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54 YEARS of SP's SINCE 1964 DECADES OF BOUNDLESS EXCELLENCE

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In a country like India with limited support from the industry and market, initiating 50 years ago (in 1964) publishing magazines relating to Army, Navy and Aviation sectors without any interruption is a commendable job on the part of SP Guide Publications. By this, SP Guide Publications has established the fact that continuing quality work in any field would result in success.

Narendra Modi, Hon'ble Prime Minister of India

51 YEARS of SP's SINCE 1964

DECADES OF BOUNDLESS EXCELLENCE

While we at SP's cherish our journey started in 1964, founded by our Founder Editor and Founder Publisher Shri S P Baranwal; we do believe that the entry into 51st year and beyond is just a beginning for us. We therefore look forward to constantly evolving and expanding our qualitative efforts during coming years and coming decades.

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Visit of INS Sahyadri at Manila, Philippines

Indian Naval Ship Sahyadri currently on operational deployment to South China Sea and North West Pacific region in pursuance of India's 'Act East' policy was in the Manila recently for extensive interactions with the Philippine Navy.

Bilateral relations between India and the Philippines, based on shared values of anti-colonialism, strong democratic polity and South-South Cooperation have been growing significantly in the recent past, spurred by both economic as well as security engagements. Regular foreign policy consultations and security dialogue meetings have provided impetus to the bilateral relationship.

The visit of INS Sahyadri is aimed at strengthening bilateral ties and enhancing interoperability between navies of the two countries. INS Sahyadri is an indigenously built warship of the Shivalik class.

Inducted into the Indian Navy on July 21, 2012, the multi-role stealth frigate boasts of an impressive array of weaponry in her arsenal. Long-range anti-ship missiles, medium- and short-range surface-to-air missiles augmented by powerful guns of different calibres provide a formidable shield against all types of surface and air threats. The capability to carry two integral multi-role helicopters significantly enhances the potency of this ship. INS Sahyadri is presently being commanded by Captain Kunal Singh Rajkumar.

During the stay in harbour, various activities aimed at enhancing cooperation between the two navies. These included official calls on local naval and civilian dignitaries, reception on board INS Sahyadri, visits to the ship by the local populace, guided tours for Indian Naval personnel and professional interaction between personnel of both the navies.

The ship exercised with Philippine Navy ships for improving interoperability in communication as well as search and rescue (SAR) procedures. SP

PHOTOGRAPH: Indian Navy

Cover:
India will receive the latest models of 22 AH-64E Apache attack helicopters and 15 CH-47F Chinook heavy-lift helicopters. "This is a milestone in Boeing's expanding commitment to India," said Pratyush Kumar, President, Boeing India.

Cover images: US Army, PIB, Northrop Grumman

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India-US partnership on sound footing

With the Narendra Modi Government coming to power in 2014, the bilateral and strategic relationship with the United States of America has got transformed into a dynamic one with increased engagements at not just the government level but also at the industry level. In the area of defence, there is renewed enthusiasm on the part of the US companies. They believe that they could help India in its quest of becoming not only an indigenous defence equipment producing country but also being capable of exporting. There seems to be lot more willingness on the part of the US companies to transfer technology and make the Prime Minister's initiative come true.

In continuation of that partnership, the Minister of Defence Manohar Parrikar will be visiting the United States next month to build on the already deep engagement between the two sides in defence and strategic arena. It is significant that the visit has been scheduled within six months of the visit to New Delhi of the US Secretary of Defense Ashton Carter in June this year during which the path for long-term defence and strategic partnership between the two largest democracies had already been cleared. Parrikar's visit is expected to propel the Indo-US relationship to a new level.

The visit is taking place on the back of reported US decision to sell F-16s and Bell AH-1Z Viper attack helicopters to Pakistan. This US decision has irked India as it intends to rearm India's arch rival with sophisticated military aircraft which certainly are not meant for use against terrorists or the Taliban. US arms supplied to Pakistan have always been used against India and once again the Pakistani army has been successful in blackmailing the US leaders, writes Ranjeet Kumar.

According to the latest US Congressional Report, the Pentagon has cleared military hardware worth $5.4 billion after the 9/11 terrorist attack on the US Defense Headquarters in Washington DC and the World Trade Center in New York. This includes the sophisticated F-16 fighters. Interestingly, the military hardware were supplied to Pakistan in the 10-year framework, for which the logic given was that Islamabad needs capacity building to fight terrorists in its border areas.

US thus is engaging both the nations differently. For the US companies India is a huge market. US aerospace and defence behemoth, Boeing is consolidating its relationship with India, having been the country's partner in progress for nearly 70 years now. The recent wins by Boeing in India – for 22 AH-64E Apache attack helicopters and 15 CH-47F Chinook heavy-lift helicopters – have put the arc lights on the US major.

Similarly Thales is looking at more engagement with India. Patrick Mallon, Chief Technologist and Senior Thales Expert of Missile Systems, in an interview has talked about the company's 'Go to India' approach. Thales has been cooperating with the Indian private sector particularly large corporate players and SMEs to build transfer of technology and supply chain partnerships.

Meanwhile, WASS has pointed out that the government should honour the approved tenders and ensure that 'Make in India' is truly 'Make in India' and not backdoor entry of players who have lost out on tenders.

There is a lot to think about. Happy reading!

Jayant Baranwal
Publisher & Editor-in-Chief

Indian Navy scopes out Freedom class Littoral Ship at Malabar 2015

PHOTOGRAPHS: US Navy / Joe Bishop

With Exercise Malabar 2015 under way in the Bay of Bengal, Indian Navy personnel have gotten a comprehensive first operational look at Littoral Combat Ship (LCS) USS Fort Worth, the most recent of the Freedom class vessels built by Lockheed Martin for the US Navy and one of the sales opportunities the Pentagon has been looking to push in India. Currently on a 16-month rotational deployment in support of the Indo-Asia-Pacific Rebalance, USS Fort Worth is tailor-made to patrol the region's littorals and work hull-to-hull with other navies, as it is now with Indian frigates and destroyers as part of the sea phase of Malabar 2015.

The Freedom class ships have been likened to corvettes in terms of size, but are known to bring to the table a host of capabilities the Indian Navy has been interested in. The Navy in recent years has laid stress on inducting more offshore patrol vessels (OPVs) for rapid deployment to threat sites near shore with adequate firepower and agility to deter assymetric threats. The decision to field USS Forth Worth as part of the current exercise may be seen in the light of ongoing evaluation of that opportunity. The Indian Navy personnel on-board USS Fort Worth also got a chance to witness MQ-8B Fire Scout unmanned helicopter operations, though this was not the first time they saw this. SP

Parrikar to visit USA

Defence Minister Manohar Parrikar's visit to the US in December is expected to propel the Indo-US relationship to a new level

[By **Ranjeet Kumar**]

The impending visit of the Defence Minister Manohar Parrikar to the United States on December 9 and 10 would build on the already deep engagement between the two sides in defence and strategic arena. It is significant that the visit has been scheduled within six months of the visit to New Delhi of the US Secretary of Defense Ashton Carter in June this year during which the path for long-term defence and strategic partnership between the two largest democracies had already been cleared. Parrikar's visit would be expected to propel the relationship to a new level.

The visit is taking place on the back of reported US decision to sell F-16s and Bell AH-1Z Viper attack helicopters to Pakistan. This US decision has irked India as it intends to rearm India's arch rival with sophisticated military aircraft. which certainly are not meant for use against terrorists or the Taliban. US arms supplied to Pakistan have always been used against India and once again the Pakistani army has been successful in blackmailing the US leaders.

According to the latest US Congressional Report, the Pentagon has cleared military hardware worth $5.4 billion after the 9/11 terrorist attack on the US Defense Headquarters in Washington DC and the World Trade Center in New York. This includes the sophisticated F-16 fighters. Interestingly, the military hardware were supplied to Pakistan in the 10-year framework, for which the logic given was that Islamabad needs capacity building to fight terrorists in its border areas. However, Pakistan has always been successful in duping the US Administration, though, experts also say that the US has never been oblivious of the actual use of the weapon systems and platforms supplied to Pakistan. Though, both US and India claim to be strategic partners, US has never listened to Indian cries of arming Pakistan at the cost of India's security.

Defence Minister Manohar Parrikar's visit to US and expected meeting with US Secretary of Defense Ashton Carter may kickstart new dimensions in US-India relationship

Parrikar would take forward the decisions reached between the two sides and further discuss ways and means to promote the 'Make In India' programme of Prime Minister Narendra Modi in the defence sector. The US has also evinced keen interest in asking its defence sector to manufacture in India for its armed forces and export them too to Third World countries. Sources in the Indian Ministry of Defence said that the US and India would discuss the possibilities of raising the level of bilateral exercises and review the progress made in the joint working group on aircraft carrier as well as identify technologies that could be obtained by the Indian armed forces under the foreign military sales programme of the US Government. To create ground for the interactions between India and the US, two high level Indian delegations would be visiting the US. The India-US Defence Policy and Procurement Group will meet in Washington on November 13, in which Asha Ram, the Director General (Acquisition) would be leading the Indian side. The India-US Defence Policy Group will meet four days later, when the Indian Defence Secretary G. Mohan Kumar will have a meeting with the US Under Secretary of Defense Policy Christine E. Wormuth.

