STRENGTHEN INDO-JAPANESE BOND : A VIEWPOINT PACE 6











Vol: 4 Issue 1 🛛 January 1-15 • 2014

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SPOTLICHT

Defence Ministry gives nod for Israeli Barak missile and other deals

The Defence Ministry has cleared the longpending naval procurement of an additional 262 Israeli Barak-I missiles at an estimated cost of ₹880 crore. The deal was mired in controversy and now it goes before the Cabinet Committee on Security.

The Indian Navy has been demanding replenishment of stock of missiles to arm the Israeli Barak-I antimissile defence (AMD) systems fitted on 14 frontline warships like aircraft carrier INS Viraat and the latest Shivalik-class stealth frigates. But with CBI failing to find evidence of kickbacks in the original ₹1,160 crore Barak-I deal inked by the National Democratic Alliance (NDA) regime in October 2000, the Defence Acquisition Council (DAC) has now cleared the fresh case after consulting the Law Ministry and Attorney General.



The DAC also gave the green signal for the delayed naval project for 16 anti-submarine warfare (ASW) warships for ₹13,440 crore and two diving support vessels meant for rescuing sailors from disabled submarines for ₹1,500 crore. It also approved the ₹300-crore purchase of 41 Dhruv advanced helicopters, manufactured by the Hindustan Aeronautics Limited (HAL).

The proposal for two deep submergence rescue vessels like "mini submarines" — which 'mate' with disabled submarines underwater to rescue trapped sailors from depths up to 610 metres — for instance has been stuck for over 15 years.

Of the several projects currently underway— Israel Aerospace Industries (IAI) and the Defence Research and Development Organisation (DRDO) are jointly developing a long-range surface-to-air missile system for ₹2,606 crore to arm Indian warships and a medium-range SAM system for IAF at a cost of ₹10,076 crore. 52



Cover:

On January 1, 2014, Arup Raha, a veteran fighter pilot, assumed charge as the 24th chief of the Indian Air Force, succeeding Air Chief Marshal N.A.K. Browne.

Cover images: PIB, DRDO, SP Guide Pubns

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Web Developer: Ugrashen Vishwakarma

Annual Inland: ₹1,320 • Foreign: US\$ 325

subscribe@spsmai.com

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From the **EDITOR'S DESK**





irst and foremost, a very Happy and Prosperous New Year! For us at SP Guide Publications, 2014 is momentous as we move into our Golden Jubilee celebrations. As we pay tribute to our founder Shri Sukhdeo Prasad Baranwal, we reiterate our commitment to the readers that it will be our constant endeavour to enhance the product offering. SP's *M.A.I.* is the youngest of the publications from the SP Guide Publications group and the niche magazine on military, aerospace and internal security will continue to address needs of securing the nation.

2013 has been an eventful year for the nation. There have been many highs and several lows. On the internal security front, there were terror strikes in Hyderabad, Bengaluru, Bodh Gaya and Patna in which several people and police personnel were killed. The dastardly Naxal attack in Chhattisgarh claimed the lives of 27 people, including former Union Minister,

V.C. Shukla. Then there have been constant border incursions on both the western and eastern fronts.

Two natural disasters of enormous proportions hit the country one in Uttarakhand and the other on the eastern coast. While these raised issues of India's preparedness to handle natural disasters, it showed the capabilities of the military in rescue and relief operations.

This has been highlighted in the interview of the new Chief of the Air Staff, Air Chief Marshal, Arup Raha who has pinpointed how the Indian Air Force did a record 3,702 sorties to evacuate nearly 25,000 people from the flood-hit areas of Uttarakhand, highly commendable efforts. While that is on the humanitarian front, the Air Chief has dwelt at length on how the vision of the IAF in evolving itself as a multi-spectrum strategic force capable of addressing the current and future challenges. One of the major challenges, he mentions, is for India to remain a contemporary aerospace power which possesses credible response options.

The armed forces are a force to reckon with in the region. Lt General (Retd) P.C. Katoch in his article 'Afghanistan Calling' has indicated how India can help Afghanistan in its efforts to rebuild

SP Guide Publications completes 50 years



Our Founder Shri Sukhdeo Prasad Baranwal

the country. Militarily Afghanistan has sought tanks, mortars, artillery and aircraft besides military vehicles like troop carrying trucks, jeeps, a training facility in Afghanistan for its military and assistance in maintenance of military equipment. Naturally, India would obviously provide maximum possible assistance under the India-Afghanistan strategic partnership, of which security is an important facet. Similarly, in his fortnightly viewpoint the General has underscored the need for India and Japan to strengthen relationship on various fronts.

As we look ahead, there is a glimmer of hope that the general elections would bring a new government to steer the country to a stronger position in terms of securing the nation, in terms of economic growth and a positive investment climate. Importantly, we should see probity in governance and the first signs are already being witnessed in New Delhi.

Once again, wishing you all a wonderful year ahead! We look forward to your continued association.



Publisher & Editor-in-Chief





MINISTER OF DEFENCE INDIA

am happy to learn that SP Guide Publications is completing 50 years of existence.

Since its inception in 1964, SP Guide Publications has played an unmatched and a vital role by serving our Armed Forces and their concerns.

The publications' efforts have been appreciated by all its readers. I hope that SP Guide Publications will continue to serve our Armed Forces and the nation in the years to come.

I wish SP Guide Publications the very best in its endeavours.

Jai Hind.

(A.K. Antony)



SP's EXCLUSIVES By SP's Special Correspondent



India signs deal for six more C-130Js

he Indian Government has finally signed on the dotted line for six more Lockheed Martin C-130J Super Hercules special mission transport aircraft. The six planes, which will begin delivery in 36 months, will be based at Panagarh in West Bengal.

As earlier reported by *SP*'s *M.A.I.*, it has taken the government over two years to process the follow-on order, which has been in the pipeline since the first deal was signed. For former IAF Chief N.A.K. Browne, the deal going through just days before he retired is fortuitous, given that it was under his stewardship that deliveries of the aircraft commenced. In the past, Brown has revealed that the six new aircraft will come with minor modifications, though it is not clear at this time what these are. Overall configuration of the aircraft will be identical to the first six, deployed with 77 Squadron Veiled Vipers at the Hindon Air Force Station. The foreign military sales (FMS) deal, worth just under \$1.1 billion, will give the IAF a fleet of 12 aircraft, though Lockheed Martin has internally assessed an IAF requirement of at least 30 aircraft. The company is said to be working on making another offer for more aircraft to supplement the units in the current and future squadron.



Tejas team on top gear for full capability clearance



Whith the successful completion of initial operational clearance (IOC), that officially sees the LCA Tejas released for service with the IAF, Team Tejas Mk.1 is now gunning for another, far more important milestone line—final operational clearance (FOC), a demonstration of all of the platform's stated capabilities across the mission spectrum. The team now effectively has 12 months to achieve and demonstrate a slew of capabilities and performance parameters set down in air staff requirements for the Mk.1.

As it stands, work has already begun on the FOC test points, including crucial elements like the in-flight refuelling capability and integration of a Russian 23mm cannon. For starters, the team will be looking to expand the Tejas Mk.1's flight envelope in terms of G performance and angle of attack. The stipulated performance requirement is for -3.5G to 8G and 24° angle of attack. This will require an incremental flight test schedule, but without the luxury of time. The test team will also be required to integrate and demonstrate firing of the Israeli Derby and Python air-to-air missiles.

While the Derby is a BVR missile, the Python is the second close combat heatseeking missile the Tejas will be capable of deploying, following the proven Vympel R-73. Next will come the GSh-23 cannon and fresh drop tanks to aid aerodynamic performance in the supersonic flight. As reported earlier by *SP's*, the Tejas will also be given a new radome to ramp up electrodynamic performance. Work on FOC test points have already begun in earnest, and will be spread across three test locations in the country over the next 12 months.

Astra carriage trials successfully in progress

While the Tejas team gets set to test the Derby BVRAAM as part of the FOC regime, a team in Pune is ticking off performance points on the indigenous Astra indigenous BVRAAM. The missile, integrated with a modified Su-30MKI, is currently undergoing carriage trials, the final phase of trials before a first ever testfiring from an airborne platform next year.

As reported earlier by *SP's*, captive flight test for the Astra missile on the Su-30MKI aircraft was planned in three phases:



Phase-1, to carry out aero-structural and mechanical integrity for carriage of Astra under steady and manoeuvring conditions, Phase-2 to carry out validation of weapon control system and its electrical and avionic interfaces with Astra missile and in Phase-3, to check the performance of missile system in transmitting and receiving mode of missile seeker with designated target under different flight conditions. While the Astra Mk.1 will have an intercept range of 44 km, it will be the Astra Mk.2 that will be a true force multiplier weapon, with an intercept range in excess of 100 km-work has already begun on expanding the performance of the baseline missile version. The Astra will ultimately be tested on the Tejas Mk.1 before it becomes the standard fit weapon on the Tejas Mk.2. SP

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MILITARY Viewpoint



LT GENERAL (RETD) P.C. KATOCH

Strengthen Indo-Japanese bond

midst all the muscle flexing by China against both India and Japan, the recent visit to India by Japan's first ever reigning Emperor Akihito and Empress Michiko had special significance, given the history of Indo-Japanese friendship, the 2,600 years old Japanese monarchy and the fact that their decision to visit India was due to pressing request from Japanese Prime Minister Shinzo Abe with over 50 other countries awaiting visit of the royal couple.

