieved recorded an Export turnover of 33.30 Million USD during FY 2021-22. Major products exported included Coastal Surveillance System, Trans-Receive (TR) Modules, EO-IR



Payload System, Compact Multi-Purpose Advanced Stabilization System (EOS CoPASS), Solar Hybrid Power Plant, Data Link, Electro-Mechanical parts, Low Band Receivers (LBREC), Medical Electronics, Spares for Radars, etc.

BEL is fast expanding its global presence, putting its best foot forward to give a thrust to exports worldwide. All-out efforts are being made to tap new markets across the globe, including the Indian Ocean Region (IOR) and friendly foreign countries (FFCs).

The Government is encouraging defence exports through many policy initiatives and has set a target of Rs.35,000 Crs by 2025. BEL has identified Exports & Offsets as one of its thrust areas and has drawn up plans to offer its select products and systems to various export markets.

Some of the other products and systems which are being promoted for exports include Homeland Security solutions, Smart City solutions, Border Protection Systems and Coastal Surveillance Systems. Having established a Coastal Surveillance System (CSS) for a few neighbouring countries, BEL is interacting with the Ministry of External Affairs to supply CSS to other friendly countries.

BEL is also focusing on Offset as a potential avenue for revenue generation. BEL is interacting with many foreign OEMs to meet Offset obligations in various programmes of the MoD. BEL has identified contract manufacturing (build-to-print and build-to-spec) for foreign OEMs and partnerships in the form of the Transfer of Technology of the latest systems and solutions as areas of emerging export opportunities. Efforts are also on to establish long-term supply chain relationships with global players.

ON CIVILIAN BUSINESS

CMD - Defence, being the mainstay of BEL, has traditionally been contributing to around 80% of the Company's annual sales revenue. BEL, however, has been continuously exploring opportunities in allied non-defence areas. The Company aims to increase its non-defence share in the overall business in the coming years.

Some of the areas BEL is focussing on in non-defence include solutions for the Civil Aviation sector including Air Traffic Controller Radars, Anti Drone systems, Space / Satellite Electronics, Satellite Assembly & Integration, Unmanned Systems, Solar Business, Railway and Metro solutions, Software as a Service, Network & Cyber Security, Energy Storage products for Electric Vehicles (Li-ion & Fuel Cells, Charging Stations, etc), Homeland Security & Smart City businesses, Smart Meters, a range of Medical Electronic and

BEL is focusing on enhancing interactions at various levels and building long-term relationships with customers, emerging Strategic Partners and other key stakeholders in the Indian Defence industry as a trusted and committed partner

AEROINDIA '23

health care solutions, Artificial Intelligence, Communication Radios & Networks, Composite Shelters & Masts, etc. This wide bouquet of businesses in non-defence would play a key role in driving BEL's growth in the coming years.

ON THE PARTNERSHIP WITH MSMEs

CMD - The Defence Sector is being opened up for private sector participation with the evolution of Defence Procurement Procedure. In this changing business scenario, BEL is focusing on enhancing interactions at various levels and building long-term relationships with customers, emerging Strategic Partners and other key stakeholders in the Indian Defence industry as a trusted and committed partner.

Be it the efforts that the Company has been putting in to engage in collaborative R&D in addition to augmenting its own R&D setup — its recent attempts to outsource work to Indian private industries and MSMEs, or the path-breaking decision to go in for Public-Private partnerships to execute turnkey projects, BEL is leaving no stone unturned to ensure that it is in sync with the Government's larger goal of indigenisation and self-reliance.

BEL has formulated a long-term Outsourcing and Vendor Development Policy and has been taking several initiatives in order to broaden the domestic vendor base by implementing online vendor registration and e-procurement processes including GeM. This is in line with the 'Make in India' initiative where enhanced thrust has

BEL has identified several areas for partnership with start-ups in new emerging areas including Machine Learning, Cyber Security, Artificial Intelligence, Embedded Computing and other latest technologies which can be used for Defence electronics applications

to be put to develop domestic players. Make in India Display Cells have been established at all Units of BEL. The procurement from MSMEs by BEL has been over 20% in the previous years. BEL also takes part in various events organised by the Government of India to promote MSMEs.

Startup India is a flagship initiative of the Government of India, intended to build a strong ecosystem that is conducive to the growth of startup businesses, drive sustainable economic growth and generate large-scale employment opportunities. BEL has identified



AEROINDIA'23

several areas for partnership with start-ups in new emerging areas including Machine Learning, Cyber Security, Artificial Intelligence, Embedded Computing and other latest technologies which can be used for Defence electronics applications.

BEL SHOWCASE AT AERO INDIA

The company will showcase state-of-the-art products and systems spanning every domain of its business.

The products and systems to be on display during Aero India 2023 have been clustered as 'Air Defence & Surveillance', 'C4I Systems', 'Artificial Intelligence-based Products', 'Non-Defence & Diversification Products', 'Radar Systems', 'Communication Systems', 'Airborne Products & Systems', 'Homeland Security and Cyber Security', 'Futuristic Technologies', 'Missile Systems', 'EO & Laser-based Products', and 'Outdoor Display Products'. In addition, BEL will also showcase its R&D capabilities by launching/demonstrating some of its new products/ technologies.

