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"It would make immense sense if the Rafale numbers are incrementally increased to form at least five squadrons (80 aircraft) for the ease of maintenance, training and logistics."

— Air Chief Marshal FH. Major (Retd)

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Narendra Modi, Hon'ble Prime Minister of India (*message received in 2014)



SP GUIDE PUBLICATIONS

OVER **5** DECADES SINCE 1964

Maiden sea trial of Kalvari first Scorpene class submarine

Kalvari, the first of the Scorpene class submarines, built at the Mazagon Dock Ltd (MDL), Mumbai, went to sea for the first time on May 1. The submarine sailed out at about 1,000 hours under her own propulsion for the first sea trial, off the Mumbai coast and during the sortie, completed a number of preliminary tests on the propulsion system, auxiliary equipment and systems, navigation aids, communication equipment and steering gear. Various standard operating procedures were also validated for this new class of submarines. The submarine then returned to the harbour in the evening.

This important milestone was achieved by MDL after overcoming a number of challenges faced since launching of the submarine in October last year. During the next few months, the submarine will undergo a barrage of sea trials, including surface trials, diving trials, weapon trials, noise trials, etc., which would test the submarine to the extremes of its intended operat-



ing envelop. Thereafter she would be commissioned into the Indian Navy as INS Kalvari later this year. Commissioning of Kalvari will be a reaffirmation of India's capability to build submarines and a major boost for the 'Make in India' programme of the government.

In April last year, the Defence Minister had visited MDL and directed that all out effort be made to complete the project in time. Accordingly, the teams from MDL, Indian Navy and DCNS have been working round the clock. Today, with the first sea sortie of Kalvari, MDL has achieved a major project milestone.

The ongoing project for the construction of six Scorpene class submarines has DCNS of France as collaborator and includes transfer of technology (ToT) with MDL as the 'Builder'. Leveraging on the experience and the ToT of the Scorpene project, and with the enhanced and upgraded infrastructure, MDL is ready for undertaking future submarine and shipbuilding projects in order to meet the growing requirements of national security. **SP**



Cover:

Foreign Secretary Dr S. Jaishankar with Foreign Secretary of Pakistan, Aizaz Chaudhry in New Delhi April 26, 2016. The meeting between the two Foreign Secretaries happened on the sidelines of the Heart of Asia conference.

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SP GUIDE PUBLICATIONS

OVER 5 DECADES SINCE 1964

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India-Pakistan, always on the edge

Since the partition, the relationship between India and Pakistan has always remained on the edge and will continue to be so, despite efforts by 'sane' leadership on either side. Fringe elements, dominant military leadership, geopolitical considerations, etc, are going to continue to dictate the course of the relationship.

There have been many conclaves, many bilateral meetings, many dialogues between the two but none have been conclusive in ending the imbroglio. The contentious issue in the valley, cross-border terrorism, etc, are thorny issues and the two countries hold their ground. In this issue we look at the latest Foreign Secretary level talks, away from media glare, remained deadlocked. Ranjeet Kumar writes that the on-off India-Pakistan talks at various levels in recent years after the 26/11 Mumbai attacks have been like taking one step forward and then two steps backwards.

The spokesman of the Ministry of External Affairs Vikas Swarup stated that the Secretaries exchanged ideas on how to take the relationship forward. "It was not a meeting to finalise the modalities of the comprehensive bilateral dialogue. Ideas were exchanged on how to take the relationship forward including on the logical follow-up to the visit of the Pakistan Joint Investigation Team and the ongoing investigation into the attack on the Pathankot airbase. Both sides will reflect on those ideas. A relationship goes forward through such exchanges and let us remain hopeful."

Besides Pakistan, India has to contend with China which has its own agenda in the region. Trust-deficit continues on both the fronts for India. It is interesting to note that General Chang Wanquan told India's Defence Minister Manohar Parrikar during his visit to China recently: "Hope your visit improves strategic mutual trust between the two armed forces". The discussions covered bilateral ties with Parrikar pressing the Chinese military leadership for border transgressions stressing the need to resume the process of clarifying the line of actual control (LAC) and India's displeasure

at China blocking the listing of JeM chief Masood Azhar at the UN. Lt General P.C. Katoch (Retd) analyses the visit and its import on the relationship.