During the last visit of Ashton Carter four major issues were agreed upon. The first one was the New Defence Framework, which will build upon the earlier one and would give direction to the bilateral defence and strategic partnership for the next decade. Regarding projects the two sides finalised the joint development of Mobile Electric Hybrid Power sources and the Next Generation Protective Ensembles. The two sides had also agreed to pursue projects of co-development and co-production that will offer good possibilities for US defence sector to build defence partnership with Indian companies including the proposed 'Make In India' programme. The two sides had also agreed to take forward cooperation on jet engines, aircraft carrier design and construction, etc.

During Carter's visit, the two sides had discussed India-US strategic partnership and had also exchanged views on emerging regional security dynamics. During the forthcoming Parrikar visit to Washington, the two sides would carry forward the discussion on issues ranging from the current situation in South China Sea where the US Navy had dared the Chinese Navy to challenge, when the American warships had ventured very near to the artificial island created by China for military purposes and expanding its territorial limits in the South China Sea. Afghanistan, Central Asia, West Asia and India-Pakistan relations are also expected to figure during the talks. By ordering the 15 Chinook and 22 Apache helicopters, the Indian Government has already impressed the US Administration with its seriousness in engaging with the US defence firms. The US is already eyeing more orders from India. Boeing has offered the F-18 Super Hornets to be manufactured in India to fulfill the needs of the Indian Air Force for the medium multi-role combat aircraft. Also, Boeing has already announced that either Apaches or the Chinooks would be assembled in India.

If these developments materialise, US-India relations will assume new dimensions as the US companies would for the first time enter Indian defence sector directly. During Parrikar's visit to the US, all these issues will certainly be explored. SP

PHOTOGRAPH: PIB

Boeing's medium & long-term plans for India

[By **Pratyush Kumar,** President, Boeing India]

Boeing, the largest aerospace company in the world, is completing 100 years next year. As we look to our second century, it's clear that India is poised to play a pivotal role in the next evolution of Aerospace & Defence (A&D). We're committed to build an A&D future together with India. Pillars of our partnership with India are: Skilling to build an aerospace ecosystem in India, accelerating our efforts on 'Make in India', and supporting India's defence and aviation customers with Boeing's state-of-the-art and reliable products and services.

Skilling India for aerospace. Boeing is deeply committed to skilling for the aerospace in India across the entire ecosystem: skilling frontline factory workers who are key to 'Make in India', training engineers who will design next-generation aerospace platforms not just for India but for the world, and supporting advanced research and development consortiums with IISc and IITs to push the state-of-the-art.

We launched the second year of skilling for aerospace manufacturing in India in partnership with NSDC. The results are extremely encouraging; the trained workers delivered world-class quality at first-pass. We achieved 100 per cent employment for the first two batches. Encouraged by this experience, we plan to significantly scale it up in partnership with NSDC and the Ministry of Defence. Founded by Boeing with IIT Bombay and GoI's Department of Science & Technology, the National Centre for Aerospace Innovation & Research (NCAIR) consortium trains and prepares Indian industry for aerospace manufacturing. The Aerospace Network Research Consortium (ANRC) with IISc Bengaluru is another open collaboration that conducts strategic research/co-development of aerospace network technologies.

Accelerating 'Make in India'. Soon after India's PM Shri Narendra Modi launched the 'Make in India' initiative in September 2014, Dynamatic Technolgies and Boeing inaugurated a plant in Bengaluru to manufacture critical parts for the Chinook heavy-lift helicopters. In a state-of-the-art facility at a Tata company in Nagpur, Boeing manufactures advanced composite floor beams that form the 'spine' of the world's most advanced aircraft, Boeing 787-9. In July this year we announced a partnership with Tata to manufacture advanced aero-structures and aerial systems including unmanned. We have significantly upped our manufacturing activities in India, more than doubling our sourcing over the last year. Now, over half a billion dollars in product and services from India gets on our airplanes each year and we are working to increase that.

On the engineering side, Boeing has been working with India's Tier-1 IT & Engineering Services providers with a significant spread of partner engineers and engineering work statements sourced during the past decade. Boeing subsidiaries like CDG and Jeppesen also have a significant and growing engineering footprint in India. To further leverage India's deep engineering capabilities Boeing also plans to significantly expand its engineering footprint organically in the near term.

Helping our customers win. With 10 C-17 Globemaster strategic airlifters and 8 P-8I maritime surveillance and anti-submarime warfare aircraft delivered, Boeing is helping with the mission-readiness and modernisation of India's defence forces. C-17s have played a stellar role in numerous relief and rescue missions and P-8Is have enabled the Indian Navy to monitor the vast region of the ocean from the Strait of Hormuz to the Malacca Strait. The recent contracts of 22 AH-64E Apache attack helicopters and 15 CH-47F Chinook heavy-lift helicopters further strengthens our position as a long-term strategic partner for India's defence modernisation. Boeing will also continue to work closely with its defence customers to give superior mission readiness in servicing all our platforms.

India learned to fly on the wings of Boeing. More than 75 years ago, Tata Airlines operated DC-3 aircraft. Since then, with the 707, 747, 777, 737 and the game-changing 787, Boeing has been the mainstay of India's aviation sector with airlines such as Air India, Jet Airways and SpiceJet. Twenty-one 787s are now with Air India serving them to expand international routes and fuel-efficient operations. Commercial Aviation Services will also be a major focus area in providing our commercial customers a path towards achieving world-class operations.

Across all these areas, Boeing is ***"bringing the best of Boeing to India and bringing the best of India to Boeing"*** in a true win-win partnership. SP

PHOTOGRAPH: Boeing

Boeing-India: Growing from strength to strength

India will receive the latest models of 22 AH-64E Apache attack helicopters and 15 CH-47F Chinook heavy-lift helicopters. "This is a milestone in Boeing's expanding commitment to India," said Pratyush Kumar, President, Boeing India.

[By **R. Chandrakanth**]

US aerospace and defence behemoth, Boeing is consolidating its relationship with India, having been the country's partner in progress for nearly 70 years now. The recent wins by Boeing in India – for 22 AH-64E Apache attack helicopters and 15 CH-47F Chinook heavy-lift helicopters – have put the arc lights on the US major.

What began as a commercial sale of DC-3 aircraft about 70 years back to Tata Airlines has transformed itself into an enduring relationship, though there may been periods of lull in between. Boeing's relationship with India in the realm of defence too dates back to the 1940s when the Indian Air Force (IAF) flew the T-6 Texan or Harvard Advanced Trainer made by North American Aviation and the C-47 Skytrain Military Transport, a military variant of the DC-3, made by McDonnell Douglas.

After a fairly long gap, Boeing started to play an important role in the mission readiness and modernisation of the armed forces. In June 2011, India's Ministry of Defence signed an agreement with the US Government to acquire 10 Boeing C-17 Globemaster III airlifters. It was in 2013, Boeing bounced back with the delivery of C-17 Globemaster III airlifter and P-8i maritime surveillance and anti-submarine aircraft. This relationship has been further firmed up with India giving the green signal for purchase of the Apache and Chinook helicopters.

Milestone

India will receive the latest models of 22 AH-64E Apache attack helicopters and 15 CH-47F Chinook heavy-lift helicopters. "This is a milestone in Boeing's expanding commitment to India," said Pratyush Kumar, President, Boeing India. "This acquisition enhances the IAF's capabilities and offers us an opportunity to further accelerate 'Make in India.' Large sections of the Chinook fuselage are already manufactured in India and discussions are ongoing with our Indian partners to make Apache parts."

The Apache is the world's leading multi-role attack helicopter. The AH-64E Apache, the most modern variant also flown by the US Army, features enhanced performance, joint digital operability, improved survivability and cognitive decision aiding.

The CH-47F Chinook is an advanced multimission helicopter operated by the US Army and 18 other defence forces. The Chinook has proven its ability to operate in the range of conditions that typify the Indian subcontinent, including delivering heavy payloads to high altitudes.

"These new aircraft will provide world-class capabilities to meet the IAF's missions today, tomorrow and well into the future," said David Koopersmith, Vice President and General Manager, Boeing Vertical Lift division. "This agreement represents another major step forward in our long and successful relationship with India." India is the 14th nation to select the Apache and the 19th nation to select the Chinook.

"The Apache and Chinook represent the best of high-performing technologies that will modernise India's defence capabilities," said Dennis Swanson, Vice President, Defense, Space & Security in India. "We look forward to delivering the newest Apache and Chinook to our customers and remain focused on delivering on its commitments to the IAF and India's Ministry of Defence (MoD)."

AH-64E Apache attack helicopter

PHOTOGRAPH: US Army

Boeing Expands Footprint in India

Headquartered in Delhi, Boeing's India operations include a corporate office in Delhi, the Boeing Research & Technology center in Bengaluru, and field service offices in Mumbai and Delhi. Boeing subsidiary, Jeppesen, a provider of flight navigation solutions, is well established in Hyderabad. Two other Boeing subsidiaries, Narus in Bengaluru and Continental DataGraphics in Chennai, are also expanding their footprint in the country.