BEL's display in the area of 'Air Defence & Surveillance' will include Hexacopter, Tethered UAV, Swarm of UAVs, Robotic Surveillance, Shallow Water Remotely Operated Vehicle (ROV) and D4 Anti-drone Systems. The display in the area of 'C4I Systems' will include C4I technologies, Combat Management Systems and Navigational Consoles and that in the area of 'Artificial Intelligence-based Products' will include AI-based activity interference of air targets for situation awareness.

Also on show will be the complete range of products and systems for 'Non-Defence & Diversification', including High-Level Network Management in Advance Net-Centric Operation, Virtual Reality for Rolling Stock Driver Training System, Air Traffic Management System for Civilian Airports, Advanced Surface Movement Guidance Control System, Super SCADA for Delhi Metro Rail Corporation, Virtual Reality-based Training Simulator, X-ray Baggage Inspection System, Explosive Detector, Automatic Chemical Agent Detector and Alarm, Fuel Cell, Electric Vehicle Batteries for two-wheelers and three-wheelers.

BEL will showcase its 'Radar Systems' comprising a Combined Interrogator and Transponder System, Battle Field Short Range Active Electronically Scanned Array (BFSR-AESA) Radar, Frequency-modulated Continuous-wave based Drone Detection Radar, Air Defence Fire Control Radar, Close-in Weapon System, Mountain Fire Control Radar, Weapon Locating Radar, BFSR-XR, X-Band Multi-Function Radar, Battery Surveillance Radar, AESA Radar, and models of 3D Low-Level Light Weight Surveillance Radar and 4D Phased Array Medium Power Radar.

Some of the areas BEL is focussing on in non-defence include solutions for the Civil Aviation sector including Air Traffic Controller Radars, Anti Drone systems, Space / Satellite Electronics, Satellite Assembly & Integration, Unmanned Systems, Solar Business



Software Defined Radio manpack

BEL's display in the area of 'Communication Systems' will include Tactical Data Link, 0.76M Ku Band Manpack Terminal (manual assisted), Instant Fire Detection and Suppression System, Rugged Switches, Rugged Routers, Mine Field Recording System, Network Hardware Security Modules, Data Link Receiver Unit, High Capacity Radio Relay, Manpack High-Frequency Software Defined Radio (SDR), Point-to-Multi-Point Radio, DSSS Networking Radio, SDR Airborne version, SDR Hand Held Naval version, SDR Manpack Naval version, SDR Naval Combat, SDR Tactical, Encryptor, Multi Capacity Encryption Unit, Data Multiplexer-cum-Encryption Unit, Configurable Live Mk-II, BEL Tactical Computer Mk-VI, Hardware Security Module, Rugged Tablet, Network Time Server and Data Diode.

'Airborne Products & Systems' on display will include Ultra Violet Missile Approach Warning System, Self-Protection Suite for Helicopters, Hand Held Field Signal Generator, HD Airborne Spread Spectrum Modem, HD Ground Spread Spectrum Modem, Directed Infrared Counter Measure System, Tarang II Radar Warning Receiver and Display Unit Indigenous.

Other 'Futuristic Technologies' on display include Automatic Dependent Surveillance-Broadcast System, Position Indicator - G3I, Hand-Held Indian Regional Navigation Satellite System, Extended C-Band Block Up-Converter, Monolithic Microwave Integrated Circuit, C Band Phase Locked Oscillator, Router with Call Manager, Voice Gateway Unit, MIL-GRADE TAB, Signal Processing Unit for Flight Level Radar, UHF RFID Reader, 3 ATI Display, Torpbuster CPU Board and Smart Energy Meter.

The 'Homeland Security and Cyber Security' cluster will include display of Smart City solutions, Homeland Security solutions, Comprehensive Integrated Border Management System, Naval Airfield Integrated Security System, and Integrated Perimeter Surveillance System, while the 'Missile Systems' display will include Air Defence Weapon System.

'EO & Laser-based Products' will include Panoramic Night Vision Goggle, Twin Tube Goggle, Laser Dazzler, Corner Shot Weapon System, Multipurpose Reflex Weapon Sight, Mini Eye-safe LRF Module, FO Gyro-based Sensor Packaged Unit, Laser Fence System, Electronic Artillery Fuzes and Aerial Fuze.

The highlight of BEL's outdoor display will be GIMBAL for Tethered UAV, Tethered UAV, Shallow Water ROV, Hexacopter and Ultra-Light Weight Enclosure with platform. The entire set of state-of-art equipment on offer will be a force multiplier for any Defence force and civilian requirements. ■

PAKISTAN – FACING RESURGENCE OF TTP

While the deteriorating economic situation of Pakistan is worrisome for India, the resurgence of TTP in the northern regions, on the Afghan border, is pushing the troubled nation back to the dark days of jihad.

by **MAJ GEN AMRIT PAL SINGH (RETD)**

In what is most definitely a challenge to the sovereignty of the Pakistan government and the military, the Tehreek-e-Taliban Pakistan (TTP) – also known as the Pakistan Taliban based on its close alignment with the Afghan Taliban – on December 31, declared the formation of its government in northern Pakistan. The TTP has declared the formation of ministries and created two provinces which include Gilgit-Baltistan and areas bordering Afghanistan as one Northern Province and the other comprising all areas bordering Punjab including Dera Ghazi Khan Province of Punjab.