With such neighbours, it is but natural for India to step up its programme of modernisation of armed forces, though it has been a bit tardy. The former Air Chief Fali H. Major has welcomed the decision to speed up acquisition of the Rafale deal and has said that it would make immense sense if the Rafale numbers are incrementally increased to form at least five squadrons (80 aircraft) for the ease of maintenance, training and logistics that is required to maintain a front line state-of-the-art aircraft such as Rafale. Also, given the size and expanse of our country and the airspace that needs to be controlled, defended even during peacetime and 'dominated' in times of war/conflict, the number of aircraft do matter.

In this issue, we have analysis on the Defence Procurement Procedure; a report on the successful launch of the Indian Space Research Organisation's (ISRO) PSLV-C33 vehicle placing the satellite IRNSS-1G in orbit, a significant milestone in the 'Indian Regional Satellite System'; and information on aircraft which can be used in firefighting in the background of the raging fire in Uttarakhand, among other subjects of topical interest.

Happy reading!



Jayant Baranwal
Publisher & Editor-in-Chief

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LT GENERAL
P.C. KATOCH (RETD)

Parrikar's China visit – Beijing remains obdurate

Defence Minister Manohar Parrikar's maiden visit to China was in the backdrop of China using her veto at the UN to prevent Jaish-e-Mohammad (JeM) chief Masood Azhar being designated terrorist. The Chinese explanation that they applied "technical hold, not veto" is a sick cover, akin to China developing military bases in the Indian Ocean region (IOR) but terming them "strategic support bases". During his visit Parrikar held talks with his counterpart Defence Minister General Chang Wanquan, Vice Chairman of the Central Military Commission (CMC) General Fan Changlong and others. He also called on Premier Li Keqiang and visited the HQ of China's newly integrated western command responsible for border with India.

Parrikar announced that India attaches highest priority to its relationship with China and is committed to further develop the ties. General Chang Wanquan reciprocated by saying, "Hope your visit improves strategic mutual trust between the two armed forces". The discussions covered bilateral ties with Parrikar pressing the Chinese military leadership for: border transgressions stressing the need to resume the process of clarifying the line of actual control (LAC) and India's displeasure at China blocking the listing of JeM chief Masood Azhar at the UN. With respect to the latter, similar messages were also conveyed by the External Affairs Minister Sushma Swaraj and the National Security Advisor (NSA) Ajit Doval during their recent visits to China.

Parrikar's focus was the boundary issue and ensuring stability along the undemarcated LAC. India has been pressing China to go ahead with the process of clarifying the LAC, absence of which leads to transgressions, but China remains reluctant. Parrikar said both sides moved closer to operationalising hotlines between military commands to enable faster addressing of any incidents. China officially responded to a draft MoU put forward by India and the issue now appears close to be finally settled. Both sides are also looking at a new border meeting point in the middle sector.

Parrikar also raised the issue of Chinese infrastructure projects in the Pakistan occupied Kashmir (PoK). The Chinese responded that the projects are economic, not aimed at India from a defence or military perspective. There has been improvement in India-China military ties, reflected by Northern Army Commander visit to China in December 2015 after China had denied visa in 2010 to the then Northern Army Commander; five joint India-China counter-terrorism exercises conducted, last one in October 2015; fifth border personnel meeting point in the Ladakh sector opened in August 2015, and; China participated in the International Fleet Review hosted by India this year. However, China continues to back Pak-

istan's anti-India jihad, is stoking the fires of insurgency in India's Northeast, and People's Liberation Army (PLA) patrols continue transgressing the LAC, denying these are incursion /intrusions. China has been proposing a 'code of conduct' as adjunct to the Border Defence Cooperative Agreement (BDCA), insisting such code has been effective in the South China Sea (SCS). But looking at the aggressive provocative actions of China in SCS that have raised tensions to unprecedented levels, it is unlikely China's attitude astride the LAC will change despite any additional code.