Their last visit to India was in 1960 as the young crown prince and princess. The recent visit sent a clear message about the strategic partnership that Japan has with India. However, coverage for the royal couple ironically in our media was somewhat subdued despite

Japanese media describing the visit as 'non-political' and not aimed at countering China. This was perhaps because of the latent fear of annoying the dragon; the euphuism that continues to haunt us. India played the Indio-South Korea friendship in subdued fashion similarly for many years in deference to ties with North Korea. Visit of the royal couple was all the more significant considering the reverence they are accorded by the Japanese public.

The Japanese Prime Minister himself is expected to be the chief guest at India's Republic Day parade 2014. Strategic bonds between India and Japan need to be strengthened on continuous basis; increasing bilateral ties and cooperation in trade, defence, nuclear and space segments. The focus on security needs to be enhanced considering China's aggressive posture that is increasingly threatening peace in the Indo-Pacific region. The accent should therefore be on maritime cooperation and sharing of technologies in the domains of cyberspace and the electromagnetic. Being an economic superpower for decades, Japan can also assist India in the latter's economic transformation. Japan has undertaken several development projects in India.

The Union Minister for Road Transport and Highway Oscar Fernandez had recently stated that the royal visit followed by the visit of the Japanese Prime Minister will give a boost to the much vaunted tunnel roadway through Shirdhi Ghat connecting the coastal city of Mangalore with Bengaluru. In 2012-13, India-Japan bilateral trade touched \$18.6 billion. As of March 2013, cumulative commitment of official development assistance (ODA) was Yen 3,807 billion. Comprehensive economic partnership agreement (CEPA) is in force since August 2011 and covers such areas as trade in goods and services, investments, intellectual property rights, customs procedure.

Recently, it was decided to expand the bilateral currency swap arrangement to \$50 billion, talks on introducing high speed railway system in India, progressing Delhi-Mumbai Freight Corridor, Delhi-Mumbai Industrial Corridor, Chennai-Bengaluru Industrial Corridor, introducing high speed railway system in India, plus cooperation even in maritime



security and counter terrorism. Early resumption of negotiations for civil nuclear cooperation and hope for an early conclusion agreement is on the cards. With congruence on most global issues, India and Japan have a shared interest in dealing with the challenges posed by an increasingly assertive China. China engineered the declaration of the Air Defence Identification Zone (ADIZ) challenging Japan's sovereignty over Senkaku Islands

just prior to the royal visit to India.

Though China's apparent aim is to test the US-Japan alliance and snake forwarded along her arbitrarily extended exclusive economic zone in the East China Sea and the South China Sea, she has inadvertently woken up Japanese nationalism that is not going to take the Chinese challenge submissively, US support notwithstanding. With increasing say of the People's Liberation Army in the Chinese Communist Party, including military Generals in the powerful politburo, Chinese aggressiveness will likely increase with rise of her comprehensive national power. Already China has said that more ADIZs may be announced by her. Present India-Japan bilateral relationship needs to be carried much beyond as the two countries work for global partnership with converging strategic interests.

The views expressed herein are the personal views of the author.

Present India-Japan bilateral relationship needs to be carried much beyond as the two countries work for global partnership with converging strategic interests



MILITARY Updates



Agni-III launch, a flawless mission

The Strategic Forces C o m mand (SFC), fired the long range Agni-III missile with a range capability of over 3,000 km from Wheeler Island, off the Odisha coast recently.

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The trajectory of the trial was tracked by a battery of

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sophisticated radars, telemetry observation stations, electro-optic instruments and naval ships from its launch till the missile hit the target area with pinpoint accuracy. Agni-III missile is equipped with advanced high accuracy navigation system and guided by an innovative guidance scheme.

SFC spokesman said after the launch,

PROTECTING OUR HEROES

"Such successful training launches clearly indicate our operational readiness to meet any eventuality as also establishes the reliability of this deterrent component of India's strategic arsenal".

Navantia and Turkish shipyard partnership for construction of Juan Carlos I

he Government of Turkey has announced that the partnership formed by Navantia and SEDEF, the Turkish shipyard, has been selected for the design and construction of one LHD and four LCM landing crafts for the Turkish Navy.

Navantia will provide the design, transfer of technology, equipments and technical assistance to SEDEF for local construction. Besides the design, based on the LHD Juan Carlos I for the Spanish Navy, Navantia will also provide several components and systems, as the engines, the turbine and the IPMS (integrated platform management system).

Navantia's design has been selected due to the fact that it is a built and proven design



in the case of LHD Juan Carlos I, and a very advanced construction in the case of LHD Canberra and LHD Adelaide for the Royal Australian Navy.

With this Navantia is entering the Turkish market, where it will present the F-100 frigates, as well as the consolidation of Navantia as a reference in the LHD market.



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Harris Corporation receives order from Australia for Falcon tactical radios

arris Corporation, an international communications and information technology company, has received a \$100-million follow-on order to provide multiband handheld and high-frequency manpack tactical radios to the Australian Department of Defence.

Harris will deliver the radios in the latest phase of the joint project 2072 modernisation programme. The Australian military forces are fielding and deploying additional Falcon III AN/ PRC-152 handheld radios and vehicular adapters as well as Falcon II AN/PRC-150(C) high-frequency manpack radios.

"This order extends the longstanding relationship between Harris and the Commonwealth of Australia and demonstrates their continued trust in our tactical communications solutions," said Brendan O'Connell, President, International Business, Harris RF Communications.



The Falcon III AN/PRC-152 is the first joint tactical radio system (JTRS) software communications architecture-certified multiband, multimode handheld radio. The radio provides line-of-sight and beyond-line-of-sight communications capabilities.

The Falcon II AN/PRC-150(C) highfrequency manpack is the only military Type-1 HF radio available today, setting the standard for secure, reliable, longrange beyond-line-of-sight communications on the battlefield.

Harris is providing long-term support for the Australian military forces through its Asia-Pacific headquarters in Newstead, Brisbane and the Harris Communications Logistics Centre in Pinkeba, Queensland. The logistics centre provides service.

Sweden buys more allterrain vehicles from BAE Systems

BAE Systems has signed a \$120 million (SEK 800 million) contract to supply an additional 102 BvS10 all-terrain vehicles to Sweden. The new sale is the result of an extended contract option taken out when the Swedish Defence Materiel Administration (FMV) announced a purchase of 48 BvS10 armoured vehicles from BAE Systems Hägglunds in January 2012.

The vehicles will be delivered in different variants — troop carrier, command vehicle, ambulance, and logistic carrier. They will be manufactured in BAE Systems Hägglunds´ refurbished production facility in Örnsköldsvik, Sweden with deliveries beginning in 2014 and ending in 2015.

The Swedish go-anywhere BvS10s feature enhanced crew ergonomics, internal volume and increased protection, plus integration of the Protector remote weapon station, radio, and battlefield management systems. Smoke grenade launchers are also fitted to give 360 degree coverage.

Sweden, the United Kingdom, the Netherlands, and France all operate the BvS10 and more than 10,000 of the earlier,



smaller BV206 family of vehicles have been sold around the world. BAE Systems Hägglunds' all-terrain vehicle family is also gaining interest for use in humanitarian aid and disaster relief around the globe.

JHSV 3 completes builder's trials



The future USNS Millinocket (JHSV 3), recently completed builder's sea trials at the Austal USA shipyard in Mobile, Alabama. Successful completion of builder's trials marks the end of the first phase of a set of rigorous trials during which all of the ship's systems and capabilities are evaluated to ensure they are in accordance with its plans and specifications.

During the trials, Austal conducted comprehensive tests to the ship's major systems including the combat, propulsion, ballasting, communications, navigations and mission systems.

"Millinocket performed well," said Strategic and Theater Sealift Programme Manager Captain Henry Stevens. "Over the last few days, we conducted hundreds of tests to evaluate the ship's systems, handling and capabilities all of which bring us one step closer to acceptance trials and delivery."

Millinocket is the third ship of the HSV class. This versatile, non-combatant, transport ship will be used for the fast intratheatre transportation of troops, military vehicles and equipment.

JHSV is designed to commercial standards, with limited modifications for military use. The vessel is capable of transporting 600 short tonnes 1,200 nautical miles at an average speed of 35 knots, and can operate in shallow-draft ports and waterways, interfacing with roll-on/roll-off discharge facilities, and on/off-loading a combat-loaded Abrams main battle tank (M1A2). Other joint requirements include an aviation flight deck to support day and night aircraft launch and recovery operations. The JHSV class will have airline style seating for 312 embarked forces, with fixed berthing for 104.