Based on reports, the month of December has been the deadliest month for Pakistan's security forces for over a decade with the TTP claiming 567 attacks in 2022. Khyber Pakhtunkhwa (KPK) province accounted for 58 per cent of all terrorist incidents in Pakistan. After the breakdown of the ceasefire with the TTP in November last year, a spate of attacks has been targeting the Pakistan Counter Terrorism Department (CTD). In December, a CTD compound in KPK's Bannu area was taken over and was only retaken after three days with the loss of four soldiers and many injured. The latest attack on January 4 has killed the Deputy Director and an inspector of the CTD and is a direct attack on Pakistan's intelligence agencies.

Pakistan's top leaders convened a meeting of the National Security Committee (NSC) in Islamabad to discuss the spike in violence. A statement issued after the NSC meet said "no country will be allowed to provide sanctuaries to terrorists" and their attacks "will be dealt with the full force of the state" – seen as an allusion to Afghanistan. An announcement by Pakistan defence minister

Khwaja Asif blamed the TTP for most attacks in KPK and held the Taliban government responsible for providing support to the TTP. This has evoked an admonishing statement from the Taliban government of Afghanistan as allegations and counter-allegations are traded.

Pakistan's Interior minister Rana Sanaullah has stated that Pak may target TTP hideouts and safe houses in Afghanistan if the Taliban fail to take action against them. In reply, there has been a rather mocking tweet by Taliban leader Ahmed Yasir warning

General Munir was earlier, in 2019, ousted as the chief spymaster of ISI (DG-ISI) after a tenure of just eight months. At that time, many opined that the Taliban deal to take over Afghanistan was the main agenda, and Prime minister Imran Khan placed his confidante General Faiz Hamid at the helm of the ISI

NEIGHBOURHOOD

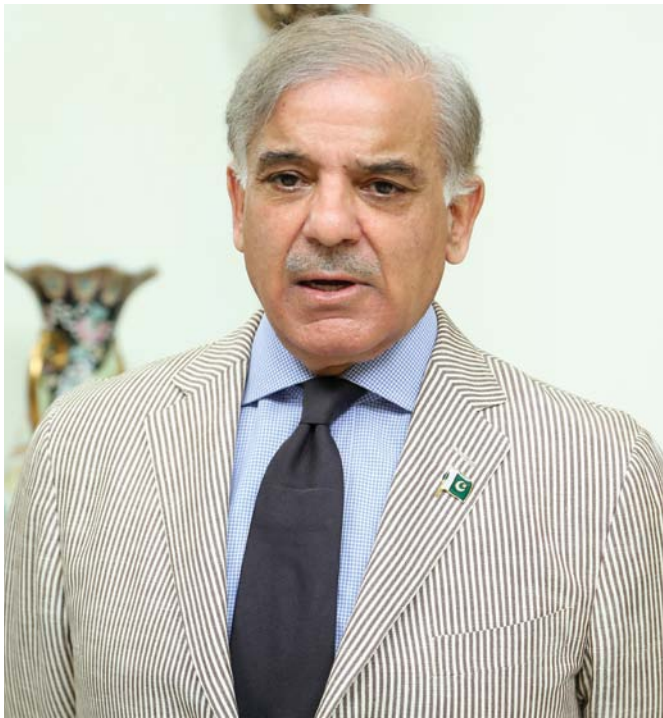
Pakistan of a repeat of the military defeat of 1971 at the hands of India if the Pak army dared a military attack within Afghanistan.

China has tacitly supported the Taliban Government and has argued against linking the human rights violations by the Taliban to travel bans. China has shielded terrorists based in Pakistan from actions such as asset freezes, travel bans and arms embargoes. In the international realm, it has been starkly evident that travel bans on Taliban ministers and officials are not effective as they freely travel abroad and the UN is not able to impose its ban.

Pakistan considers Afghanistan as a political extension and a strategic hedge against India by its providing strategic depth to Pak. The continued silence of the western world both individually and in the UN only emboldens terrorism emanating from the area and India is the prime target in the region. Another fact that allows the west to look the other way is that the direct victims of terror in the region are India and to an extent Pakistani civilians and assets.

The government and more so the military leadership (who call the shots) in Pakistan is under immense pressure due to the recent developments. Historically, whenever Pakistan has faced internal upheavals in the form of deteriorating law and order or terrorism there are attempts to create unrest in India, especially in Jammu Kashmir. The opening up of the tourism sector with an influx of 1,62,000 tourists to Kashmir and the valley is a red rag to the sponsors of terrorism and separatism. This translates to actions taking place both at the Line of Actual Control and the Line of Control (LoC). The areas bordering the LOC in Rajouri and Poonch have become active.