Boeing, along with its subsidiary companies, employs over 400

employees in the country. Today, as Boeing's partnership with India is expanding to meet the country's larger aerospace and defence requirements, it is also rapidly building sustainable value and expertise in the Indian aerospace sector.

Boeing Defense, Space & Security

On January 1, 2009, the Government of India purchased eight Boeing P-8I long-range maritime reconnaissance and anti-submarine aircraft. The P-8I is an India-unique variant of the US Navy's P-8A Poseidon, a development from the Boeing 737-800. In June 2011, MoD signed an agreement with the US Government to acquire 10 Boeing C-17 Globemaster III airlifters.

Boeing Defense, Space & Security has a rich portfolio of products and services on offer to India, besides the helicopters, and Harpoon missiles. The Boeing portfolio also extends to unmanned systems, security solutions, services and support, and network-centric operations systems.

CH-47F Chinook heavy-lift helicopter

PHOTOGRAPH: USAF

Industry Partnerships

Accelerating the development of an indigenous aerospace and defence ecosystem is a central part of Boeing's strategy in India. Boeing's industrial partnership programme is focused towards identifying and engaging with companies in India for supporting aerospace and defence programmes across the Boeing enterprise.

With a view to capitalising on India's competencies, Boeing is collaborating with Indian partners to build capability that will be globally competitive. These industrial partners are raising their bar to deliver world-class quality, cost-efficiency and productivity, and are becoming an important part of the company's worldwide supply-chain for some of the most advanced aircraft in the world.

Since 1997, Boeing has worked with India's premier software development companies – including HCL, Infosys, Wipro and Tata Consultancy Services (TCS) – on several projects related to systems re-engineering and development, web enabling, e-business applications and long-term maintenance. In 2005, Boeing added a variety of knowledge-based engineering and data analysis projects, as well as aircraft design activity, to its existing IT work in India.

The Hindustan Aeronautics Limited (HAL) became the single-source producer of 757 overwing exit doors in 1991. HAL has manufactured the 777 uplock boxes, 777 flaperons, F/A-18 gun bay doors, F/A-18 wire harnesses, P-8I weapons bay doors, P-8I tailcones and P-8I identification friend-or-foe transponders.

The Bharat Electronics Limited (BEL) has delivered the Indian-designed Data Link II for the P-8I, a communications system that enables exchange of tactical data and messages between the Indian Navy aircraft, ships and shore establishments. BEL has also delivered the identification friend-or-foe interrogator, a battle management system that enables the aircraft to distinguish friendly aircraft and forces. Finally, BEL is on contract to provide F/A-18 flight deck cockpit panels. The Electronics Corporation of India Limited (ECIL) provides the Speech Secrecy Systems for the P-8I.

In addition to defence public sector undertakings, India's well-reputed private companies play a large role in Boeing industrial strategy. Dynamatic Technologies and Tata Advanced Materials Limited (TAML) have already delivered P-8I power and mission equipment cabinets, and TAML is also on contract to provide P-8I auxiliary power unit door fairings. Dynamatic Technologies is on contract to manufacture the aft pylon and cargo ramp assemblies for Boeing's CH-47F Chinook. Avantel delivers the mobile satellite systems for the P-8I and Maini and TAL Manufacturing Solutions are on contract to provide C-17 ground support equipment.

Research & Technology and University Partnerships

Since 1995, Boeing has a R&D presence in India, when collaborative research in aerodynamics was established with the National Aerospace Labs (NAL) in Bengaluru. This has developed into a series of projects in aerodynamics and advanced analysis methods at NAL, Indian Institute of Science (IISc) and Indian Institute of Technology (IIT) Kanpur.

In 2005, Boeing entered into a strategic research partnership with IISc Bengaluru. The Boeing-IISc partnership focuses on research in materials sciences for structural alloys, smart materials and structures, process modelling and simulation. The Aerospace Network Research Consortium (ANRC) was set up in 2008 with the IISc and industry partners, HCL Technologies and Wipro. This consortium has conducted research and co-developed technologies related to wireless aerospace networks.

In 2009, Boeing further expanded its R&D footprint in India by establishing the Boeing Research & Technology India Center, an Indian counterpart of Boeing's Research & Technology organisation in the United States.

In 2011, Boeing signed an agreement with the Department of Science and Technology (DST) to establish a centre to promote aerospace manufacturing capabilities in India. A consortium model was adopted with Boeing, DST and IIT Bombay joining hands as the founding partners to create the National Centre for Aerospace Innovation and Research (NCAIR). This centre, located on the campus of IIT Bombay, enables Indian and multinational organisations – such as NAL, HAL, Godrej, DMG, MORI SEIKI, Sandvik Coromant and Delcam – to collaborate, and develop solutions.

Also based in Bengaluru, and staffed with modelling and simulation engineers, the Boeing Strategic Development & Experimentation (SD&E) Center provides defence experimentation and decision-support services to understand the future needs of the Indian armed forces.

The relationship continues to grow, based on trust and understanding the needs of a nation which is emerging as a major economic powerhouse. SP

WASS cautions against 'back door' entry into India

While the 'Make in India' concept is good, there are some companies which after failing in the tenders are trying to enter the Indian defence market through this concept

Black Shark heavyweight torpedo

PHOTOGRAPH: WASS

[By **SP's Correspondent**]

WASS, which is recognised worldwide as one of the most important torpedo manufacturers, is of the view that while the 'Make in India' concept is good, there are some companies which after failing in the tenders are trying to enter the Indian defence market through this concept, said Antonio Budroni, Regional delegate of WASS. He cautioned that if this is allowed, India would end up getting defence equipments which are not in compliance with the requirements as per tenders floated.

Budroni said that as a result, the complete Indian acquisition procedure will be jeopardised, along with its reputation in the defence market. In fact, companies that invested huge amounts of money to qualify all the tests and verification that the Defence Procurement Procedure (DPP) imposes in a tender will see their work thrown out, because the product from a loser company is coming back in the form of the 'so-called' 'Make in India' programme.

Budroni also brought out that WASS, which is present in India since 1976, has had industrial relationship with Indian companies well before the 'Make in India' programme. Work share with the public sector undertakings (PSUs) of more than 50 per cent is in place since 2005. Indian suppliers are enumerated as its vendors since 2000. A number of proposals for collaboration with the Defence Research and Development Organisation (DRDO) have been delivered in recent past to build a common product, developed for the world market.

WASS is the resultant winner in the Scorpene class submarine tender for heavy weight torpedoes (HWTs), the only one that passed all the tests, requirements and field evaluations, said Budroni. The tender includes, also as a first step, transfer of technology (ToT) of 30 per cent of the product. The Black Shark torpedo is the most advanced HWT torpedo proven at sea available in the market. It is fully integrated on-board most of the submarines of various classes in the world, especially, in the Scorpene class which is already operational in several navies.

Budroni reiterated that it is keen to obtain this contract to start indigenisation of the Black Shark torpedo, transferring during the period very high key technologies in India through the already selected Indian vendors who are already supplying high technology torpedo components for the WASS worldwide market.

It is hard to believe that a country like India will lose such an opportunity to get the most reliable and performing torpedo

Budroni said that it is hard to believe that a country like India will lose such an opportunity to get the most reliable and performing torpedo that will become indigenous through the WASS-India relationship. SP

LT GENERAL
P.C. KATOCH (RETD)

Nawaz Sharif's US visit – Implications for South Asia

As prelude to the Obama-Sharif meet, Pakistani Foreign Secretary Aziz Chaudhary proclaimed that Pakistan's development and deployment of tactical battlefield weapons was aimed at deterring India's 'Cold Start' doctrine. This has been obvious and in fact not stated for the first time though American scholars have been worried about Pakistani tactical nukes deployment on her naval vessels, their management on high seas with attenuated risks and possibilities of accidents that could be construed as nuclear attack.

But then the Obama Administration has always looked the other way despite blatant nuclear proliferation by Pakistan, not even interrogating A.Q. Khan, leave aside having him prosecuted and cutting off military aid and financial largesse to Pakistan. So, tactical nuclear deployment at sea too would be ignored. Not without reason Donald Trump recently indicated that Obama is caught in the legacy of Bush Administration. But what was significant about this US trip by Nawaz Sharif was that just prior to his departure, Army Chief Raheel Sharif divested Sartaj Aziz from the NSA portfolio replacing him with Naseer Khan Janjua, his own man – a recently retired Army General; completing the military siege of Nawaz Sharif and Pakistan's democracy. Janjua will ensure Nawaz Sharif is bound and delivered – when Raheel Sharif so wants. In a recent international conclave abroad, a Pakistani politician unofficially admitted that there was consensus in the Pakistani polity to improve connectivity with India and enhance mutual trade and commerce but the Pakistani military had put its foot down and so nothing can be done about it.