Establishing regular communications at the strategic levels and at tactical levels along the LAC too will make little difference if there is no change in attitude of the President Xi Jinping headed CMC, with Xi recently designated Commander-in-Chief. Incidentally, India and China agreed to adhere to "peaceful negotiations" to settle the vexed border issue and reach a "fair, reasonable and mutually acceptable solution" during the annual 19th round of boundary talks between NSA Doval and his Chinese counterpart Yang Jiechi — which actually means little considering past Chinese experience. Ironically while Sino-Indian economic relations are on the upswing with enormous bilateral trade deficit ballooning in China's favour, bilateral military relations are constrained by two major factors. First, is the boundary resolution which India considers top priority but China wishes to drag. This is perhaps because China with her economic and military prowess feels it can nibble away more territory. China plundered uranium, copper and gold deposits from Tibet worth one trillion dollars in addition to exploiting water and other natural resources. She did likewise in Aksai Chin. China acquired Shaksgam Valley from Pakistan for the same reason. China knows that there is immense wealth along the Himalayas, is already mining uranium in northern Nepal, and that is why she claimed entire Arunachal Pradesh first time in 2005. The second major reason is China's unequivocal bias towards Pakistan, Gwadar being the pivot to China's one belt, one road ambition on the Indian Ocean.

Having sunk \$46 billion in the China-Pak Economic Corridor (CPEC), the People's Liberation Army (PLA) troops are already guarding the CPEC under construction in Gilgit-Baltistan, and China is raising three divisions to protect the CPEC. Their deployment in PoK-Pakistan astride the CPEC running parallel to the Indo-Pak border has serious strategic ramifications for India. India-China military relations, therefore, will remain constrained despite the outward display of bonhomie. **SP**

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

**PLA deployment
in PoK-Pakistan
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the Indo-Pak border
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India.**

India-Pakistan talks – No forward movement



Foreign Secretary Dr S. Jaishankar with Foreign Secretary of Pakistan Aizaz Chaudhry in New Delhi on April 26, 2016

[By **Ranjeet Kumar**]

The on-off India-Pakistan talks at various levels in recent years after the 26/11 Mumbai attacks have been like taking one step forward and then two steps backwards. The announcement of the latest Foreign Secretary level talks (April 26) in New Delhi was a big surprise and generated a lot of excitement but as usual the talks could not move forward and remained deadlocked.

The Indian Ministry of External Affairs (MEA) had to clarify two days later that the Foreign Secretary level talks were not part of the comprehensive bilateral dialogue. The spokesman of the MEA Vikas Swarup stated that both exchanged ideas how to take the relationship forward. "It was not a meeting to finalise the modalities of the comprehensive bilateral dialogue. Ideas were exchanged on how to take the relationship forward including on the logical follow-up to the visit of the Pakistan Joint Investigation Team and the ongoing investigation into the attack on the Pathankot airbase. Both sides will reflect on those ideas. A relationship goes forward through such exchanges and let us remain hopeful."

The Pakistani Foreign Secretary was told in clear terms that unless the Pakistani authorities show some progress and cooperate with the Indian authorities in the investigation of the Pathankot terror attack, no further dates for the bilateral dialogue can be set. This was

in response to the Pakistani request for early revival of the comprehensive bilateral dialogue. In fact Pathankot has been added to the list of terror attacks for which India is seeking answers and justice to the dead civilians and soldiers. Earlier, the Indian side was harping on the eight-year-old 26/11 Mumbai attacks, the investigations of which have moved nowhere. The longer the list of terror attacks, the talks process gets more complicated as the Indian interlocutors cannot convince its people that talks can go on in spite of jihadi elements based in Pakistan continuing with anti-India operations with impunity.

Whenever a meaningful step is taken by both sides to promote dialogue, some elements inimical to the cordial relations between India and Pakistan take certain violent steps that derail the talks process. The Foreign Secretaries of India and Pakistan were about to meet on January 15 this year, but a fortnight prior jihadi elements attacked the Pathankot airbase forcing the Indian Government to cancel the talks. All evidences point towards the involvement of Pakistani jihadi group Jaish-e-Mohammad which has been officially accepted by the Pakistani establishment also, but not ready to acknowledge the direct role of its domestically nurtured terror groups, who in fact are patronised by the Pakistani army.

It is often said that the destiny of Pakistan is guided by three As — Allah, Army and America. Allah and the Army always prevail upon the civilian leadership and the so-called democratically elected leaders of Pakistan always kowtow to the whims and fancies of the army.