The Gwadar Rights Movement has meanwhile issued a warning to Chinese nationals to leave the Gwadar port area. About 5000 Chinese nationals are based in Gwadar port. Gwadar is a key asset for the Chinese Belt and Road Initiative (BRI). Chinese nationals



Shehbaz Sharif

China deployed elements of the Chinese PLA to protect Chinese engineers and workers in the Gilgit-Baltistan areas in North Pakistan

working on China-Pakistan Economic Corridor (CPEC) projects have been attacked regularly and reports suggest that China deployed elements of the Chinese PLA to protect Chinese engineers and workers in the Gilgit-Baltistan areas in North Pakistan. Such threats continue to escalate and threaten economic ties between China and Pakistan. The attempted intrusion in Tawang on December 9, by the Chinese PLA can be construed as an attempt by China to put India under pressure and such warnings need to be analysed to avoid and preempt any Galwan-like situation.

Indian security forces have been readjusting deployments to cater for the renewed threat assessments post the Chinese incursions in 2020. This readjustment is likely to have caused certain voids in areas less affected by terror incidents in the past. The January 1, attack on Hindu families in Dangri village, Rajouri district and the December attack near an army camp also in Rajouri are pointers to attempts to create panic and disrupt the initiatives of the state administration and security forces. There are bound to be such attempts to cause disruptions and discord within the government of the States, police forces and the army. These trigger internal discussions on the effectiveness and relevance of India's Kashmir policy which start getting questioned almost as a knee-jerk reaction.

In the report of the High-level Enquiry Committee on the 26/11 Mumbai attacks which looked into the response of the security forces, it was found that intelligence agencies and law and order agencies failed to heed the modus operandi of terror groups based in Pakistan in 2008. Analysis of open-source intelligence revealed that there was a pattern of attacking multiple targets simultaneously. Hotel attacks were a preferred form of terror strikes - Serena Hotel, Kabul (September 2008) and Marriot Hotel, Islamabad (September 2008) - were attacked before the Taj and Oberoi Hotel attacks in India. In the present situation, the TTP has resorted to drive-by attacks on intelligence operatives of the Pakistani establishment. It will be prudent for our intelligence community to take note of the lapses made by their counterparts and also put in safeguards.

The internal dynamics in Pakistan emanating from the recent developments are unpredictable, more so with the new command structure of the army under General Asim Munir ostensibly attempting to shake off the 'Bajwa Legacy'. General Munir was earlier, in 2019, ousted as the chief spymaster of ISI (DG-ISI) after a tenure of just eight months. At that time, many opined that the Taliban deal to take over Afghanistan was the main agenda, and Prime minister Imran Khan placed his confidante General Faiz Hamid at the helm of the ISI. The Taliban eventually took control of Afghanistan in August 2021 and General Hamid was seen as a main factor in brokering agreements within the Taliban. Now with Hamid having been forced to resign as he was not nominated to be the new Pakistan Army Chief the Taliban could be asserting its indifference and discord with the new military dispensation and by extension also to the Pakistani Government.

Views expressed here are personal. ■

NAVANTIA SIGNS CONTRACT FOR SUPPORT SHIPS FOR UK

Creating 1,200 UK shipyard jobs, hundreds of graduate and apprentice opportunities and an expected 800 further jobs across the UK supply chain, the team comprising BMT, Harland & Wolff and Navantia UK, will deliver three Fleet Solid Support ships for the Royal Fleet Auxiliary (RFA).

Set to invest around £100 million into UK shipyards, including £77m of infrastructure at Harland & Wolff's Belfast shipyard, the agreement will see a further £21m invested in skills and technology transfer from Navantia UK. This will be the catalyst for Harland & Wolff to create one of the most advanced shipyards in the UK, which will be significant for future export and domestic shipbuilding as well as offshore opportunities.

With around 900 jobs alone to be created in Belfast, the contract is a welcome boost for Northern Ireland.

Defence Secretary Ben Wallace, who visited H&W Belfast after the contract was signed, said: "This contract is a significant boost to the UK's historic shipbuilding industry, balancing shipbuilding across the Union.

"Creating jobs and prosperity, Team Resolute is bringing shipbuilding back to Belfast, developing a modern, resilient and thriving shipbuilding industry that will support naval and commercial shipbuilding into the future."

The FSS fleet will be the first ships built by Harland & Wolff in Belfast since MV Anvil Point was launched in 2002.

Strengthening shipbuilding in England and Northern Ireland,

this contract will complement the existing Type 26 and Type 31 frigate programmes DE&S manages in Scotland.

Vice Admiral Paul Marshall, Director General Ships at DE&S, said: "Now the Fleet Solid Support ships contract with Team Resolute has been signed, it is time to push on with what is a very exciting programme. "DE&S looks forward to working with our industry partners to deliver what will be the essential, last big piece of the UK's Carrier Strike Group, which will serve for decades to come."

The majority of the blocks and modules for the ships will be constructed at Harland & Wolff's facilities in Belfast and Appledore, following the British-crafted design by Bath-based company BMT.

Build work will also take place at Navantia's shipyard in Cadiz in Spain, with the final assembly for all three 216m-long vessels to be completed in Belfast.

On behalf of Team Resolute, John Wood, Group CEO of Harland & Wolff, said:

"This is the last chance to capture the excellent shipbuilding skills that remain in Belfast and Appledore before they are lost, and pass them on to the next generation of UK shipbuilders.