It is well known that Raheel Sharif had virtually warned Nawaz not to speed up relationship with India. So with US continuously backing the Pakistani military, where is the question of the Pakistani military give up her proxy war against India and improve relations. This situation suiting China is the other reason. Looking west, Raheel Sharif is crucial to the US power play in Afghanistan the Pakistani military having installed Mullah Mansoor as the Afghan Taliban chief, he being the religious teacher of Haqqanis who are ISI's tentacle in Afghanistan. That is why despite having failed to bring the Taliban to join the Afghan government, Obama Administration gave the sweet pill to President Ashraf Ghani that Pakistan would be able to persuade the Taliban. This also helped divert Ghani's attention to the heavy Taliban concentration along the northern borders particularly in the Badakshan region, not that the Pakistan assisted Taliban were not making gains all over, even attacking Kabul in conjunction Haqqanis and Pakistani security personnel operating in guise of Taliban.

The lightening takeover of Kunduz and the capture of Warduj province east of Kunduz threaten Central Asia as well, severing the Kabul-Tajikistan highway and forcing Russia to increase troop deployment in Tajikistan with whom it has a security arrangement. It is but logical that if the stay of US-NATO troops in Afghanistan has been extended, the route of their supply will continue to be via the port of Karachi and all the way up through land route criss-crossing Pakistani territory. So the chances are that Pakistan will continue to be given a free hand in Afghanistan both by Obama and China even as latter is emphasising the need to rebuild Afghanistan. It goes without saying that Chinese strategic lodgment in Gigit-Baltistan and plans to advance to the Persian Gulf worries the US even as Chinese oil and copper extraction in ISAF secured regions had irked Washington. Extension of US deployment in Afghanistan coinciding with Obama's tenure – reduced to 5,500 strength by early 2017 – implies US will probably continue to maintain its current counter-terrorism task force at Bagram airbase, retain a small special operations presence at Kandahar and Jalalabad airfields plus continue with its headquarters in Kabul. But actually this means little with a resurgent Taliban and the ISIS having taken control of seven districts of Nangarhar province of Afghanistan already.

Obama's game plan apparently is to deter Russian and Chinese influence in the region through increased instability and Pakistani military is crucial to that plan whether Pakistan remains a puppet democracy or Raheel Sharif engineers another army coup. USSF intelligence that an ISI operative was directing Taliban from the 'Doctors Without Borders' hospital in Kunduz which led to the US bombing it, shooting down of a C-130 aircraft over Jalalabad on October 1 and an F-16 recently hit by Taliban fire over Paktia province are of little consequence. So, Pakistani military will retain full control of Pakistan, continue with its state policy of terror against India and Afghanistan, continuing to gain ground in Afghanistan. If instability increases in Pakistan in the process, it doesn't affect the military but suits the US as well in countering Chinese influence.

But then the much hyped Nawaz-Obama meeting turned out to be mostly gas for Pakistan, akin to her nuclear hype. Sure US will give 8 x F-16s to Pakistan subject to Congress approval, but that was about all other than Michelle Obama announcing $70-million programme for girl education in Pakistan. Pakistan's bid to get US mediation as well as bagging a US-Pakistan civilian nuclear deal were non-starters, some US lawmakers already having written to Obama prior to the meet not to agree to any civil nuclear deal with Pakistan. The actual snub to Pakistan came when soon after the Nawaz-John Kerry meet the Obama Administration declined to even acknowledge Islamabad's complaint about alleged Indian interference in Balochistan and FATA. On the contrary, Nawaz was told Pakistan needs to put additional efforts to target all terrorists on its territory. So despite Pakistani military machinations, Nawaz Sharif would have discovered it is not possible to eat the cake and take it home too. So, nothing has actually changed in South Asia with Pakistan continuing to generate terror. SP

AIR MARSHAL
B.K. PANDEY (RETD)

Importance of life-cycle cost

In view of limited financial resources and consequently low budgetary allocations for defence, it would be necessary to factor in life-cycle cost in the selection of defence equipment

The expression 'Life-cycle Cost' related to military hardware, whether a tank, warship or aircraft, pertains to the total cost of initial acquisition of the equipment, expenditure on maintenance for it to remain fit for operational deployment and the cost of operating the equipment over its entire life as defined by the original equipment manufacturer (OEM). This concept would apply also to all other military systems including software-based equipment such as command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) systems. In other words, life-cycle cost refers to the cost of particular military equipment and the supporting elements over their entire life from 'cradle to grave'.

The methodology of computing the total cost of ownership of defence equipment acquired through either development within the country or through imports, was originally evolved in the early 1960s by the US Department of Defense. It has since then been adopted by various countries, such as the United Kingdom, Australia and more recently by India as well. Also, with the ever tightening control on defence expenditure and shrinking defence budgets of nations across the world, reduction of life-cycle cost has become an inalienable imperative. Ways and means of reducing life-cycle cost has been an area of ever-increasing focus of global aerospace majors to remain competitive and also by the user nations to remain within the bounds of financial affordability.

Finalisation of contract for Airbus A330 MRTT selected for the IAF long ago is delayed possibly due to lack of understanding of 'life-cycle cost'

When a nation procures defence equipment in sizeable numbers, it may be advantageous for the buyer nation to also set up the facilities to assemble or manufacture in-house a major portion of the total number of units contracted for, acquire the latest technologies through transfer of technology, obtain the necessary documentation and have adequate number of personnel trained to respectable proficiency levels. For example, in the tender for the 126 Rafale combat jets for the Indian Air Force (IAF) from Dassault, the OEM was required to supply 18 aircraft directly in flyaway condition. The remaining 108 platforms were to be manufactured in India in collaboration with an Indian partner. Apart from the fact that this arrangement would have contributed to reduction in the unit cost of the equipment, the manufacturing facilities established in the process would have later undertaken manufacture of spares and would have provided maintenance support for the fleet throughout its service with the IAF as well as would have undertaken midlife upgrade thus reducing life-cycle cost significantly. Unfortunately, this particular tender proved abortive.

However, there is similar arrangement with the ongoing contract with Sukhoi of Russia in case of the Su-30MKI fleet of 272 aircraft of which only 40 have been received directly from the OEM in flyaway condition and the remaining are being manufactured under licence by the Indian aerospace major the Hindustan Aeronautics Limited. The offer from Airbus-Tata Advanced Systems Limited consortium to supply 56, C-295 medium-lift military transport aircraft to replace the ageing fleet of Avro aircraft in the IAF is also formulated on similar lines with 16 aircraft supplied directly from the Airbus factory in Seville, Spain, and 40 platforms to be manufactured within the country at a facility yet to be set up.

As is generally the case, the initial cost of acquisition of military assets is high. One of the reasons for this is the relatively lower volumes of production when compared with non-military hardware. The total quantities produced are low primarily because the demand is low and there are a number of impediments, political or otherwise, in promoting global trade of military equipment. Besides, the cost of operating and maintaining military equipment over its complete life-cycle which may extend up to 40 years or even more, is in fact much higher than the initial acquisition cost. This is one of the important factors that should and must be taken into account in the process of selection of the equipment. For example, the cost of operating the fifth-generation combat aircraft like the Lockheed Martin F-22 Raptor works out to $44,000 per hour. As against this, the cost of operating the fourth-generation combat aircraft Gripen from Saab of Sweden is only $3,000 per hour. The question for a nation scouting the global market for combat aircraft then boils down to whether it must go for the F-22 Raptor or make do with the Saab Gripen.

In the procurement of a military aircraft therefore the decision must not be based on the initial procurement cost alone. While the low price quoted for a particular piece of hardware may appear attractive, its life-cycle cost may turn out to be much higher than that of an equivalent platform where the significantly higher unit cost is more than compensated for by the much lower life-cycle cost. European and American military aircraft generally fall in the latter category, i.e high unit cost but much lower life-cycle cost.

The difference in the total operating cost over the complete life-cycle of the two aircraft would be important from the point of view of affordability and limitations of future budgetary support. In view of limited financial resources of the nation and consequently low budgetary allocations for defence, it would be necessary to factor in the life-cycle cost in the selection of defence equipment whether for import or domestic production. SP

PHOTOGRAPH: Airbus Defence and Space

PHOTOGRAPH: Thales

Thales 'Go to India' approach is good

Thales' strategy of developing its industrial footprint in India is in line with the Indian Government's 'Make in India' policy to develop the industrial defence base of the country. ***Patrick Mallon****, Chief Technologist and Senior Thales Expert in Missile Systems, in conversation with* ***Neetu Dhulia*** *of* ***SP's M.A.I.***

***SP's M.A.I.* (SP's): The air threat envelope has become more challenging in the last few decades. What is your perception of current and future air threat?**

Patrick Mallon (Mallon): Over a period of time, air threat is increasing exponentially both in range and altitude. Due to the rise of air power which initially started with fighter/bomber aircraft, air defence has evolved.

From past several years, attack helicopters, unmanned aerial vehicles, cruise and ballistic missiles became part of the air threat.

In the Indian Army's vision of the future, the army must progress into a modern net-enabled force, which is capable of providing air defence protection to field forces and strategic assets against the complete spectrum of air threat.

SP's: Do you keep the above air threat in mind while planning your air defence systems?