MILITARY Viewpoint



Afghanistan calling



[By Lt General (Retd) P.C. Katoch]

awaz Sharif 's one-day visit to Afghanistan on November 30, 2013, preceded by Pakistan's erstwhile army chief Kiyani to carve for Pakistan the major role in post-2014 Afghanistan and somehow keeping India out of cut little ice with President Hamid Karzai, latter quite clear about the double game that Pakistan has been playing over the years. Later, Prime Minister Manmohan Singh and President Hamid Karzai discussed the US-Afghanistan Bilateral Security Arrangement (BSA) when they met in New Delhi in December 2013.

It was Pakistan that gave the sweet pill of 'good' and 'bad' Taliban to the US knowing full well that Taliban's sole aim is establishment of an Islamic Caliphate since they despise Afghanistan's Constitution. As per intelligence reports, Pakistan is presently engaged in training scores of Mujahid battalions as irregulars and mating them with her proxies in order to gobble up as much Afghan territory as possible to expand her radical nurseries. Robert Kaplan in his book *The Revenge of Geography* described this as the strategic depth that Pakistan desires; creating a succession of radicalised Islamic societies from the Indo-Pak border to Central Asia, giving the Inter-Services Intelligence (ISI) the ability to create a clandestine empire composed of the likes of Haqqanis, Taliban and the Lashkar-e-Toiba (LeT). This is the dilemma of stability that the region faces in the aftermath of withdrawal of US forces from Afghanistan in immediately after the presidential elections.

Afghanistan has asked India for military assistance in terms of tanks, mortars, artillery and aircraft besides military vehicles like troop carrying trucks, jeeps, a training facility in Afghanistan for its military and assistance in maintenance of military equipment. About 100 officers of Afghan National Army (ANA) will be trained for four weeks at the Counter Insurgency and Jungle Warfare School (CIJWS) located at Vairangte in Mizoram. Naturally, India would obviously provide maximum possible assistance under the India-Afghanistan strategic partnership, of which security is an important facet.

President Karzai has welcomed the Indo-Russia plan for setting up a joint repair and maintenance facility in Afghanistan. The North Atlantic Treaty Organisation (NATO) is also reportedly in talks with Russia for establishing Russian repair facilities in Afghanistan that NATO had purchased from Russia and gifted to Afghanistan. Since Afghanistan has asked India to also establish base repair facilities in Afghanistan, it would be prudent to optimize the India-Russia defence partnership to jointly cater for repair and maintenance of most military equipment that Afghanistan would have in 2014 and beyond. Maintenance and repair of military equipment is a major problem in Afghanistan.

MILITARY Viewpoint

As per a report released in January 2013 by the Centre for Strategic and International Studies (USA), the US direct spending for war in Afghanistan from 2002 to 2013 totalled \$641.7 billion (bulk after 2009), of which \$198.2 billion (over 30 per cent) was spent in fiscal years 2012 and 2013. Though vast majority of aid went to Afghan National Security Forces (ANSF), little was done to establish repair and maintenance facilities. Already Afghanistan holds military equipment with origins in some 30 countries. To add to this would be equipment that the US forces are likely to give to Afghan security forces before withdrawing, one example being UAVs. Therefore, it would be prudent for the US to leave behind technical staff for repair and maintenance of the US origin equipment under the BSA till requisite capacity is



built within Afghan forces. This would be in the interest of US, NATO and Russia since none of them want Taliban influence expanding in Afghanistan, and beyond to Central Asia, Russia and Europe.

What also need attention is measures that can make the ANA a regular force, which it presently is not. Presently, all soldiers on three year contractual basis. Future insecurity in minds of soldiers lends to desertions, desertion rates reportedly being quite high. John Glaser writing in AntiWar.com on December 18, 2012, reported around 50,000 Afghan soldiers (26 per cent of ANA) quitting each year, and some eight per cent of Afghan National Police (ANP) too quitting annually. Afghanistan is perhaps unable to establish a regular army because of bulk economy being dependent on foreign aid.

The Tokyo Mutual Accountability Framework was adopted at the

Tokyo Conference on Afghanistan in Japan on July 8, 2012. Among the international community's provisions in the framework, it committed to provide over \$16 billion through 2015, and sustaining support, through 2017, at or near levels of the past decade to respond to the fiscal gap as estimated by the World Bank and the Afghan Government. Then in March 2013, NATO decision on supporting the retention of the 3,50,000-strong ANSF up to 2018 implied that \$3.6 billion in annual assistance pledged at the Chicago Summit would now be raised to \$5.6 billion, at least until 2018. What Afghanistan needs from the world is continued financial support for converting the ANSF to a regular force, till the time Afghanistan's own economy can come up to sustain these forces indigenously. That would be a significant contribution for the security and stability of the region.

Next, it is the Afghan economy itself that needs to be addressed. During the decade plus of US presence in Afghanistan, little has been done to alleviate the Afghan economy. Ironically, the world too has made little progress on decisions

What Afghanistan needs from the world is continued financial support for converting the ANSF to a regular force, till the time Afghanistan's own economy can come up to sustain these forces indigenously. That would be a significant contribution for the security and stability of the region

taken during Istanbul Conference on Afghanistan (November 2011) including major ones like: cohesive strategy to develop and maintain a regionally connecting infrastructure, with support from international partners; encouraging Afghanistan's role as a land-bridge, connecting the region through cooperation and completion of bridges on transboundary rivers, roads and railway networks, and; cooperation on easier flow of energy resources within, from and across the region, especially with regard to electricity, minerals, oil and gas, including their exploitation and transit, through regional projects, such as TAPI, and CASA-1000 project which has to be implemented with a broader financial contribution. as well as the World Bank, the Asian Development Bank and the Islamic Development Bank.

Similarly, little progress on international commitment to CBMs agreed during the Kabul Ministerial Meeting (June 2012) has been made. Afghanistan is home to some \$3 trillion worth untapped mineral deposits. If this is exploited in a secure and safe environment, then after five years revenues expected from is minimum \$1.2 billion annually and after 15 years, \$3.5 billion per year. Then there are some 3.8 billion barrels of oil between Balkh and Jazwan alone while Afghanistan only consumes 5,000 bbl per day. Estimated mean volumes of undiscovered petroleum were 1,596 million barrels (Mbbl) of crude oil, 444 billion cubic metres of natural gas, and 562 Mbbl of natural gas liquids.

In December 2011, Afghanistan signed an oil exploration contract with China National Petroleum Corporation (CNPC) for development of three oilfields along the Amu Darya. CNPC began Afghan

oil production in October 2012, extracting 1.5 million barrels of oil annually. With oil hovering around \$100 a barrel, an output of 2,50,000 bpd would earn Afghanistan about \$9.1 billion a year. That would be roughly half the country's gross domestic product of \$20 billion in 2011, according to the World Bank. Therefore, Afghanistan needs global assistance to bring up its own economy given the vast natural resources it is blessed with.

Finally, in addition to military assistance to fight Pakistan-sponsored Al Qaeda, Taliban and LeT, Afghanistan also needs a secure environment to exploit its natural resources, especially since no foreign venture is permitted to bring its own security forces along. What Afghanistan therefore also needs is a strong Central Industrial Security Force (CISF) that can protect all the civil ventures including mineral, petroleum and gas exploration, as also provide protection to repair and maintenance facilities that are to be established. India should assist Afghanistan in establishing such a CISF that has the capacity to ward off all terrorist attacks.



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AEROSPACE Interview



First & Exclusive

The Indian Air Force (IAF) with 1.75 lakh personnel and contemporary equipment is a formidable force. It is evolving into an aerospace force that would operate state-of-theart platforms and systems to deal with multispectrum threats to India's national security. Giving insight into this capability is the Chief of Air Staff, Air Chief Marshal Arup Raha. Here are excerpts of the interview:

IAF evolving as an aerospace force: Air Chief Marshal Arup Raha

SP's M.A.I. (SP's): What has been the most memorable event during your tenure as the Air Officer Commanding-in-Chief of Western Air Command as also during your tenure as the Vice Chief of Air Staff (VCAS)?

Air Chief Marshal Arup Raha (CAS): Every tenure in my career has been eventful, memorable, enriching and very satisfying. My tenure as the VCAS has been short but represents an accelerated learning curve in working with the Army, Navy, the Ministry of Defence (MoD), defence public sector undertakings (DPSUs) and other agencies. It is not possible for me to identify any particular event as outstanding while tenanting VCAS appointment.