"UK Government has seized this opportunity and, in doing so, ensured the long-term survival of our shipyards and significantly bolstered sovereign shipbuilding capability."

Production is due to start in 2025, with recapitalisation and yard improvements starting immediately. All three support ships are expected to be operational by 2032.





PM INAUGURATES HAL HELICOPTER PLANT

Prime Minister Narendra Modi, on January 6, dedicated HAL's New Helicopter Factory to the nation at a function at Gubbi (Tumakuru). Speaking on the occasion, he hailed HAL's efforts in strengthening 'Aatmanirbharta' in the defence sector by building India's largest helicopter factory. From drone manufacturing to building Tejas fighter, naval carrier and transport aircraft, India is now producing everything indigenously, he said. HAL manufactures Tejas for the Indian Defence Forces and is the centre of global attraction. The factory will produce hundreds of helicopters and generate business to the tune of rupees four lakh crores besides generating direct and indirect employment boosting the regional economy, he added. The PM said that after laying the foundation stone in 2016, it was a momentous occasion to see the factory operational today.

He unveiled a Light Utility Helicopter (LUH) produced by HAL.

The Prime Minister expressed delight that hundreds of arms and defence equipment are being manufactured in India which are being used by the Armed Forces. "From advanced assault rifles to tanks, aircraft carriers, helicopters, fighter jets, transport aircraft, India is manufacturing it all", the Prime Minister remarked. Throwing light on the aerospace sector, the Prime Minister pointed out that the investment made in this sector in the last 8-9 years is five times the investment made before 2014 plus 15 years prior. The Prime Minister underlined that Made in India arms are not just supplied to the armed forces but the defence exports have also grown manifold when compared to the years before 2014. He emphasised that hundreds of helicopters are going to be manufactured in this facility itself in the near future which will give rise to businesses worth Rs four lakh crore. "When such manufacturing units are set up, it does not just strengthen the Armed Forces but also creates employment and self-employment opportunities," Modi remarked as he underlined that small businesses near the helicopter manufacturing facility in Tumkuru will get empowered.

The Prime Minister emphasised that with the spirit of 'Nation First' success is assured. He talked about revamping and reforms in the working of the public sector enterprises as well as opening up opportunities for the private sector.

The Prime Minister referred to the recent propaganda to target the government in the name of HAL and said that falsehood, no

matter how big, frequent or high, is always defeated in the face of truth. "This factory and the rising strength of HAL has exposed the purveyors of falsehood. Reality is speaking for itself," he said and added that today the same HAL is making modern Tejas for the Armed forces and is a centre of global attraction and bolstering India's 'Aatmanirbharta' in the defence sector.

The Defence Minister Rajnath Singh congratulated HAL and said that the inauguration of the Tumakuru factory is a big milestone in India's journey towards 'Aatmanirbharta'. The Tumakuru factory will boost India's defence services. India has now embarked on a journey to become a global hub in manufacturing, especially in the field of defence.

The Tumakuru factory will become a one-stop solution for all helicopter requirements of the country. With the establishment of facilities like Heli-Runway, Flight Hangar, Final Assembly Hangar, Structure Assembly Hangar, Air Traffic Control (ATC) and various supporting service facilities, the factory is fully operational. This factory is being equipped with state-of-the-art Industry 4.0 standard tools and techniques for its operations.

The Light Utility Helicopter (LUH), initially being built in this factory is an indigenously designed and developed 3-ton class, single engine multipurpose utility helicopter with unique feature of high manoeuvrability. Initially, this factory will produce around 30 helicopters per year, and it can be enhanced to 60 and then 90 helicopters per year in a phased manner.

ABOUT HAL HELICOPTER FACTORY

The Greenfield Helicopter Factory, spread across 615 acres of land, is planned with a vision to become a one-stop solution for all helicopter requirements of the country. After initially producing LUHs, the factory will be augmented to produce other helicopters such as Light Combat Helicopters (LCHs) and Indian Multirole Helicopters (IMRHs). It will also be used for Maintenance, Repair and Overhaul of LCH, LUH, Civil Advanced Light Helicopter (ALH) and IMRH in the future. Potential exports of civil LUH will also be catered to from this factory.

The HAL plans to produce more than 1,000 helicopters in the range of 3-15 tonnes, with a total business of over Rs four lakh crores over a period of 20 years.

EXTENDED RANGE BRAHMOS TEST BY IAF



Indian Air Force, December 29, successfully fired the Extended Range Version of Brahmos Air Launched missile against a Ship Target from a SU-30MKI aircraft. The missile achieved the desired mission objectives in the Bay of Bengal region. With this, IAF has achieved a significant capability boost to carry out precision strikes from SU-30MKI aircraft against land/ sea targets over very long ranges. The extended range capability of the missile coupled with the high performance of the SU-30MKI aircraft gives the IAF a strategic reach and allows it to dominate the future battlefields. The dedicated and synergetic efforts of IAF, Indian Navy, DRDO, BAPL and HAL have been instrumental in achieving this feat.