Mallon: Thales holds decades of experience and is active in anticipating the future threat; working with customers to provide the next-generation of effective solutions.

Thales has been working with customers to address evolving threats through Thales Advanced Air Defence solutions that ensures timely decision-making and effective responses for the protection of military forces, key assets, nations and citizens around the globe. Thales is providing its customers with solutions and services that truly meet their needs. We do this by applying all the technologies and innovations that have made us world leaders in the sector. Thales has a unique capability to design, develop and deploy equipment, systems and services that meet the most complex security requirements.

SP's: What do you feel should be the optimum mix of ground-based air defence systems in terms of guns and missiles or only missiles with multiple ranges?

Mallon: An optimum mix of ground-based air defence systems would be in terms of guns and missiles that would allow better target engagement.

As you are aware, missiles can take targets at a longer range and are more accurate. They are faster and with the new technology, they can manoeuvre themselves to engage the target. On the other hand, guns are effective to take targets at a shorter range, have a faster reaction time and are relatively economical.

SP's: Do you offer any air defence gun systems?

Mallon: Thales' RAPIDFire is a gun system adapted to both vital assets and fixed points defence, as well as mobile troops or convoys protection missions. This mobile, multi-role weapon system

is designed to respond to the new threats being encountered by armed forces today and in particular the low-cost targets which can attack in swarms and can saturate conventional missile defences. RAPIDFire benefits from 40 years of Thales' background experience in field proven weapon systems for French and overseas armed forces. With its powerful anti-aircraft gun, high performance 3D radar and versatile C2 module, RAPIDFire is optimised to defeat all types of air threats including fighter ground attack (FGA), helicopters or unmanned air vehicles (UAV) and cruise missiles or precision guided munitions.

Thales also has electro-optics such as the fire control radars and Flycatcher Mark 1 and Mark 2, Pharos, among others, which are integrated with gun systems for better accuracy.

SP's: StarStreak is a short-range air defence missile offered by Thales. Can you give some details like range, guidance system, anti-air threat capability, variants for various platforms like land, vehicle, helicopter, tank and so on?

Mallon: StarStreak high velocity missile was designed to provide close air defence against conventional air threats such as fixed-wing fighters and late unmasking helicopter targets. Thales has addressed the needs of military users around the world and introduced major improvements to provide increased range beyond 7 km, increased coverage and altitude and improved guidance precision against small targets. StarStreak has been designed to defeat these threats quickly and effectively and provide a vital capability in force protection. StarStreak is a truly versatile missile and is most effective when dealing with targets with short exposure times.

The key features of StarStreak are its proven capability against air targets, immediate launch capability—no seeker cool, down or lock-on required, high precision laser beam riding guidance which is immune to all known countermeasures, low signature rocket motor with short burn time, low laser beam energy levels ensuring no warning to target, automatic cut down capability for missile in flight (to avoid fratricide), zero maintenance missile—no in service support, precision strike/low collateral damage and insensitive munitions (IM) compliance.

StarStreak can be launched from the lightweight multiple launcher (LML) and Thales RAPIDRanger.

SP's: What about medium-range missiles from Thales?

Mallon: In the domain of medium-range missile systems Thales is a member of the EUROSAM consortium. EUROSAM is delivering the medium-range surface-to-air SAMP/T system. This system is qualified and has unequalled capabilities of interception of air targets and tactical ballistic missiles. Both missions can be performed simultaneously.

Thales is also delivering the engagement control function for medium-range surface-to-air missiles in the naval domain. This includes a command and control systems and multifunction radars.

SP's: Thales has a big presence in India for Army Air Defence radars, with Flycatcher Mk 1 and its upgraded version being the mainstay of the Army. What are your future plans to take this cooperation to the next level of radar systems?

Mallon: From decades, Thales has been offering the full scope of its defence expertise and experience to the Indian armed forces. Thales technologies allow the Indian armed forces to better protect the country which is their first mission. We would continue with our support to the Indian armed forces and facilitate its goals of self-reliance in defence equipment and modernisation including the next level of radar systems.

Thales looks forward to provide an upgraded and tech advanced radar systems for air defence.

SP's: Are you offering AESA radars along with the technology?

Mallon: The GS100 radar is under delivery to the Indian Air Force (IAF) for the LLTR programme. GS100 is part of the successful Ground Master family (including GM60, GM200, GM400), the air defence radars reference with more than 100 radars sold worldwide since 2008. It is equipped with an active array using the most advanced gallium nitride components for transmission. A comprehensive transfer of technology to the Bharat Electronics Limited (BEL) is ongoing so that a number of GS100 radars could be produced in India.

SP's: What about ground-based air defence systems for the IAF as the Army and the IAF jointly implement air defence in India?

Mallon: As shared earlier, we are providing radars to the Indian Army. We look forward to offer our solutions as per the requirements that would come up in the future as well.

SP's: Do you offer C4I integrated air defence solutions?

Mallon: Thales is offering world-class scalable solutions and services for Air Defence and Air Operations based on Thales equipment or integrating legacy or third party equipment in Open System Network Centric Architecture while committing to overall system performance.

SP's: Will you offer the technology for active seekers for missiles to India?

Mallon: Wherever our customers need our support, we are there and will continue to offer our flagship solutions that suit the requirement.

SP's: Can you tell us about missile and sensor systems of Thales which can be employed for the Indian Navy and the IAF?

Mallon: Thales has been a trusted supplier to the Indian Navy and IAF. We have already provided anti-submarine warfare sonar systems and mine-hunting solutions as well as long-range surveillance radar DA04 and LW08 for the Indian Navy. We continue to closely follow their requirements.

SP's: Thales has its presence in India since 1953. What are your plans to participate in the vision of Prime Minister Narendra Modi's 'Make in India'?

Mallon: We firmly support the 'Make in India' campaign that translates the government's vision of making India a global manufacturing hub. The initiative bodes well for the industry, thereby paving way for the country to become a defence exporter. Thales' strategy of developing its industrial footprint in India is in line with the Indian Government's 'Make in India' policy to develop the industrial defence base of the country.

The company has been actively contributing towards transfer of technology. We have been closely working with the Hindustan Aeronautics Limited (HAL) for over 50 years now, in all technological areas that can be used for military aircrafts. Also, our association with BEL dates back to its inception, i.e., over 60 years ago. The JVs with BEL and SAMTEL along with L&T Technology Services in the fields of civilian and select ground-based military radars, military avionics and airborne sensor systems, and avionics software respectively further reinforce our commitment to India.

Further, through its 'Go to India' approach, Thales has also been cooperating with the Indian private sector, particularly large corporate players and SMEs, to build transfer of technology and supply chain partnerships. SP

Navy's role is not only vital for national security, but also for national prosperity and development: Admiral R.K. Dhowan

The second edition of this year's biannual Naval Commanders' Conference was conducted at New Delhi from October 26-28, 2015. Chief of the Naval Staff Admiral R.K. Dhowan chaired the conference and addressed the Navy's top leadership on à host of issues including enhancing operational readiness of the Commands, infrastructure development, human resources management, coastal security, cyber security in the Indian Navy and foreign cooperation initiatives, amongst others.

Emphasising upon India's geographic location and the prevailing security situation which demands continuous vigil and readiness to respond to any contingencies in our area of interest, the Admiral urged the Commanders to maintain highest combat readiness of our platforms and diligent monitoring of developments in the maritime domain. He complimented all ranks of the Navy in maintaining a high tempo of operations with our ships deployed at extended ranges from our coasts, spanning from the South China Sea and Sea of Japan in the East to the Persian Gulf and the Atlantic Ocean in the West and at the same time remaining focused on maritime and coastal security in close liaison with other national authorities and agencies.

The Admiral lauded the efforts of the Navy for its focused action in deterring piracy attempts off the Gulf of Aden and closer to our islands in the Arabian Sea. Indian Navy's presence and proactive operations in the area have instilled a sense of confidence in the shipping industry and has been a major contributory factor in the recent decision by CGPCS to shift the eastern limit of high risk area from 78 degrees East to 65 degrees East. He highlighted that not even one Indian-owned ship has been hijacked since October 2008 due to the Indian Navy's proactive anti-piracy stance.

The Naval Commanders discussed the numerous initiatives taken by the Navy to usher in E-governance for providing greater impetus to the Indian Navy's integration with the 'Digital India' initiative wherein measures to further strengthen cyber security in the Navy were also examined.

The Naval Commanders deliberated on the key technological enablers for transformation of the Navy. The CNS complimented the Commanders for good pace of modernisation with focus on 'indigenisation' and urged continued and sustained efforts with progressive substitution of imports by 'Make in India'. These discussions should serve as a road map for the future Navy till 2030 as Indigenisation, in line with the 'Make in India' initiative of the Prime Minister, is the key driver for this road map. The Navy has been at the forefront of indigenisation with 47 ships currently under construction at Indian shipyards.