However, the most memorable event during my tenure as the Air Officer Commanding-in-Chief (AOC-in-C) of Western Air Command (WAC) was the execution of humanitarian assistance and disaster relief operations 'Operation Rahat' in Uttarakhand in June 2013. The unprecedented disaster of enormous magnitude had called for launching of perhaps the largest ever helicopter relief operations involving 45 helicopters. Various innovative steps including the fuel bridging missions undertaken by C-130 special operations aircraft and Mi-26 heavy-lift helicopter contributed to the success of the operations. A record 3,702 sorties were flown in airlifting

24,260 people to safety. This event will always be remembered by the IAF and the nation as one of the most outstanding disaster relief operations in the history of our country.

SP's: Considering that the spectrum of war has been enlarged and requires capability and expertise for simultaneous conflict of different types, how has this affected the inventory of the IAF, its organisation and focus on training?

CAS: The all-spectrum capability development process of the IAF to enhance our combat potential has been factored in the long-term integrated perspective plan (LTIPP). Along with the acquisition of more versatile combat platforms, force multipliers and creating net-centric environment, the IAF is aware of the need to enhance the skills required of our air warriors to be able to absorb the state-of-the-art technologies. Hence, even on the training front, we have revised our training syllabi to be commensurate with our future needs. These include induction of new aircraft for training, like the Pilatus PC-7 MkII and Hawk along with greater emphasis on ground-based training systems (GBTS) like simulators, mission debrief equipment, synthetic training devices and computer-aided learning systems.



AEROSPACE Interview



SP's: What is the vision of the Indian Air Force vis-à-vis the emerging regional power status of the nation? What steps need to be taken in broad terms to enable the IAF to match the aspirations of the nation?

CAS: Considering our geopolitical, economic and energy needs, it is essential that we have the capability to safeguard India's national interest. The IAF's vision envisages a multi-spectrum strategic force capable of addressing the current and future challenges. The application of aerospace power would prove to be the decisive factor in any future contingency. Hence, one of our major challenges is to remain a contemporary aerospace power which possesses credible response options.

SP's: Air power is the most predominant tool in war-fighting and it is also becoming the 'weapon of first choice'. Is the IAF receiving adequate funding to meet its requirements for building the requisite capability?

CAS: The future threats are likely to be diverse, varied and complex with the spectrum of conflict likely to range from asymmetric to high intensity conflicts. The IAF needs to be prepared at all times to be able to successfully meet the challenges and be in a position to exert influence in our area of interest. These aspirations will have to be prioritised and juxtaposed with the overarching impact of budgetary constraints in the light of several competing demands. The government has assured us that the requirement for additional funds shall be reviewed based on the progress of new and ongoing schemes.

SP's: What are your views on the establishment of Space Command?

CAS: Establishing a Space Command has been a long-pending need of the armed forces. The essentials of such a Command had been studied and the proposal is being processed for approval. The Space Command has been envisaged to have a tri-services character with IAF as the lead service.

SP's: Strategic reach of a nation is also determined by the capacity to sustain operations far away from its borders. This requires capability for logistic support and cooperation of friendly countries by way of firm bases. Has this aspect been factored in at the strategic levels of planning by the IAF?

CAS: The IAF has an exemplary record of providing succour to friendly foreign countries in emergency conditions such as tsunami, cyclone or earthquake. Participation of the IAF in international exercises across continents such as Red Flag (USA), Garuda (France) and Indradhanush (UK) are demonstrations of the IAF's strategic reach.

SP's: Joint and integrated operations have been weak areas in the Indian armed forces. Has the joint doctrine adequately addressed this issue?

CAS: Jointmanship has been an essential component of operational philosophy of the armed forces. The Joint Doctrine issued by Headquarters Integrated Defence Service (HQ IDS) in 2006 formally addresses all issues pertaining to conduct of joint operations by the three services.

SP's: Each service has professed its interest in acquiring networkcentric warfare (NCW) capabilities for the future. NCW mandates networked organisations, command and control and new warfighting methodologies apart from attitudinal changes. What is being done in this field at the tri-service level?

CAS: The IAF recently demonstrated its network-centric capabilities in Exercise Iron Fist and Exercise Livewire in 2013. The integration of sensors into the Integrated Air Command and Control System (IACCS) and Air Force Net (AFNET) is an ongoing project and the IAF endeavours to seamlessly integrate maximum number of sensors in this network. The IAF has taken a lead in undertaking the requisite inte-

gration with Army and Navy networks at appropriate levels with the IAF network for sharing of relevant data.

SP's: India will soon be one of the largest economies in the world. How do you see the new role and responsibility of the IAF in this context in the future?

CAS: The IAF is ever ready to undertake any role assigned to us by the government to safeguard our national interest as well as that of the friendly foreign nations. Modernisation of Air Field Infrastructure (MAFI) along with flexi-use of air space would enable economy of expenditure by reduction in fuel consumption and carbon footprint. In the future, the IAF would evolve to be an aerospace force that would operate state-of-the-art platforms and systems, in a real-time, fully-networked environment and would be fully equipped to deal with multi-spectrum threats to India's national security.

SP's: The nation continues to be dependent on foreign sources even for basic equipment. What steps are needed to strengthen indigenous capability?

CAS: The Defence Procurement Procedure 2013 lays emphasis on providing the desired boost to the Indian defence industry by mandating a higher preference to the 'Buy (Indian),' 'Buy and Make (Indian)' and 'Make' categorisation in capital procurement. The industry needs to come forward and invest in quality infrastructure to capitalise and strengthen their production base and become centres of excellence. The DPSUs as well as the private industry, would be in a position to ensure that more and more cases are categorised as 'Buy (Indian).'

SP's: Development of the armed forces in India has been somewhat Pakistan-centric. How do you see the equation with China in the event of a military confrontation in the future?

CAS: Our capability build up is not specific to any country, but is based on an analysis of the overall capability requirements to face challenges arising in our area of interest. The IAF analyses its threat perception at regular intervals and accordingly updates its plans factoring in all the envisaged contingencies. The government has sanctioned a force level of 42 combat squadrons for the IAF. Even with the 34 combat squadrons currently, the IAF has adequate operational potential to meet any emergent situation impinging on India's national security.

SP's: In what time frame can the nation hope to see the Dassault Rafale streaking across the Indian skies?

CAS: The MMRCA is a complex weapon system procurement case. The wide ranges of requirements of this project are being extensively negotiated with the vendor by the Contract Negotiations Committee (CNC). The CNC has to ensure that all aspects of manufacturing 108 Rafale aircraft in India between Dassault Aviation and numerous Indian production agencies including the Hindustan Aeronautics Limited are captured in the contract. The contract would be signed with due approval by the Cabinet Committee on Security after being processed at the Ministry of Defence and Ministry of Finance. The first of the Rafale aircraft would be inducted a few years after the signing of the contract.

The interview was conducted in mid-December when Arup Raha was the Vice Chief of Air Staff and designate-Chief of Air Staff. For full interview, please look out for SP's Military Yearbook 2014 (42nd Edition)

AEROSPACE Report



An improved Tejas gets initial operational clearance

[By R.Chandrakanth]

n a significant milestone in India's aerospace realm, the light combat aircraft (LCA) Tejas, today received the initial operational clearance (IOC II), bringing it closer to the aircraft's induction into the Indian Air Force (IAF). The Defence Minister, A.K. Antony handed over the 'Release to Service Certificate' of the indigenous supersonic combat aircraft to the Chief of Air Staff, Air Chief Marshal, N.A.K. Browne, at the Hindustan Aeronautics Limited (HAL) airport in Bengaluru.

Marked by severe delays, the LCA's journey is a story of determined efforts of the Indian aerospace community to make a fighter aircraft of international standards.

Speaking on the occasion, the Defence Minister said during the last three years, the capabilities of the aircraft have been improved significantly. "In recognition of the enhanced capabilities, IAF has decided to grant the aircraft a higher status, namely, the initial operational clearance for induction into the service."

Antony confessed that he had his share of anxieties regarding the future of LCA when in 2006 he took charge as the Defence Minister and said, "Today we are putting behind the moments of selfdoubt, frustrations and setbacks which we as a nation have gone through in the last 30 years."

"The improvements to the aircraft have enhanced the flight envelope of the aircraft and also weapon delivery capability of the aircraft. The performance at Iron Fist, Jaisalmer and the recent missile firing at Goa are examples of such improvements. The reliability of the aircraft and serviceability has also been enhanced. The number of flights nearing 500 within this year provides an indication of this. Operating at IAF bases namely, Jamnagar, Jaisalmer, Uttarlai, Gwalior, Goa, Leh, Pathankot demonstrate the aircraft capability to operate from Air Force bases. There have also been occasions when the same aircraft has flown thrice on the same day, indicating the operational reliability of this home-bred fighter aircraft," he said.

Military aviation has got a major boost with the approval of several new programmes, including MkII variants of Navy and Air Force; advanced medium combat aircraft; unmanned air systems; fifth-generation fighter aircraft (FGFA) and medium transport aircraft (MTA), to name a few. Antony called upon both the public and private sector to work in tandem to develop and produce worldclass military systems of the highest quality.