PRATT&WHITNEY OPENS NEW INDIA ENGG CENTRE

PRATT & WHITNEY, A RAYTHEON Technologies business, on January 19, officially opened the doors to its new India Engineering Center (IEC) in Bengaluru.

The facility is co-located with Pratt & Whitney's India Capabilities Center (ICC), which opened in 2022 to provide integrated global supply chain support, and the recently inaugurated Collins Aerospace engineering and global operations centers. The IEC, which was designed to meet the LEED Platinum certification, further enhances Raytheon Technologies' combined presence in India of over 5,000 employees and facilitates collaboration across the company's businesses.

"The Indian aviation market is growing at a rapid pace and Bengaluru is a hub for that growth," said Geoff Hunt, senior vice president, Engineering, Pratt & Whitney. "The work conducted at the IEC - by some of India's best and brightest minds - will support cutting edge technology that will drive the future of flight."

More than 50 employees are now based in the state-of-the-art facility, with an additional 450 jobs to be filled over the next four years. Work performed at the IEC will encompass elements such as aero and mechanical and control systems for various products

in Pratt & Whitney's broad portfolio of large and small commercial engines. It will also extend across the entire product lifecycle from development to field support and sustainment.

"The IEC will fully integrate with our existing global engineering footprint across Canada, Puerto Rico and Poland to advance world-class technology such as the geared turbofan and other sustainable propulsion solutions," said Paul Weedon, vice president, Engine Development, Pratt & Whitney Canada Corp. "The IEC team will be key to improving commercial engine performance, extending time on wing, reducing airline operating costs, and decreasing fuel consumption."

The opening of the IEC further illustrates Raytheon Technologies' long history of investing in India.

"I am truly excited about the future of Pratt & Whitney in India, and the significant investments we are making towards building a stronger aerospace ecosystem in-country," said Ashmita Sethi, Managing Director of UTCIPL. "Beyond the \$40M+ in financial investment in both the IEC and co-located India Capability Center, we are collaborating with local universities and investing in emerging technology companies to further enhance India's homegrown capabilities."

With more than 1,500 engines and auxiliary power units in service, Pratt & Whitney has one of the largest footprints for any engine maker in India. Pratt & Whitney's GTF engines power more than 180 A320neos and A321neos and have delivered more than \$1 billion in savings to Indian airlines since entry-into-service. Other significant investments in-country include Pratt & Whitney's state-of-the-art India Customer Training Center in Hyderabad and its R&D collaboration with the Indian Institute of Science, Bengaluru.

India is important to the global growth and investment strategy of Raytheon Technologies, and the advanced infrastructure and talent pool will help drive the country's contributions as a global leader in aerospace and defense.



GRSE & ROLLS ROYCE SIGNS MOU

In a major step aimed towards bolstering the ‘Make in India’ initiative, Garden Reach Shipbuilders and Engineers (GRSE) Ltd signed a Memorandum of Understanding (MoU) with Rolls Royce Solutions of Germany for manufacture of high quality marine diesel engines. The MoU was signed on January 27, 2023 by Cmde. PR Hari, IN (Retd), CMD, GRSE and Shri GS Selwyn, MD, MTU India in the august presence of Vice Admiral Sandeep Naithani, AVSM, VSM, Chief of Materiel of the Indian Navy. Senior officials from Indian Navy and GRSE were present on the occasion. The MoU shall go forward among the highlights for the upcoming Aero India ‘23.

Under the agreement, GRSE and Rolls Royce Solutions will co-operate in the licence production and localization of the technologically advanced MTU S4000 governmental marine engines. These engines, with a power output of 746-4300 KW, are compact, reliable and easy to maintain. They are used for Fast Patrol Vessels, Interceptor Boats and Fast Attack Crafts built by GRSE and other shipyards around the country. So far, these engines are imported, bringing down the indigenous content of these classes of vessels built at Indian shipyards.

MTU is a solution brand of Power Systems, a fully-owned subsidiary of Rolls Royce plc. The manufacture of these engines in India would also provide a great opportunity to local industry, particularly MSMEs involved in the manufacture of components and spares. It has always been GRSE’s aim to help in the growth of such business enterprises as part of ‘Make in India’ and continuously strive towards building a strong eco system of small & medium enterprises involvement in the prestigious projects that it handles. The MoU deals with Transfer of Technology related to



engine assembly, painting, parts sourcing and after sales service for these engines that are to be assembled at GRSE’s Diesel Engine Plant in Ranchi.

On the occasion, Commodore P R Hari, IN (Retd) said, “This partnership between GRSE & Rolls Royce Solutions is a step towards indigenisation of Marine Engines. This alliance will create a robust eco system of self-reliance in the naval shipbuilding domain and is a fillip for AatmaNirbhar Bharat.”

FIRST ASW SWC (GRSE) ‘ARNALA’ LAUNCHED

‘Arnala’, the first of eight Anti Submarine Warfare Shallow Water Craft (ASW SWC) Project, being built by GRSE for the Indian Navy was launched on 20 Dec 22 at M/s L&T, Kattupalli, Chennai. She made her first contact with water of Bay of Bengal at 1040 hrs at the



Launch Ceremony graced by Smt Rasika Chaube, Financial Adviser (Defence Services), Ministry of Defence. In keeping with the Naval maritime tradition, Smt Rasika Chaube launched the ship to the chanting of invocation from Atharva Veda. The ship has been named Arnala to signify the strategic maritime importance accorded to the island of Arnala (located about 13 Km north of Vasai, Maharashtra) by the great Maratha warrior, Chhatrapati Shivaji Maharaj.