One of the focus areas discussed during the conference was the induction of manpower, aspects pertaining to training and skill development, and welfare of personnel. Consequent to 2015 being observed as the 'Year of the Sailor' in the Indian Navy, various aspects related to service conditions of sailors and their quality of life (including post retirement placements, accommodation and hospital facilities for them and their next of kin) were deliberated extensively. The CNS stated that men and women behind the machine are the Navy's greatest strength and are our greatest asset and their morale and well-being should always remain our primary concern.

Chief of the Naval Staff Admiral R.K. Dhowan addressing Naval Commanders at the bi-annual Naval Commanders' Conference in New Delhi

During the course of the conference, the CNS reviewed progress of various infrastructure projects that are in the pipeline and shall contribute towards capacity building. The need to adopt sustainable green technologies, recycling and waste management to reduce carbon footprint of our bases, in pursuance of the energy goals of our country as also to have 'zero carbon footprint' were also stressed upon by the CNS.

Consolidation and strengthening of the rapidly expanding aviation arm of the Navy was discussed. Deliberations were also held on infrastructure and manning requirements for new induction aircraft, including unmanned aerial vehicles and enhancement of surveillance in our area of interest.

The CNS reviewed the 'coastal security construct' and was satisfied with the steady progress made in strengthening the coastal security apparatus, viz. induction of FICs, ISVs and NC3 I project. He asserted the need to remain ever vigilant and focused towards our coastal security responsibilities through proactive coordination with other maritime agencies and coastal states.

In order to have a better understanding of the navies of the world and share best operational practices, the arrangements for the forthcoming mega event, i.e. International Fleet Review (IFR) scheduled at Visakhapatnam in February 16 were also reviewed.

The Conference also provided an opportunity to the Commanders to interact with the Ministry of Defence officials wherein various pending issues were discussed. The Admiral also released the revised 'Strategic Guidance to Transformation: A Passage Plan for the 21st Century', a document which identifies the key enablers and taskings for transforming the Indian Navy to meet its growing role and operational responsibilities over the coming decades.

In his closing address the CNS complimented all personnel of the Indian Navy for their professionalism and patriotism and exhorted them to prepare themselves and the Navy to meet all future maritime security challenges before the country. Operational consideration should remain our collective focus in the coming years, he said. The Navy's role is not only vital for national security, but also for national prosperity and development, he concluded. SP

PHOTOGRAPH: Indian Navy

Captain Krishna Swaminathan takes over command of aircraft carrier INS Vikramaditya

Captain Krishna Swaminathan has assumed charge as the second Commanding Officer of INS Vikramaditya, Indian Navy's new and formidable aircraft carrier at Karwar. The ship was commissioned at Severodvinsk in Russia on November 16, 2013, and has since been commanded by Captain Suraj Berry, NM.

Captain Krishna Swaminathan is an alumnus of the National Defence Academy, Khadakwasla, the Joint Services Command and Staff College, Shrivenham, United Kingdom, the College of Naval Warfare, Karanja, and the United States Naval War College, Newport, Rhode Island.

Captain Swaminathan did his schooling from Bishop Cotton Boys' School, Bengaluru, and Sainik School, Bijapur. He had previously commanded missile vessels INS Vidyut and Vinash, missile corvette INS Kulish and guided missile destroyer INS Mysore. He has a BSc degree from Jawaharlal Nehru University, New Delhi, a post-graduate diploma in personnel management from the Xavier Institute of Management, Mumbai, MA (defence studies) from King's College, London, M.Phil (defence and strategic studies) from Mumbai University and has submitted his thesis on international relations to the Mumbai University for a Ph.D degree. He has been on the staff of the Western Fleet, an instructor at the Defence Services Staff College, Wellington, and Director and Principal Director Naval Signals at Naval Headquarters. The officer was Naval Assistant to the Chief of the Naval Staff in his previous appointment.

INS Vikramaditya, the flagship and centre-piece of the Navy's operations, is under the administrative control of the Flag Officer Commanding-in-Chief, Western Naval Command, Mumbai and is part of the sword arm of Indian Navy, viz. the Western Fleet.

The ship is capable of operating MiG-29K/KuB fighters, Sea Harrier, Kamov-31, Kamov-28, Sea King, advanced light helicopter and Chetak helicopters from its deck. INS Vikramaditya is a significant accretion to the blue water capability of the Indian Navy and is very aptly described by its motto 'Strike Far, Strike Sure'. SP

Chief of the Naval Staff Bangladesh on a four-day visit to India

Vice Admiral Muhammad Farid Habib, Chief of the Naval Staff, Bangladesh Navy, is on a four-day official visit to India from November 2-6, 2015, to review the existing cooperation between both navies and explore future avenues. The Bangladesh Navy Chief was formally received by Admiral R.K. Dhowan, Chief of the Naval Staff, and accorded a ceremonial Guard of Honour at South Block lawns earlier in the day. Both the Chiefs had discussions on various issues during the day. The visiting dignitary had interactions with DG Coast Guard and senior officials of the Ministry of Defence (MoD) thereafter. The BN Chief of Naval Staff is also scheduled to visit HQWNC (Mumbai) and Garden Reach Shipyard at Kolkata.

India-Bangladesh relations are based on historical legacy, culture and geography. India was the first country to recognise Bangladesh as a separate and independent state. India and Bangladesh's geographical location presents an opportunity to develop mutual economies as well as enhance maritime security. In the last four-and-a-half decades, both nations have built a comprehensive framework to promote bilateral cooperation. The signing of 'Land Boundary Agreement' during the recent visit of Prime Minister of India to Bangladesh as well as acceptance of maritime boundary delimitation decision by arbitration tribunal indicates maturity of bilateral relations between both nations.

The cooperation between both navies span a wide spectrum of maritime activities that includes BN's regular participation in multilateral naval exercise MILAN conducted by the Indian Navy at Port Blair, navy-to-navy staff talks, cooperation in training as well as port calls by ships to each other's ports. Regular exchange of naval experts and professionals ranging from young cadets to high-level officials provide opportunities for sharing of experience and best practices.

Bangladesh Navy has been an active participant in India initiated maritime construct Indian Ocean Naval Symposium (IONS) and is scheduled to take over as Chairman of IONS from 2016-18. Bangladesh Navy is also planning to send a ship as well as high-level delegation during the International Fleet Review in February 16 at Visakhapatnam.

The visit by Vice Admiral Habib is aimed at consolidating existing naval cooperation as well as exploring new avenues. Areas of cooperation that are proposed to be discussed during the visit of BN Chief of Naval Staff include, option of coordinated patrolling along international maritime boundary line (IMBL), bilateral exercises between both navies, joint surveillance of exclusive economic zone, cooperation in hydrography, exchange of white shipping information, measures to augment maritime security in the Bay of Bengal, cooperation and collaboration in shipbuilding as well as cooperation in development of blue economy. SP

PHOTOGRAPHS: Indian Navy

AIR MARSHAL
B.K. PANDEY (RETD)

Dwindling combat fleet of the IAF

With far too many imponderables in the development of the Tejas Mk II, the chances are that this aircraft may not see light of the day

By early 2015, hopes of the Indian Air Force (IAF) of inducting 126 of the Rafale medium multi-role combat aircraft (MMRCA), equivalent of six squadrons, had begun to fade as the contract negotiations between the original equipment manufacturer (OEM) Dassault Aviation of France and the Indian Ministry of Defence (MoD) had encountered an insurmountable roadblock. Apart from the huge escalation in the overall cost of the project, the one major contentious issue between the two parties was that Dassault Aviation was not prepared to stand guarantee for quality standards and delivery schedule in respect of the 108 Rafale jets to be manufactured in India by the Indian aerospace major the Hindustan Aeronautics Limited (HAL). Dassault Aviation was insistent on nominating Reliance as the Indian partner. MoD was not prepared to relent as in the request for proposal (RFP), HAL had been specified as the Lead Integrator of the platform that would be built in India. As Dassault Aviation had submitted its bid in response to the RFP, acceptance of the terms laid down therein was implicit in their response.

Coping with Crippling Shortages

In April this year, Prime Minister Narendra Modi sprung a pleasant surprise by successfully negotiating a deal with the Government of France for the direct purchase of 36 Rafale jets to equip two squadrons. The much reduced number was indeed disappointing for the IAF in view of the rapidly dwindling combat fleet; but this move by the Prime Minister helped bypass the deadlocked contract negotiations and provide partial relief for the IAF. As the tender for the 126 MMRCA was then formally cancelled, at that stage it was not clear as to which route would be followed for the IAF to acquire the remaining 90 MMRCA to equip the remaining four squadrons.

As the fleet of MiG-21 and MiG-27s are due to be phased out by the end of this decade, the size of the combat fleet of the IAF will reduce drastically to about 25 squadrons as against the newly authorised strength of 42, down to just under 60 per cent. Given the evolving geopolitical situation in the region and the emerging challenges to national security, IAF is clearly not in a healthy state as it is desperately short of combat aircraft. If IAF is to shoulder its responsibilities effectively, it will need to induct soonest possible as many as 17 combat squadrons or around 300 combat platforms, all with multi-role capability.