External Affairs Minister Sushma Swaraj with Prime Minister Nawaz Sharif of Pakistan in Islamabad in December 2015

But public pressure in Pakistan forces the army leaders to accede to the demands of the civilian leadership. However, the civilian leaders are not able to independently pursue the dialogue and always remain under the shadow of the army. The April 26 talks were also guided by the army commanders in Rawalpindi, hence from the very beginning the Pakistani Foreign Secretary Aizaz Ahmed Chaudhry adopted a very aggressive stance which naturally resulted in tough response from the Indian Foreign Secretary S. Jaishankar.

India-Pakistan talks at the senior official level or at the ministerial level always attracts intense media glare. Hence to avoid media interference in the talks this time every effort was successfully made to keep under wraps the Foreign Secretary level talks away from the media limelight, held on April 26 in New Delhi, to prevent it from going down the hill, but the intransigent attitude adopted by the Pakistani delegation did not allow the talks to move an inch. The talks were held under the guise of the Heart of Asia talks for which the Pakistani Foreign Secretary was scheduled to visit New Delhi. In fact the occasion of the conference was found as a good excuse to tell the two Foreign Secretaries to meet which would not attract much media comment on the possibilities of the success or failure of the talks. The talks were marred by accusations and counter accusations and it appeared that the Pakistani delegation arrived in New Delhi with an aggressive intent. Naturally, the Indian side retorted to each of the allegations relating to alleged Indian interference in Pakistan's restive region of Baluchistan and also in Karachi which has been witnessing sectarian violence since many decades. Naturally the Pakistani media has aptly characterised the India-Pak Secretary level talks as failure which could not produce any significant result. Though the two Foreign Secretaries were able to break the ice but the atmosphere remained frosty and the talks failed to make any forward movement.

Actually, the Pakistani media described the talks as failure and they reported that the "Foreign Secretary level talks between India and Pakistan 'failed' to break the stalemate and did not produce any significant measure of forward movement as the two sides only raised issues important to them without conceding ground to the other." The Pakistani media also said that Pakistan conveyed "it's serious concerns to India over its spy agency's involvement in subversive activi-

ties in Baluchistan and Karachi as talks between the Foreign Secretaries of the two arch rivals in New Delhi failed to break the stalemate in the bilateral dialogues."

The Dawn reported that the two Foreign Secretaries raised their respective preferred topics without apparently conceding much to the other, "Pakistan's Foreign Secretary Aizaz Ahmed Chaudhry, predictably as happens in inclement diplomatic weather, raised the issues of Jammu and Kashmir and the capture of an Indian intelligence officer in Baluchistan." *The Nation* reported that the top diplomats of India and Pakistan held talks after a hiatus of several months and both raised issues of their own concern and made demands from the other side on contentious issues.

It further said that though both sides called it a constructive session where they discussed "all issues", the low-key meeting did not produce any significant measure of forward movement. The Pakistani Urdu newspapers and electronic media also emphasised that the Research and Analysis Wing's (RAW) alleged involvement was the big issue in the talks. Other newspapers also highlighted the spy story.

But Jaishankar firmly rebutted the allegations of India's involvement in Baluchistan and other areas asserting that how can a country send its spy to other country with a passport without visa. The Indian side raised the demands of early consular access to Indian citizen Kulbhushan Jadhav but the Pakistani Secretary failed to promise such meeting. This was the level of mistrust between the two sides and the latest talks have shown that the two sides were talking at each other and not to each other. The Indian side took solace in the fact that "both sides have described the meeting as frank but constructive."

According to Swarup: "The decision to commence the comprehensive bilateral dialogue between India and Pakistan was taken during External Affairs Minister Sushma Swaraj's visit to Islamabad in December last where it was also agreed that the two Foreign Secretaries would meet to work out the modalities and schedule of the meetings under the dialogue, since then the two Foreign Secretaries have been in touch. What happened on April 26 was a meeting between the two Foreign Secretaries on the sidelines of the Heart of Asia conference. It was not a meeting to finalise the CBD." This characterises the state of bilateral relations between India and Pakistan for now. **SP**



AIR MARSHAL
B.K. PANDEY (RETD)

Recipe for success

Unless the Indian aerospace and defence industry has access to the global market, the prospects of success of 'Make in India' campaign is likely to remain plagued by uncertainty

Make in India, the latest mantra for the Indian defence industry, was launched personally by Prime Minister Narendra Modi on September 25, 2014, four months after the NDA Government came to power. This was the first and important step in the fulfilment of the promises made in this regard by the Bharatiya Janata Party (BJP) during the election campaign. The broader aim of the 'Make in India' campaign is to kick-start India's overly lax manufacturing segment especially in the Indian aerospace and defence industry and thereby to rejuvenate the confidence of investors.