Contract for building eight ASW SWC ships was signed between MoD and Garden Reach Shipbuilders & Engineers (GRSE), Kolkata on 29 Apr 19. Arnala class of ships will replace the Abhay class ASW Ships of the Indian Navy and are designed to undertake anti-submarine operations in coastal waters and Low Intensity Maritime Operations (LIMO) including subsurface surveillance in littoral waters. The 77.6m ASW SWC ships have a displacement of 900 tons with a maximum speed of 25 knots and endurance of 1800 NM.

Despite challenges due to COVID-19 pandemic, GRSE has made substantial progress on the ships of this project. Launch of this ship reinforces our resolve towards completely indigenous shipbuilding as part of Prime Minister’s vision of ‘Aatmanirbhar Bharat’. The ASW SWC ships will have over 80% indigenous content, ensuring that large scale defence production is executed by Indian manufacturing units thereby generating employment and capability build up within the country.

PRODUCTION OF AK-203 BEGINS AT AMETHI PLANT

The wait for the locally-made AK-203 is over. The production of the gun has begun in the Korwa plant of the Indo-Russian Rifles Private Limited (IRRPL), a joint venture between Russia and India.

“Russia and India are linked by strong partnership relations. Military-technical cooperation between the two countries has resulted in the construction of the joint venture Indo-Russian Rifles Private Limited. With the launch of series production of Kalashnikov AK-203 assault rifles, high-quality, convenient and modern small arms will begin to enter service with India’s defense and law enforcement agencies. The model combines excellent ergonomics, adaptability to different shooters and high performance characteristics, it is one of the best assault rifles in the world,” said Sergey Chemezov, General Director of Rostec.

to 70 per cent. The rest of the rifles will be produced with complete localization.

The joint venture plans to ensure 100 per cent localization of the production of AK-203 rifles in India. In future, the company may also increase output and upgrade its production facilities to manufacture advanced rifles based on the Kalashnikov assault rifle platform.

“Korwa Ordnance Factory in Amethi, Uttar Pradesh, has produced the first batch of 7.62 mm Kalashnikov AK-203 assault rifles. The beginning of deliveries to the Indian Army is expected soon. At the same time, the factory’s capacity makes it possible to fully equip the personnel of other law enforcement agencies in India with AK-203 assault rifles, which, due to their high adaptability, are suitable for various operators. In addition, the joint venture will be able to export its products to third countries,” said Alexander Mikheev, Director General of Rosoboronexport.

Indo-Russian Rifles Private Limited fully complies with the Government of India’s Made in India initiative and DAP 2020. Today, India is the first country to start producing the AK-200-series assault rifles of the world-famous brand.

The AK-200-series assault rifles have retained all the advantages of the traditional AK scheme: reliability, durability and ease of maintenance. At the same time, they fully meet the latest requirements for firearms in the world in terms of ergonomics and the ability to mount high-tech additional equipment.

Russia and India continue to implement military-technical cooperation projects. Their current and future programs are maximally focused on technological cooperation, including on the basis of joint ventures, in the format of licensed production and joint R&D projects. Rosoboronexport aims to cooperate on terms of transfer of technology put forward by the Indian side and in accordance with the Make in India initiative.

Coming from the home of the legendary AK-47, AK-203 is an improved version of the AK series, which fires 7.62x39 mm bullets and allows all modern additions, including a variety of sight systems, to target designators and under-barrel grenades. Despite evolving into a modern firearm, the gun has retained all the advantages of the traditional AK classics: reliability, durability and ease of maintenance.

Compared to earlier Kalashnikov rifles, AK203 has better ergonomics, accuracy and density of fire. Robust mechanics and simplicity of operation are other strong points. The gun has been tested under the conditions of extreme heat and cold.

The obvious technical advantages of AK203 for India are in its high degree of versatility, adjustability and customizability. The Picatinny rail enables swift instalments of additional equipment depending on the nature of the mission: night and day gunsights, flashlights, handles, laser designators etc. The rifle can be quickly adapted to the use of various components of the Armed Forces and security agencies.



Rostec is the parent company of Rosoboronexport and Kalashnikov Concern, the Russian partners of the IRRPL where Munition India and Advanced Weapons and Equipment India Limited represent India. As per the joint venture agreement, signed in 2019, now defunct Ordnance Factor Board (OFB) owned 50.5 percent of shares of IRRPL and Kalashnikov Concern owned 42 and rest by RoE.

In December 21, during the visit of Russian President Vladimir Putin, India-Russia signed a contract for 6,00,000 rifles. As per the agreement, the first 70,000 AK-203 rifles will be produced in India with a phased increase in the extent of localization from 5 per cent



URALVAGONZAVOD COMPLETES DELIVERY OF T-90M TANKS

URALVAGONZAVOD OF THE ROSTEC State Corporation has successfully completed another contract for the supply of T-90M Proryv (Breakthrough) tanks. A batch of armored vehicles has already been sent to the Russian Ministry of Defense.