For the two squadrons of Rafale jets to be inducted into the IAF possibly in the next three years, the IAF would have to invest heavily in the creation of maintenance and other supporting infrastructure. As the huge investment in this exercise would be disproportionate to the fleet strength of 36 aircraft and hence not a cost-effective proposition, it was only logical for the IAF to initiate a case for the induction of additional Rafale jets which it did. As per reports appearing in the media, ironically on Air Force Day in October this year, the Minister of Defence Manohar Parrikar had turned down the proposal for purchase of another 44 Rafale jets stating that the government did not have the funds to expand the acquisition of these platforms beyond the initial 36. Instead, the IAF must induct the improved version of the HAL-built Tejas designated as the Mk IA, to build up the combat fleet to the required level.

A Questionable Alternative

On being granted initial operational clearance (IOC), the Tejas Mk I entered service with the IAF 21 years after the project was actually launched in 1993. The generally touted figure of 32 years to IOC is not quite correct as it took over a decade for the project to actually begin after it was conceived in 1982. On account of the fact that the Tejas Mk I has a number of deficiencies, the IAF has restricted the initial order to just 40 to equip two squadrons. With the rate at which HAL can manufacture the Tejas Mk I, delivery against the order for 40 aircraft may be completed only by 2019 at best. When placing a small order for the Tejas Mk I, the IAF had indicated intentions to place a much larger order, possibly 100 or even more, of the Tejas Mk II which was expected to be equipped with a more powerful engine, the GE F-114 and hence deliver better performance.

Unfortunately, there are far too many imponderables in the development of the Tejas Mk II and the chances are that this aircraft which will practically be a new platform, may not see light of the day in a respectable time frame. In fact, unconfirmed reports indicate that the Tejas Mk II development programme has been shelved. Given the rate at which the combat fleet of the IAF is shrinking, in any case, it may not be in a position to wait indefinitely, without any certainty of time frame for the delivery of the Tejas Mk II.

Being aware of the limitations of the Indian aerospace industry in the public sector, the government is reported to be considering involving the aerospace industry in the private sector to build a new, improved version of the Tejas designated as the Mk IA. This version is expected to be lighter than the Mk I by around 800 kg which in real terms would translate into better performance envelop. But the moot point is whether the Indian aerospace industry in the private sector would be capable of stepping in and taking over the responsibility of developing and building the Tejas Mk IA where the Indian aerospace industry in the public sector has proved to be inadequate.

It should be evident from the above that there is little certainty of the Tejas Mk IA as also the Tejas Mk II being available to the IAF in the foreseeable future. Is it therefore reasonable to expect the IAF to wait indefinitely for either of the indigenous combat platforms the availability of which remains shrouded in uncertainty and accept serious compromise to national security? Or should the IAF be permitted by the government to acquire the badly needed combat platforms from abroad to restore the operational edge in the interest of national security ? The whole issue needs a review by a high powered committee consisting of representatives of all the stakeholders. SP

USAF awards contract for long-range strike bomber

[By **SP's Correspondent**]

The US Air Force recently announced the contract award of engineering and manufacturing development and early production for the long-range strike bomber, or LRS-B, to Northrop Grumman Corp.

"Over the past century, no nation has used air power to accomplish its global reach – to compress time and space – like the United States," Defense Secretary Ashton Carter said during a Pentagon briefing announcing the contract. "Today, it's vital to innovate and reinvest in the people, strategies and technologies that will allow America's military to be dominant in the second aerospace century. I've made such innovation a hallmark of my commitment to the future of America's military.

"Building this bomber is a strategic investment in the next 50 years, and represents our aggressive commitment to a strong and balanced force," Carter continued. "It demonstrates our commitment to our allies and our determination to potential adversaries, making it crystal clear that the United States will continue to retain the ability to project power throughout the globe long into the future."

Air Force Secretary Deborah Lee James said the LRS-B is critical to national defence and is a top priority for the Air Force. "We face a complex security environment," she said. "It's imperative our Air Force invests in the right people, technology, capability and training to defend the nation and its interests – at an affordable cost."

The future threat will evolve through the introduction of advanced air defence systems and development of more capable surface-to-air missile systems. The LRS-B is designed to replace the Air Force's ageing fleets of bombers – ranging in age from 50+ years for the B-52 to 17+ years for the B-2 – with a long-range, highly survivable bomber capable of penetrating and operating in tomorrow's anti-access, area denial environment. The LRS-B provides the strategic agility to launch from the United States and strike any target, any time around the globe.

"The LRS-B will provide our nation tremendous flexibility as a dual-capable bomber and the strategic agility to respond and adapt faster than our potential adversaries," said General Mark A. Welsh III, Chief of Staff of the Air Force. "We have committed to the American people to provide security in the skies, balanced by our responsibility to affordably use taxpayer dollars in doing so. This programme delivers both while ensuring we are poised to face emerging threats in an uncertain future."

The LRS-B contract is composed of two parts. The contract for the engineering and manufacturing development, or EMD, phase is a cost-reimbursable type contract with cost and performance incentives. The incentives minimise the contractor's profit if they do not control cost and schedule appropriately. The independent estimate for the EMD phase is $21.4 billion in 2010 dollars.

The second part of the contract is composed of options for the first five production lots, comprising 21 aircraft out of the total fleet of 100. They are fixed price options with incentives for cost. Based on approved requirements, the average procurement unit cost (APUC) per aircraft is required to be equal to or less than $550 million per aircraft in 2010 dollars when procuring 100 LRS-B aircraft. The APUC from the independent estimate supporting today's award is $511 million per aircraft, again in 2010 dollars.

Secretary of Defense Ashton Carter (centre) with Secretary of the Air Force Deborah Lee James and Air Force Chief of Staff General Mark A. Welsh III, during a press briefing to announce the award of the long-range strike bomber contract in the Pentagon on October 27, 2015

PHOTOGRAPH: US Air Force

Based on current LRS-B independent cost estimates, the Air Force projects the APUC for the programme will be approximately a third of the previous B-2 stealth aircraft.

"We believe this is a reasonable and achievable estimate. If we remain disciplined and keep programme requirements stable, we should beat this estimate," said Dr William A. LaPlante, Assistant Secretary of the Air Force for Acquisition.

The Air Force programme office conducted design efforts with industry over the last three years to ensure requirements for the aircraft were stable and allowed for the use of mature systems and existing technology while still providing desired capability.

With that said, agile acquisition processes have been built into the LRS-B development and production efforts to ensure the Air Force delivers system capabilities for the best value. The programme also effectively incentivises industry to achieve cost, schedule and performance goals.

The LRS-B is designed to have an open architecture allowing integration of new technology and timely response to future threats across the full range of military operations. This open architecture also provides the opportunity to retain competition across the lifecycle of the programme.

"The programme acquisition strategy has carefully integrated lessons learned from previous programmes and considered all elements of life-cycle costs in its design for affordability," Dr LaPlante added. "We are primed to deliver this capability in the most affordable, efficient way possible."

Basing decisions and future programme milestones for the aircraft will take place over the next several years. SP

MoD approves induction of women as fighter pilots

The Ministry of Defence (MoD) has approved the induction of women into the fighter (combat) stream of the Indian Air Force (IAF). This progressive step is in keeping with the aspirations of Indian women and is in line with contemporary trends in armed forces of developed nations. Since their induction into the transport and helicopter streams of the IAF, their performance has been praiseworthy and on par with their male counterparts. Inducting women into the fighter stream would provide them with an equal opportunity to prove their mettle in combat roles as well.

The first women pilots would be selected from the batch which is presently undergoing flying training at Air Force Academy. After successful completion of ab-initio training, they would be commissioned in the fighter stream in June 2016.

Thereafter, they would undergo advanced training for one year and would enter a fighter cockpit by June 2017.

Presently, the Indian Army is inducting women into the signals, engineers, army aviation (air traffic control), army air defence, electronics & mechanical engineers, Army Service Corps, Army Ordinance Corps, Intelligence Corps, Army Education Corps and Judge Advocate Generals Branches/Cadres. The Indian Navy is inducting women in the Judge Advocate Generals, logistics, observer, air traffic controller, naval constructor and education branches/cadres. The IAF is presently inducting women in the transport and helicopter stream of the flying branch, navigation, aeronautical engineering, administration, logistics, accounts, education and meteorology branches. With this decision to open up induction of women in the fighter stream, women have become eligible for induction in all branches and streams of the IAF.

The MoD has also taken up a comprehensive review pertaining to induction of women in armed forces, both in short service commission and permanent commission (SSC & PC) and once finalised more and more branches would be opened up for induction of women to give them the space which they deserve in the armed forces of the country. SP

Advanced Landing Ground at Walong becomes operational

Advanced Landing Ground (ALG) at Walong was inaugurated by Air Marshal C. Hari Kumar, Air Officer Commanding-in-Chief Eastern Air Command, Indian Air Force on October 23, 2015. Air Vice Marshal Manavendra Singh, Senior Officer-in-Charge Administration along with Senior Army Commanders attended the ceremony. Walong ALG was operational during 1962 Chinese aggression. Thereafter, it remained abandoned for a long time till it was decided in 2013 to reconstruct the ALG to make it fully air operational.