The Chief of Air Staff, Air Chief Marshal Browne, in his address said

AEROSPACE Report



"Having come a long way since the finalisation of Air Staff Requirements (ASR) in 1985, Tejas has completed an arduous journey through a complex and challenging design and development process and has achieved the required certification standards for airworthiness, manoeuvrability and air-to-air as well as air-to-ground weaponisation. It is indeed a proud day for the nation and particularly for the IAF; since the grant of IOC acknowledges the capabilities of this aircraft and paves the way for induction of LCA Mk I into operational service."

The creation of a modern and capable military capability for our nation's defence hinges entirely on the foundation of a robust indigenous industrial base. This is particularly true for the military aviation sector since it involves high-end research and specialised production facilities. Design of a modern fighter aircraft encompasses an array of niche technologies that are very expensive and invariably subject to stringent technology denial regimes. Therefore, the success achieved in this important national project is highly significant since it demonstrates India's scientific prowess and puts our nation firmly on the path of achieving self-reliance in the critical aerospace sector."

The design and development process for LCA Tejas has added tremendous learning value for our scientific fraternity as well as HAL and has created a vast repository of knowledge during the design refinement and realignment over these years. These must not be lost as we move onto other programmes. Through the initial phases, the Technology Demonstrator as well as the Limited Series Production (LSP) aircraft proved the fundamental strength of this platform while incorporating multiple enhancements for retaining LCA's efficacy in the fast paced and technology driven operational environment. Today, the LCA project has seen successful integration of a state-ofthe-art avionics suite in a well defined glass cockpit configuration. The aircraft uses significant composite structures and incorporates robust control laws for the digital fly-by-wire system. Successful integration of various types of air-to-air and air-to-ground weapons have added the much needed firepower to this fighter. All of these core technologies and design features have made Tejas a truly modern fighter aircraft inspite of being the smallest and lightest in its class."

The Air Chief said, "While the nation celebrates grant of IOC to Tejas, we cannot rest on these laurels since our work is well 'cut-out' for the days ahead. With the series production of 20 IOC aircraft being an immediate goal, ADA with its associated design partners and HAL have to con-

tinue steering the project steadily towards achievement of full operational clearance (FOC) standards by December 2014, as directed by Hon'ble Raksha Mantri. It is also imperative that we establish a robust spare support supply chain for maintaining the fleet in the coming years. With the integration of new BVR missiles, integral guns and air to air refuelling capability, LCA will acquire increased potency and enhanced operational efficiency as envisaged at the FOC level."

As the programme gathers pace, we must remember that the final goal for all of us is not just the LCA MkI, but the LCA MkII. While our air warriors are fully geared up to induct and operationalise the two Mark I squadrons, IAF keenly looks forward to induction of four squadrons of LCA MkII as the final version in its projected force structure. This calls for a focused and coherent approach by all stakeholders with determined efforts to overcome all existing weak areas in design and management. The two primary design drivers already identified by us are the critical GE 414 engine integration for enhanced thrust along with perhaps a better intake design and improved maintainability of the platform. With better HMI functionality and a more efficient avionic system architecture, these design improvements promise to add to LCA's operational capabilities, as envisioned in the ASR. Under pinning these design improvements is the immediate need to adopt efficient management structures. Although we have the most qualified and capable designers and engineers as part of our team, reluctance to change impedes our ability to make mid course corrections and steer the project away from obvious pitfalls. The way ahead calls for close monitoring and monthly reviews at the highest levels. I therefore, urge all agencies to be ready to 'bite the bullet' and never hesitate in making tough decisions as they work towards the final induction of LCA MkII into IAF."

The historic event was attended among others by the Scientific Advisor to Defence Minister Avinash Chander; the Secretary of Defence Production G.C. Pati; Chairman of HAL R.K. Tyagi; Programme Director of ADA P.S. Subramanyam, and Director General (Aero) and Chief Executive, CEMILAC Dr K. Tamil Mani.

Tejas is a contemporary aircraft: ADA Programme Director

he light combat aircraft Tejas, as of today, meets the requirements of the Indian Air Force," the LCA Programme Director of Aeronautical Development Agency (ADA), P.S.Subramanyam told *SP's M.A.I.* in a brief interaction, on the eve of the aircraft getting initial operational clearance, in Bengaluru.

Asked whether any of the suggestions put forth by IAF had remained unfulfilled, Subramanyam drew an analogy by stating "It is like building a house. After you move into it, you will still be making constant improvements." However, he reiterated that it is one of the most contemporary aircraft.

On the major changes the aircraft, has gone through in its long journey, from concept to now, he said "The fuselage is totally made out of composites and the electronics is top-end and contemporary." With an open system architecture, he said, it was possible to accommodate changes quickly. Composites helped reduce weight too and the aircraft is the lightest with a gross weight of about 9 tonnes.

"The innovation in the cockpit has been truly significant. It is highly pilot-friendly cockpit with inputs coming from pilots. It is not just pilot-friendly, but also maintenance-friendly as the needs of the engineers and technicians who deal with the aircraft for longer hours than a pilot, have been taken care of."

The symbology in the cockpit, he mentions, is something unique which the pilots find it easy to grasp. "We have created the cockpit in such a way that the pilots have been saying, 'It is my cockpit." Significant improvements in cockpit ergonomic and lighting system have been accomplished for night flying.

To a question on what was the most difficult part in Tejas, he said designing and developing "the high angle of attack" and that the team developed its own methodology. This has considerably enhanced the combat performance of the aircraft. With flight control systems, the aircraft maintains an angle and in Tejas the team has designed till 24 degrees, while the aircraft in tests has performed upto 22 degrees. "We expect it to be at 26 degrees for the full operational clearance (FOC)." The maximum degrees in a fighter aircraft is said to be 28 degrees and the aircraft is likely to get there.

The aircraft is being produced at HAL and delivery is expected to commence from 2014. After the achievement of IOC II, HAL will go ahead with the series production of Tejas. HAL has already established the structural assembly hangar and the assembly jigs as per international standards.

The first 20 aircraft will be in FOC configuration, he affirmed.

Arup Raha assumes charge as IAF Chief

n January 1, 2014, Arup Raha, a veteran fighter pilot, assumed charge as the 24th chief of the Indian Air Force, succeeding Air Chief Marshal N.A.K. Browne. Fifty-nineyear-old Raha took charge from Browne in the presence of senior officers, including the new Vice Chief of Air Staff Air Marshal R.K. Sharma and Deputy Chief Air Marshal S. Sukumar.

Born on December 26, 1954, he will remain the IAF chief for three years. He was commissioned on December 14, 1974, in the fighter stream. In his illustrious career spanning 39 years, Raha has held various command, staff and instructional appointments. He has also served as Air Attaché at the Embassy of India in Ukraine. Besides various technical courses, Raha has done Strategic Nuclear Orientation Course and Junior Commanders' course.

He has commanded the Central Air Command and the Western Air Command, besides serving as the Directing Staff at Flying Instructors School, Tambaram (Tamil Nadu) as well as at the Gwalior-based Tactics and Combat Development Establishment of the IAF.

On assuming charge, Air Chief Marshal Raha, said the IAF is on a trajectory of modernisation and is transforming into a strategic aerospace power with full spectrum capability.

"In this strategic transformation process, I expect sustained efforts and special attention from all air warriors to maintain high operational status of the legacy equipment, while operationalising the new inductions in a time-bound manner," he said.

The Air Chief said the force will continue to support the maintenance of security forces deployed for counter-insurgency operations. "Sustained efforts in air maintenance in the northern and eastern sectors are being appreciated by the military, paramilitary, central agencies and state authorities."

He said, "Accretion through new acquisitions, replacement of obsolete equipment with state-of-the-art inductions and upgrade of the vintage weapon platforms would bolster our capabilities.



Chief of the Air Staff, Air Chief Marshal Arup Raha after assuming charge from his predecessor Air Chief Marshal N.A.K. Browne on December 31, 2013

In-depth knowledge, proficiency and professional competence to harness the potential of new equipment would provide the necessary cutting-edge in discharging our onerous tasks."

The IAF Chief commended the air warriors for their exceptional dedication and commitment during Operation Rahat in flood-hit Uttarakhand rescuing thousands of people and saving precious lives. "A record 3,702 sorties were flown while 24,260 people were airlifted to safety, despite the challenges imposed by inclement weather, difficult terrain, high altitude and unprepared helipads."

The people of the force were its "most valuable assets. A strong, motivated and cohesive team is the key to our success. I exhort all air warriors to follow the fine traditions of this great service and ensure that we 'Touch the Sky with Glory.'"

Lockheed Martin delivers 300th C-130J Super Hercules

The C-130J Super Hercules programme reached another significant milestone with the delivery of its 300th aircraft, which was ferried recently by a US Air Force crew from the Lockheed Martin facility in Marietta.