“The employees of the Nizhny Tagil plant are the best specialists in the field of tank building. Today, their mastery is confirmed by one of the most modern tanks in the world - the T-90M Proryv tanks. They have a new turret, a new generation of dynamic protection, a new

gun, modern means of communication, a more powerful engine, and much more. They are equipped with modern equipment that allows the tank crew to effectively hit targets. UVZ completed the task set under the state defense order on time,” said Deputy Prime Minister of the Russian Federation, Minister of Industry and Trade of the Russian Federation Denis Manturov.

T-90M (export modification - T-90MS) is a new battle tank, created on the basis of experience in the production, operation and combat use of T-90 family tanks with the use of latest technologies and technical solutions. The key advantages of the T-90MS, as noted by Russian experts in armored vehicles, are a good balance between firepower, security and mobility; a wide range of modern types of ammunition used; highly efficient fire control system; multi-level protection against all currently existing anti-tank weapons.

The export version of the T-90M MBT is the T-90MS. According to the Russian export catalogue the T-90MS MBT is equipped with modern automatic fire control systems, cutting-edge protection, robust and powerful engine, and reliable transmission.

The 125mm cannon allows it to engage targets at long distances with high accuracy, and keeps the MBT from the enemy anti-tank assets effective area. The fire control system provides sustained target search, detection, identification and tracking under any weather conditions, day and night, from a halt position or on the move.

The T-90MS MBT offers comprehensive protection against conventional ammunition, precision guided weapons (guided artillery projectiles, ATGMs) and anti-tank rockets. ■



IS SELF-RELIANCE ON THE RIGHT PATH?

by ROHIT SRIVASTAVA

INDIA'S EXPORT TO ARMENIA of 155mm artillery guns, Pinaka multi-barrel rocket system and Swathi weapons locating radars is being looked at as the arrival of India as a weapon exporting nation. One cannot deny the fact that the Defence Research and Development Organisation (DRDO) has developed a variety of weapons that can substantially increase the effectiveness of any medium-rung military power. Indian private sector is also making weapons systems like artillery guns wherein Bharat Forge has a serious capability.

A cursory look at the weapons being developed by the Indian companies looks assuring. It appears that India is on its way to self-reliance in defence. But is it true? Not really.

In the last five years, two nations have taken on major powers of the world with their homegrown weapons. They have not only achieved the military objectives of the conflict in which they participated but also made a serious geopolitical impact. These two nations are Iran and Turkey. Today these two countries are established drone superpowers. Their drones are in demand from troubled regions of Africa to the war zones of Ukraine.

The success of Iran is more astonishing than Turkey. Iran is under western economic and industrial sanctions. Unlike Iran, Turkey, a NATO member, has access to western money and technology. Despite these limitations, Iran developed a large variety of drones and produced them in large enough numbers to equip Russia for the Ukraine conflict. This is no mean feat.

The success of the Turkish TB2 armed drone in the Libyan civil war and Armenia-Azerbaijan war is now part of military history. The sudden rise of Turkish drones surprised the world. When the rest of the world was conceptualising armed drones, Baykar Makina, an auto part maker, developed Bayraktar TB2 which is operationally

so effective that it changed the way wars are going to be fought. It brought an end to the age of US drones like Predators operating in uncontested air space. TB2 is designed to operate in defended airspace. And it did what it was designed for. Learning lessons from Libya and Armenia where Russian air defence systems were at receiving end, Russia in the ongoing conflict neutralise the TB2 effectively. There is a lesson for India to learn.

Similarly, Iranian drones like Sammad-2, Sammad-3, Ababil-T and Shahed-136 have done wonders against Saudi Arabia, Israel and Ukraine, respectively. They are economical and effective. The best thing about them they are easy enough to be operated by rag-tag militia. In the hands of well-trained soldiers, they are as effective as any cutting-edge weapon system. Ask Ukraine.



WHY INDIA IS NOT IN THIS LEAGUE?

The answer is both simple and complex. As it is said, in India everything is equally true. So, also in this case. First the complex one, Indian defence requirements are primarily decided by armed forces and they always aspire for the best. Nothing wrong but many a time the demand is not in sync with national

technological capability. There is a lack of flexibility in accepting lower specifications. As part of the same system, there should always be flexibility to accept what is possible. This is true for all development programmes, not only for drones.

Second the simple one, Indian armed forces never gave the drones the desired attention, until Armenia lost the war. Iran and Turkey learned the right lessons from the War on Terror and learned the limitation of UAVs like Predators and the challenges in developing something similar. They found that simple, cheaper drones can be more effective. They also worked out tactical and operational planning centred on them.

India is missing this simple approach. ■

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The background of the entire page is a photograph showing the silhouette of a large Unmanned Aerial Vehicle (UAV) on a runway. The sun is low on the horizon, creating a bright orange and yellow glow. Several people are silhouetted around the aircraft, some standing and one kneeling near the front. The overall mood is dramatic and industrial.

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UAV WARFARE

REPORT

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