The project was very closely monitored by the chief engineer, North-eastern projects and Works Department at Headquarters Eastern Air Command resulting in its completion in a record time of 21 months. Close supervision and active monitoring by Project Monitoring Group (PMG) made it possible despite of its difficult location and natural obstacles in sustaining supply of material and machinery.

The Walong ALG will support Air Operations and will also facilitate the administration in the management of border areas. Besides this, the ALG will also provide air support in responding to the natural calamities, casualties evacuation, humanitarian assistance and supply of equipment and ration to the troops posted in far flung areas. SP

Air Marshal Khanna takes over as maintenance head of Indian Air Force

Air Marshal Virender Mohan Khanna assumes the responsibilities of Air Officer-in-Charge of Maintenance (AOM) at Air Headquarters, New Delhi, on November 1, 2015.

The Air Marshal was commissioned in the mechanical stream of aeronautical engineering branch in IAF on July 25, 1977. He is a graduate from the Regional Engineering College, Kurukshetra, and post-graduate in industrial engineering and management from IIT Kharagpur. He is also an alumnus of the prestigious Defence Services Staff College, Wellington. Additionally, he also acquired post-graduate diploma in Journalism and human rights.

During his career spanning 38 years, the officer has held important appointments of Director General (Aircraft) and Assistance Chief of Air Staff Engg (Transport and Helicopters) at Air HQ, Senior Maintenance Staff Officer and Chief Engineering Officer at HQ Eastern Air Command. The officer has also served at various base repair depots as Chief of Aircraft, Chief of Production and Planning and Commanding Officer. He was

PHOTOGRAPHS: IAF

instrumental in successful induction of large number of MI-17V5 helicopters, Hawk AJT and Pilatus aircraft.

Air Marshal had led a team of IAF pilots and maintenance officers which trained pilots and engineers of Botswana Defence Force thus strengthening Indo-Africa ties. Air Marshal has served as flight engineer and flown MI-8, MI-17 and MI-26, the largest helicopters in the world based at Chandigarh.

An avid sportsman, Air Marshal was also the member of two Indian Expeditions to Antarctica where IAF played a pivotal role in setting up Indian permanent bases Dakshin Gangotri and Maitri.

Air Marshal has been decorated by President of India with Vishisht Seva Medal and Ati Vishisht Seva Medal. SP

CH-53K helicopter achieves first flight

Sikorsky Aircraft Corp. recently announced the successful first flight of the US Marine Corps' CH-53K King Stallion heavy-lift helicopter protoype, known as Engineering Development Model-1 (EDM-1). The 30-minute flight signals the beginning of a 2,000-hour flight test programme using four test aircraft.

"EDM-1's first flight signifies another major milestone for the CH-53K helicopter programme," said Mike Torok, Sikorsky's CH-53K Program Vice President. "Having independently tested the aircraft's many components and subsystems, including integrated system level testing on the ground test vehicle, we are now moving on

to begin full aircraft system qualification via the flight test programme."

Sikorsky delivered the EDM-1 into the test programme at the company's West Palm Beach, Florida-based Development Flight Center in late 2014. During its 30-minute maiden flight the EDM-1 aircraft performed hover, sideward, rearward and forward flight control inputs while in ground effect hover up to 30 feet above the ground.

As the flight test programme proceeds, the EDM-1 will be joined by an additional three EDM aircraft to fully expand the King Stallion's flight envelope over the course of the three-year flight test programme.

"We have entered a much anticipated phase in this developmental programme," said Col. Hank Vanderborght, US Marine Corps Program Manager for Heavy Lift Helicopters. "We have experienced significant learning at the system and subsystem levels, which continues to build our confidence in the capabilities of the 53K. With first flight behind us, we look forward to execution of the development and operational testing and the deployment of this incredible heavy-lift capability to our warfighters."

Sikorsky, with support of others in the industry, is developing the CH-53K King Stallion heavy-lift helicopter for the US Marine Corps. The CH-53K King Stallion helicopter will maintain similar physical dimensions as its predecessor, the three-engine CH-53E Super Stallion helicopter, but will nearly triple the payload to 27,000 pounds over 110 nautical miles under 'high hot' ambient conditions.

Features of the CH-53K helicopter include a modern glass cockpit, fly-by-wire flight controls, fourth-generation rotor blades with anhedral tips, a low-maintenance elastomeric rotor head, upgraded engines, a locking, United States Air Force pallet compatible cargo rail system; external cargo handling improvements, survivability enhancements, and improved reliability, maintainability and supportability.

The US Department of Defense's Program of Record remains at 200 CH-53K aircraft with an initial operational capability in 2019. Eventual production quantities would be determined year-by-year over the life of the programme based on funding allocations set by Congress and the US Department of Defense acquisition priorities. The Marine Corps intends to stand up eight active duty squadrons, one training squadron, and one reserve squadron to support operational requirements. SP

LCH inches close to certification: Defence Minister takes detailed look

Light combat helicopter (LCH) completed performance trials paving way for finalisation of basic configuration. Defence Minister Manohar Parrikar visited the Hindustan Aeronautics Limited's (HAL) helicopter complex and had a detailed look on advanced features and armament fit of LCH prototypes.

"LCH is the only attack helicopter which can operate above 12,000 feet altitude with considerable load of armament", said T. Suvarana Raju, CMD, HAL. Based on successful completion of remaining flight trials, HAL expects operational clearance from CEMILAC very soon.

G. Gouda, Officiating Chief Executive of CEMILAC (Centre for Military Airworthiness & Certification) handed over a letter on completion of performance flight trials of LCH to Dr M. Vijaya Kumar, General Manager of HAL, in presence of Defence Minister and CMD, HAL.

LCH has completed performance flight trials which involved not only development testing at Bengaluru but also trials at extreme environment conditions such as sea level at Chennai, cold

weather at Leh, hot weather at Jodhpur and hot and high altitude tests at Leh. Accordingly, the helicopter can be cleared for weapon trials. With the finalisation of basic configuration, HAL can start production of LCH after the operational clearance. SP

PHOTOGRAPHS: Sikorsky, HAL

Arsenal star David Ospina's £16-million house broken into

Burglars recently raided professional footballer David Ospina's £16-million London house and stole the keys to his Mercedes while his wife and children slept upstairs, it has been revealed.

The two culprits, who also stole keys to the house, took his £1,00,000 car for a joyride before abandoning it in the capital, reports the *London Evening Standard*.

Arsenal and Colombia goalkeeper Ospina was away on international duty at the time for a World Cup qualifier against Peru.

But Ospina's wife, Jesica Sterling, and children were asleep upstairs during the raid.

The 27-year-old lives in the exclusive north London area of Hampstead Garden Suburb. Sterling, a model, revealed she now feels unsafe at night and claimed the burglary appeared to have been carefully planned.

The joyridden car was later discovered 10 km away at Wembley Park.

A Metropolitan Police spokesman revealed that they were investigating the incident. He said: "Keys to a car were stolen and the vehicle subsequently taken. The car was later recovered in the Wembley Park area. No arrests have been made at this time and enquiries continue." SP

Drone spotted near IGI Airport runway in New Delhi

The Indira Gandhi International (IGI) Airport of Delhi recently was put on high alert after an unidentified flying object was spotted at the airport. The air traffic controllers (ATCs) at the airport have been regularly spotting suspicious objects flying over the airport, according to media reports.

On October 27, ATC noticed a drone-like object flying over the runway but it has no visual proof to support its claim. Reportedly, the Indian Air Force (IAF) tried to track down the object by sending a chopper but could not find anything.

On October 28 night, Air Vistara flight from Bhubaneswar also complained of being distracted by a beam of laser light while it was landing at IGI. Pilot also claimed that the object was six nautical miles away from the flight. There were more than 100 lives at risk in that flight.

At 10:44 a.m. on October 30, a member of the IAF who sits at the ATC tower of IGI airport noticed a flying object over runway 9-27, also known as the smallest runway of Delhi airport. He reported two more objects at 10:50 a.m. and 10:55 a.m. which were flying outside the airport boundary. But this time also they did not get any evidence.

As per the reports, a meeting was conducted between the Intelligence Bureau, Central Industrial Security Force (CISF) and Bureau for Civil Aviation Security with Delhi Police so as to ensure the regular watch on such aerial threats.

Under Section 144 of CrPC it is prohibited to use laser beams and fly any object by any individual or a group in areas around the airport. SP

Health insurer Anthem hit by hackers

Health insurer Anthem confirmed earlier this year that the hackers infiltrated its computer network and gained access to personal information for tens of millions of customers and employees, including CEO Joseph Swedish.

The nation's second-largest health insurer said it was contacting customers affected by what it calls a 'very sophisticated' cyberattack. It said hackers gained access to names, birthdates, e-mail address, employment details, social security numbers, incomes and street addresses of people who are currently covered or have had coverage in the past.

The Indianapolis-based insurer said credit card information wasn't compromised, and it has yet to find evidence that medical information such as insurance claims and test results was targeted or obtained. It was still trying to determine exactly how many people were affected.

A spokeswoman said the insurer was working with federal investigators to figure out who was behind the attack. SP

PHOTOGRAPHS: Wikipedia