The 300th Super Herc is an MC-130J Commando II assigned to the US Air Force Special Operations Command. The Commando II supports such missions as in-flight refueling, infiltration/exfiltration, and aerial delivery and resupply of special operations forces.

"The delivery of this 300th C-130J is a major achievement for the entire Super Hercules community. Together, we built an aircraft that it is ready for any mission, anywhere, anytime," said George Shultz, Vice President and General Manager of the Lockheed Martin



Aeronautics Company's C-130 programmes. "Partnerships and commitment are at the core of this Super Hercules, as was the case with the 299 C-130Js that came before it and with the many others that will follow."

Sixteen countries have chosen the C-130J Super Hercules to meet their air mobility needs. The "J" is the standard by which all other airlift is measured in terms of availability, flexibility and reliability.

With more than one million flight hours,

the C-130J has been deployed in two combat theaters where they operated at a very high tempo efficiently and reliably. In noncombat — but equally harsh — environments, C-130Js are often the first to support missions like search and rescue, aerial firefighting, and delivering relief supplies after earthquakes, hurricanes, typhoons and tsunamis around the world.

USAF receives 16th Super Galaxy

ockheed Martin recently delivered its 16th C-5M Super Galaxy to the US Air Force from its facilities here. The US Air Force aircrews ferried aircraft tail number 87-0036 to Dover Air Force Base, Delaware. It is the fourth C-5M delivery in 32 days and the sixth for 2013.

The C-5M Super Galaxy has set 43 world aviation records and has been a game changer for strategic airlift. 52



AEROSPACE Developments

Brazil announces winner of fighter acquisition programme



he Brazilian Defence Minister Celso Amorim recently announced the winner of the international competition for the acquisition of new multi-mission fighters for the Brazilian Air Force (FAB).

Accompanied by Air Force commander Brigadier Juniti Saito, Amorim said the Federal Government had decided in favor of the Gripen-NG aircraft offered by a consortium led by Swedish manufacturer Saab.

The French Rafale (Dassault) and the North American F-18 (Boeing) also competed in the final stage of the competition. According to Celso Amorim, the victory of the Swedish fighter in the F-X2 programme is mainly due to technical reasons. "The choice was the object of much study and careful consideration, and took into account performance, effective technology transfer and acquisition costs as well as operating costs. The final choice was based on these three factors," said the minister.

Also weighed in the selection, according to Brigadier Juniti Saito, criteria concerning the commercial counterparts (offsets) offered by Saab, in accordance with the provisions of the National Defense Strategy

(SND). "We have several industries that have offered to contribute to the development of the aircraft. At the end of development, we will have access to all the technology of the aircraft," said the commander of the FAB.

In the Brazilian Air Force's evaluation, the Gripen-NG was distinguished by cutting edge technology with advanced system of sensors and data fusion, characteristics that give the pilot a complete and accurate picture of the combat scenario. The new multimission aircraft was designed for air superiority, air defense, aerial reconnaissance, air-to-ground and anti-ship engagements.

According to the FAB, the acquisition of the Swedish fighter will allow Brazil to face threats anywhere in the country, with a full load of weapons and fuel.

The winning bid covers the supply of 36 aircraft. The investments are in the order of \$ 4.5 billion, in a disbursement schedule will last until 2023. The first aircraft is expected to arrive around 48 months after the signature of the financing agreement, which must occur in December 2014. SP

Airbus Military reveals details of C295 firefighter programme

irbus Military has completed a second round of tests of its prototype C295 firefighting aircraft which will provide detailed data on the performance of its water dropping system.

Following earlier testing of the system, the company conducted seven water drops at a special range near Cordoba, Spain using ground equipment designed to measure the dispersal pattern of the water.

The trials were successfully completed and showed good initial promise, confirming



the aircraft's highly satisfactory handling during the drop procedure. In the coming weeks the data will be examined in detail to enable decisions to be taken on the final configuration of the C295 firefighter.

In the trials the aircraft carried one 3.500 litre tank and the water was gravity-ejected through two dispensers in the belly.

The planned configuration would offer double that capacity with two 3,500 litre tanks being deployed using a roll-on/rolloff system which would permit the aircraft to be used for transport purposes when not required for firefighting duties - greatly increasing its cost-effectiveness.

Jeronimo Amador, Airbus Military HO Market Development, Light & Medium aircraft said: "We are pleased with the progress of the testing we have performed so far and very encouraged by the results. We will now analyse the data in greater detail and intensify our contacts with potential customers interested in the C295 as a firefighter. A roll-on, roll-off solution based on this highly flexible aircraft has excellent potential to address the financial challenges faced by authorities responsible for aerial firefighting worldwide."

Use of HTT-40 Trainer by IAF

he Hindustan Aeronautics Limited (HAL) has sanctioned an amount of ₹176.93 crore for preliminary design phase and detailed design phase activities of Hindustan Turbo Trainer-40 (HTT-40) aircraft.

The Indian Air Force (IAF) has expressed reservations over acquiring the HTT-40 developed by HAL and has recast its proposal from 'Make' category to 'Buy and Make' category to procure the balance 106 basic trainer aircraft (BTA).

The Base Repair Depots (BRDs) are primarily repair and overhaul agencies. Presently, IAF BRDs have the requisite capability, expertise and infrastructure to integrate, repair and overhaul various types of aircraft, according to the Minister of State for Defence, Jitendra Singh. 💵



Covernment clears proposal for buying 15 Heron UAVs

Lange the Indian Government has cleared the procurement of 15 unmanned aerial vehicles (UAVs) from Israel at a cost of around ₹1,200-crore. A proposal to procure these Heron UAVs was approved by the Cabinet Committee on Security headed by Prime Minister Manmohan Singh at a recent meeting.

The ₹1,200-crore proposal for procuring the UAVs will bolster the Israeli-origin Heron and Searcher fleet of the force which deploys them on both the eastern and western sectors. The force has a fleet of more than 40 such vehicles, which are expected to undergo upgrades in the near future.

The Indian Air Force (IAF) flies the Israeli-made Searcher II and Heron UAVs for reconnaissance and surveillance purposes and about 100 Searchers are in operation on Indian borders in western, northern and eastern regions. After the upgrades, the air force would be capable of operating these aircraft from faroff distances and control them through satellite communication system.

The Indian Army also operates a sizeable number of UAVs and has deployed them in borders along the western and eastern fronts. The army was the first to induct UAVs in the 1990s starting with Searcher Mark I and Searcher Mark II which could operate at



an altitude of 15,000 feet and finally the Heron, which can operate at 30,000 feet.

Army's Northern Command had recently issued a global tender for procuring latest miniature unmanned aerial vehicles for gathering intelligence and carrying out reconnaissance of areas along the Line of Control (LoC) with Pakistan and Sino-India border.

The Indian Navy has also three operational squadrons of the Israeli UAVs deployed along both the eastern and the western sea boards.

Successful trials for Selex system on Schiebel Camcopter S-100



Schiebel and Selex ES have successfully integrated and flown the SAGE electronic warfare system on an unmanned air system for the first time. On December 12, 2013, the system flew onboard a Schiebel Camcopter S-100 UAS.

SAGE is a digital electronic support measure (ESM) and electronic intelligence (ELINT) system for radio frequency (RF) intelligence, surveillance and reconnaissance (ISR) missions. It enhances situational awareness by passively collecting emitter data from RF sources at a tactically significant range, comparing them with an emitter library and then identifying and geo-locating any threats. Pete Forrest, Vice President, Sales for Electronic Warfare at Selex ES, said, "Armed forces are facing the two-headed challenge of needing to be able to detect increasingly RF threats while having to operate under tighter budgets. With SAGE, customers have a sophisticated RF detection and geo-location system available that they can operate costeffectively on platforms such as the Camcopter S-100. We are pleased to be working so effectively with Schiebel and look forward to demonstrations around the world in 2014."

Hans Georg Schiebel, Chairman of the Schiebel Group of companies, said: "The SAGE integrated simply and quickly into the S-100, proving the flexibility of both the UAS and the ESM and ELINT. SAGE forms a core component of Schiebel's integrated suite of sensors that will provide decision-makers with an unprecedented step change in tactical ISR collection capability."

Schiebel's Camcopter S-100 unmanned air system (UAS) is a proven capability for military and civilian applications. The vertical take-off and landing (VTOL) UAS needs no prepared area or supporting launch or recovery equipment. It operates in day and night, under adverse weather conditions, with a beyond line-of-sight capability out to 200 km, both on land and at sea.

The S-100 navigates via preprogrammed GPS waypoints or is operated with a pilot control unit. Missions are planned and controlled via a simple point-and-click graphical user interface. High definition payload

imagery is transmitted to the control station in real time. Using fly-by-wire technology controlled by a triple-redundant flight computer, the UAV can complete its mission automatically.

Its carbon fiber and titanium fuselage provides capacity for a wide range of payload/endurance combinations up to a service ceiling of 18,000 feet. In its standard configuration, the Camcopter S-100 carries a 75 lbs/34 kg payload up to 10 hours and is powered with AVGas or heavy fuel.

More Sperwer UAVs for French Army

he French defence procurement agency, DGA, has awarded Sagem a follow-on order for five Sperwer SDSTI unmanned aerial vehicles, which will be operated by the French Army's 61st Artillery Regiment. The order follows an order for two launchers awarded in October last.

The aircraft will be manufactured in Montluçon using components produced by other Sagem facilities at Dijon (sensor turret), Poitiers (optical components) and Fougères (electronics). This latest order will maintain the French army's tactical drone capabilities through 2017.

It is rumoured that the French army may deploy a Sperwer detachment to the Central African Republic to support troops deployed there as part of France's Operation Sangaris.



INTERNAL SECURITY News

Home Ministry 2013 review

During the year 2013, the Ministry of Home Affairs (MHA) dealt with the challenges of security, law and order, disaster management, police modernisation and border management among other issues. Important consultation meetings with the Chief Ministers, DGPs of States/UTs on law and order and naxalities management were also held. The Criminal Law (Amendment) Act, 2013, launch of Crime and Criminal Tracking Network & Systems (CCTNS), Strengthening of Unlawful Activities (Prevention) Act, 1967 were other highlights during the year.

Strengthening of Unlawful Activities (Prevention) Act, 1967

The Unlawful Activities (Prevention) Amendment Act, 2012 as passed by the Parliament has come into force from February 1, 2013. The Act enlarges the ambit of the "Terrorist Act" by incorporating threats/dangers to the economic security of the country and the monetary stability of India by way of production, smuggling or circulation of high quality counterfeit Indian paper currency. The law increases the period of declaration of an association as unlawful from two years to five years, criminalises high quality counterfeiting and includes within its scope offences by companies, societies or trusts and provides for punishment to them.

The Criminal Law (Amendment) Act, 2013

A committee headed by Justice J.S. Verma, former Chief Justice of Supreme Court, was set up on December 23, 2012, to give recommendations on amending laws to provide for speedy justice and enhanced punishment for criminals in sexual assault cases. The Justice Verma Committee in its report submitted on January 23, 2013, agreed to most of the provisions of the Criminal Law (Amendment) Bill, 2012. Government wanted to amend criminal laws affecting women immediately and since the Parliament was not in session, the Criminal Law (Amendment) Ordinance, 2013 was promulgated on February 3, 2013. In the Budget Session, the Criminal Law (Amendment) Bill, 2013 was passed by the Lok Sabha on March 19, 2013, and by the Rajya Sabha on March 21, 2013. The President of India has accorded his assent to the Bill on April 2, 2013.

Substantive amendments in IPC, Cr.P.C and Indian Evidence Act have been made to effectively deal with the crime against women. Sentence of death has been provided as punishment in case of rape followed by death or vegetative state of the victim. For the first time acid attack, human trafficking, voyeurism, stalking etc. have been included as a specific offence and severe punishment has been prescribed. Non-treatment of victims of rape and acid attack by the hospitals (Government/Private) has been madepunishable. The police has been made accountable and disobeying of any directions of law (like not recording of FIR) has



been made punishable. Adequate provisions have been made to protect the women victim from harassment and humiliation during investigation and trial.

Internal Security

Terrorist activities in the hinterland continue to remain a threat. There have been three incidents of bomb blasts: first in Hyderabad in which 17 persons died, the second in Bengaluru in which there was no casualty and the third in Bodh Gaya in which no casualty was reported. The MHA has agreed to the request of the Bihar Government for handing over the security of Bodh Gaya Complex to CISF. In some of these incidents, the Investigating Agencies have been able to identify and arrest the persons responsible and in other cases the investigations are on. The Government is committed for safety and security of its citizens and in this regard the arrest of Yasin Bhatkal, Tunda, Haddi and solving of recent blasts cases proves this resolve.

Modernisation of State Police Forces

The Scheme for Modernisation of State Police Forces (MPF Scheme) has been extended for a further period of five years with effect from the financial year 2012-13 to 2016-17, with funding partly under non-plan and partly under plan. The items required by the State Police under mobility, weapons, equipment, training equipment, forensic equipment are funded under non-plan. The construction/upgradation of police stations/outposts, police lines, police housing, forensic science laboratories and training infrastructure, construction of buildings are funded under plan budget.

Under the scheme, an allocation of ₹8,195.53 crore has been approved under non-plan and ₹3,750.87 crore under plan during the Twelfth Five Year Plan period (2012-17). In the current year, outlay for MPF Scheme is ₹750 crore under non-plan and ₹1,097 crore under plan. Mega City Policing in six cities namely, Ahmedabad, Mumbai, Chennai, Hyderabad, Kolkata and Bengaluru has been approved as a sub-set under non-plan component of MPF Scheme.

Crime and Criminal Tracking Network & Systems

Crime and Criminal Tracking Network & Systems (CCTNS), Mission Mode Scheme was approved in 2009 with a provision of ₹2,000 crore as a 100 per cent centrally-sponsored scheme to be implemented during 2009-12. This has now been extended up to March 31, 2015. A pilot launch of CCTNS was launched on January 4, 2013, which earmarked connectivity of nearly 2000 CCTNS locations in 25 States/Union Territories. The implementation of the project has picked up and contracts with System Integrators have been signed in different States/Union Territories.

BSF and NSC top appointments

he competent authority in the Central Government of India has appointed Devendra Kumar Pathak, IPS, presently working as Special Director General of Central Reserve Police Force (CRPF) to the post of Special DG, Border Security Force, with immediate effect and till the date of his superannuation or until further orders, whichever event takes place earlier.

The competent authority has also appointed J.N. Choudhury,

IPS, as Director General, National Security Guard (NSG) with effect from the date of his joining the post and till his superannuation on May 31, 2015, or until further orders, whichever event takes place earlier.

Arvind Ranjan, IPS, Director General, NSG has been appointed as Director General in Central Industrial Security Force (CISF) from the date of taking over the charge of the post and till the date of his superannuation on April 30, 2015, or until further orders, whichever event takes place earlier.

Cisco and Finmeccanica explore global defence and security market

C isco and Finmeccanica announced a new global partner agreement that will combine their complementary technology strengths in the defense and civil industries to create innovative products and systems for the global marketplace.

Building on a long-standing and successful relationship between the two companies, the expanded, collaborative alliance combines Finmeccanica's industry expertise and solutions with Cisco's IT, networking and communications innovation. This will enable the two companies to bring together their knowledge and expertise to jointly create industry-leading service offerings and solutions targeting the defence, security and aerospace industries, as well as the

Russian Helicopters showed strong production and financial growth in 2013

Tn 2013, Russian Helicopters, a subsidiary of Oboronprom, part of State Corporation Rostec, produced 303 helicopters for Russian and international customers, with an anticipated consolidated profit in excess of 140 billion roubles. Preliminary results were voiced at the Russian Helicopters board meeting which reviewed performance in the helicopter sector over the past year and outlined its main priorities for 2014.

"In 2013 Russian Helicopters continued to develop as a modern, highly efficient and dynamic Russian company," Russian Helicopters CEO Alexander Mikheev said. "We completed the state defence order in full, supplied combat helicopters to export and produced dozens of batches of safe, reliable commercial helicopters for Russian and international customers."

We continued to modernise production over the past year. Over 800 news pieces of machinery were installed in our facilities, and more than 100 events designed to make us more eco-friendly and improve safety were held. Implementing investment projects delivered significant results: retooling the processing, plating, and composite industries was concluded. Output per employee increased by 12.4 per cent to 3.4 million roubles per staff member.

The portfolio of confirmed orders, as of December 11, 2013, stood at 772 helicopters worth over 370 billion roubles. Russian Helicopters' order book is 100 per cent full for 2014, 73 per cent full for 2015 and 25 per cent full for 2016.

Russian Helicopters' priorities for the coming year have been set. Notably, the vector of work on major projects in the light, medium and heavy classes of helicopters has been defined. One of the key priorities for 2014 will be slashing the timeframe for bringing the new multi-role Ka-62, Mi-38, and Mi-171A2 helicopters to market. An agreement with the company AgustaWestland was signed, creating a new light helicopter with a weight of 2.5 tonnes, in a joint venture. Russian Helicopters and Turbomeca signed an agreement on opening service centres to support the commissioning of the Ka-226T and Ka-62, equipped with French engines.

In 2014, work on developments and the creation of new helicopter models will continue at the innovation cluster at the company's National Helicopter Manufacturing Centre in the Moscow region town of Tomilino, where Russian Helicopters' key intellectual assets, the Mil Moscow Helicopter Plant and Kamov Design Bureau, are based.

In servicing, Russian Helicopters will continue to follow its strategy

emerging needs in sustainability and smart connected cities and environments that both companies can take to market.

The partner agreement between Finmeccanica and Cisco also expands the two companies' sales collaboration globally and accelerates coordinated joint go-to-market activities at both global and country levels.

This relationship is a significant step forward for both companies due to the opportunities in the global systems integration field for both the defence and civilian markets. By utilizing both companies' technology and expertise Finmeccanica and Cisco will be positioning as worldwide leaders in innovative systems and solution development, offering superior and ground-breaking products and strengthening the respective strategies as system integrator and IT leader.

of developing a global system for post-sales services, which will allow it to move to "full life-cycle" helicopter sales, ensuring helicopter sold receive top-notch support throughout their service life.

In terms of corporate development, Russian Helicopters will continue to optimise its management systems to ensure a smooth transfer from financial to operational management models. The main goal will be bringing to a close the restructuring and optimisation of the key production and specialised enterprises that have come together to form Russian Helicopters.

Rockwell Collins completes acquisition of ARINC Inc

Repleted the acquisition of ARINC Inc from the Carlyle Group for \$1.4 billion.

"With this move we take a major leap forward to realising our vision of providing a richer set of seamless information management solutions that encompass the aircraft and ground-based systems," said Kelly Ortberg, CEO and President of Rockwell Collins. "The acquisition represents an exciting new growth platform for Rockwell Collins and shifts the balance of the company towards the expanding commercial aviation sector."

"Combining ARINC's high-performance, high-quality and highassurance networks and services with our information systems onboard the aircraft strengthens our ability to deliver improved efficiency and safety, and enhanced connectivity," added Ortberg. "In addition, the acquisition opens up adjacent market opportunities by leveraging ARINC's strong presence in airport information systems and the broader transportation and security segments."

The company expects the impact of the acquisition to be EPS accretive once certain transaction and integration costs have been incurred. The majority of integration activities are expected to be completed in six to nine months. For the near term, customers can expect business as usual, and should continue to work with their current sales representatives, customer service centres and web-based resources.

To serve the best interests of the industry, and avoid any perceived conflicts of interest, Rockwell Collins has completed the sale of ARINC's Industry Standards Organization to SAE International simultaneously with the completion of the ARINC acquisition. In addition, due to a lack of fit with its long-term strategy, Rockwell Collins has initiated preparatory efforts to divest ARINC's Aerospace Systems Engineering and Support business, which provides military aircraft integration and modifications, maintenance, and logistics and support.



TECHNOLOGY News



US Army scientists' 19 patents lead to quantum imaging advances

amera technology has advanced beginning in the 1800s from an eight-hour development process to pictures generated in seconds. Over the years there has been monochrome, Kodachrome and Polaroid — today digital imaging is popular. Quantum imaging in the military is also advancing at a rapid pace.

Recently, Ronald E. Meyers and Keith S. Deacon of the US Army Research Laboratory (ARL) part of the Research Development and Engineering Command, received a patent from the US Patent and Trademark Office on November 26 for their novel quantum imaging technology called, "System and Method for Image Enhancement and Improvement."

The newest development combines a novel method of photon measurement and computing to create a sharp image. This patent is the 19th for Meyers in the areas of quantum technology and physics. It builds on the team's portfolio from last year with patents to build a high resolution image out of low-resolution transmission and also one to produce high resolution image frames using quantum properties.

Meyers, the leader and principal investigator for the Quantum Imaging Information Science and Technology mission programme of the Computational and Information Sciences Directorate at ARL, looks at his Quantum Imaging Camera as, "a new and better way to get a picture."

In addition to being funded by the Army, Meyers has collaborated with Air Force funded quantum research efforts. The Navy has employed quantum cascade lasers to illuminate a sample surface with one or more wavelengths, according to the Naval Research Laboratory website. "But the Army has led the development of quantum imaging research based on the needs of the Soldier," Meyers said.

The Army problem is that ground troops need a way to see a long distance through turbulence in an operational environment. The optical turbulence that Soldiers see during a real-world mission is caused by wind and heating and is exacerbated by smoke that degrades camera images and makes pictures much less clear, he said.

As camera technology evolves, this new way to image remote objects is helpful because Soldiers can identify what they see from a longer, safer distance in a way that classical imaging doesn't allow, Meyers said. There are classical imaging techniques, that use infrared or amplifying light for night time use, but you get better results utilizing quantum imaging, also called ghost imaging, he said. "We are overcoming problems that classical imaging can't cope with, and solving them with better physics solutions enabling quantum imaging applications."

The theory itself behind quantum imaging is not the same as it is with classical imaging, and has key beneficial differences. Typically ghost imaging pictures come from quantum properties of photons, electrons and atoms to produce an image of an object that the camera itself cannot see, Meyers said.

ARL's imaging uses nonlocal multi-photon quantum interference, related to entanglement, to cancel atmospheric turbulence and abnormalities. The method works at virtually all wavelengths for passive and active imaging. The researchers demonstrated the experiments at a distance of 2.33 km away from the target.

Since the team invented remote ghost imaging and published

the first ghost image of a remote object in 2007, that of a toy soldier, they have improved the quantum imaging physics and they understand the phenomena better. The experimental set-ups are also much more efficient than they were five years ago, Meyers said.

They expected to see improvements during more recent testing but "what we didn't expect is that even with high noise, low signal strength, and turbulence, the images were incredibly sharp," Meyers said. The quantum imaging system and method's result produced clear long distance images through strong turbulence and low light conditions. When the team first started studying ghost imaging in 2003 they demonstrated this technique using lasers. Meyers said, "The greatest challenge back then was getting good measurements."

"I knew in the beginning that we had to conduct the experiment in a way that anybody could repeat it with similar results," Meyers said. "Sometimes those images would take up to six hours



to produce, but the most recent experiments produced images in seconds." The research team's current goal is to experiment with different wavelengths to apply them to intelligence, surveillance and reconnaissance from the ground, a satellite or a military unmanned aerial vehicle. Future developments may also include entangled photons.

Meyers has performed research for the ARL since 1982. He was singled out as the Army scientist with the most patents earlier this year as the Army was named on Thomson Reuters 2012 Top 100 Global Innovator list. He said the achievement he was most proud of is "moving ghost imaging from a physics curiosity to a practical far-reaching technology now under development for the Army. This patented quantum imaging invention is another step for our team towards providing the Army with new generations of imagers that enhance situational awareness on the battlefield."

INTERNAL SECURITY Breaches

to have security issues. P

Cross-dresser and drunk jump airport fences in Newark, Phoenix

Paparazzi and Kanye West, security

n 2008, Kanye West was arrested for felony vandalism at LAX after smashing a photographer's camera. The fight went down at the American Airlines terminal when Kanye and his assistant smashed one camera and demanded a video tape from another paparazzo. Kanye and his assistant were both booked and Kanye was sentenced to some community service. Kanye West continues

always an issue



n Christmas Day, two men, one dressed in woman's attire and another totally drunk, climbed on to high-security fence at US airports, thus creating security incidents at two separate airports in Newark, New Jersey, and Phoenix, Arizona.

One showed "indications of possible drug and alcohol impairment." The other was wearing woman's clothing and was not interested in anything at the airport – instead he was seeking safety from someone who frightened him, police said. Both men were charged with trespassing and released.

Siyah Bryant, 24, allegedly mounted the barrier at Newark Liberty International Airport and it went unnoticed for a day. The next day a review of security camera footage revealed his ascent, according to the Port Authority police. The cross-dressed suspect then ran across two runways to get to Terminal C.

The breach at Newark exposed a failure of a \$100 million system

designed to protect New York City area airports. The Phoenix fence fiasco was the fifth in a decade at that airport.

A law enforcement official said Bryant told detectives he got spooked while in a car with someone and tried to get away. The fright was apparently enough to drive Bryant over two big barriers. He allegedly scaled an eight-foot exterior fence and then a 10-foot, high-tech fence equipped with motion sensors and CCTV cameras.

Also on Christmas Day, police in Phoenix arrested 49-year-old Robert Bump after he allegedly ran onto the tarmac at Phoenix Sky Harbor International Airport, police said. Tower officials saw a man climb over a fence and run onto the tarmac and taxiway, where he headed for a Southwest Airlines plane. The pilot shut down the plane's engines when told the man was approaching. The suspect, who appeared intoxicated, struck the plane's engine with his hands before heading towards the terminal, where he was arrested.

USB keys disappear, one found in downtown Ottawa

USB key handed out to an employee in the federal department tasked with helping Canadian companies compete for domestic and foreign security contracts vanished early in 2013. Till date they have not been able to find out where the USB key ended up.

Another USB key that was neither password protected nor encrypted was found on a downtown Ottawa sidewalk by a Good Samaritan. It contained protected information — albeit out of date details — of a federal project.

The two instances are among dozens of security incidents logged by Public Works and Government Services Canada over the last year in the capital, which has the largest slice proportionally of public servants in the country. The USB key losses are two of four investigated in 2013 by Public Works.





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