India has one of the largest armed forces in the world and around 70 per cent of the requirement of military hardware is met with through acquisition from abroad; the remaining 30 per cent being produced by the Indian aerospace and defence industry in the public sector which dominates the scene. Import of defence equipment consumes over 40 per cent of the annual budgetary allocation for the Ministry of Defence (MoD). As a multibillion-dollar market for military hardware, India is an extremely attractive market for the global aerospace and defence majors. The new thrust for 'Make in India' is expected to open up fresh avenues for manufacturing in this sector.

Over the years, India has acquired the dubious distinction of being the largest importer of military hardware in the world, a status that Prime Minister Modi is determined to change. For a nation aspiring to be a regional power, it would be necessary to develop an indigenous capability to manufacture most if not all the equipment required by the three services as also the paramilitary forces. Besides, it is also of importance that the indigenous military industrial complex must be internationally competitive.

Quite understandably, there will be impediments in the 'Make in India' campaign of the Modi-led NDA Government; but steps have been underway since the beginning of the last decade to introduce the necessary reforms. And now there is fresh impetus in this direction. Participation up to 100 per cent by the Indian private sector in the defence industry was permitted for the first time in the year 2001.

Thereafter, the MoD introduced the Defence Procurement Procedure (DPP) in 2002 to define and regulate the process of procurement of military hardware from abroad and restricted foreign direct investment (FDI) to 26 per cent. This, however, was later revised to 49 per cent. The DPP has been refined periodically with the aim of making it more business-friendly and the latest version, DPP 2016 that was released during the Defexpo 2016 held in March this year in Goa has generated a fresh surge of hope.

There are also ongoing efforts by the government to make radical changes in the archaic rules and regulations for the defence industry as also the laws pertaining to imports, exports and taxation to make it easier for entrepreneurs to do business in India. The proposal to raise the cap on FDI beyond 49 per cent possibly to 74 per cent or even up to 100 per cent is currently under active consideration at the MoD. This has been a major issue with foreign investors as with FDI at 49 per cent, they have no control over their investments. For obvious reasons, the MoD is hesitant to allow control to pass into the hands of investors from abroad. But the related issue is that no foreign original equipment manufacturer will transfer sensitive and modern technology unless he can exercise control over his investments in India. Without transfer of technology, the indigenous industry may not be able to grow beyond its present level of capability.

A major limiting factor for the Indian aerospace and defence industry is the low volume of domestic demand which does not provide for economy of scale, a fundamental consideration for any industrial venture. Besides, as military platforms are subject to periodic replacement with new generation equipment, infusion of fresh investments in the infrastructure would be required with matching frequency. This issue could be a major impediment to the 'Make in India' campaign. The requirement therefore would be to find ways scale up demand to obtain maximum return on investment and make the venture profitable to survive. Therefore, unless the Indian aerospace and defence industry has access to the global market to enhance the volume of demand substantially, the prospects of success of the 'Make in India' campaign is likely to remain plagued by uncertainty. **SP**





BHASKAR KANUNGO



C.S. KRISHNADEV

If we have to lower the cost of defence procurement while ensuring that competitiveness of our weapon systems is cutting edge, our procurement process has to go many levels below than merely buying latest weapons on the block with hope of subsequent piecemeal indigenisation

DPP 2016 – Policy aiming to build defence industrial base in India

[By **Bhaskar Kanungo** and **C.S. Krishnadev**]

In December 1941, when Japanese aircraft and naval ships launched a surprise morning attack on the American naval base at Pearl Harbor, Hawaii, the US economy was still battling the aftermath of 1929 economic depression. In less than 18 months, US economy, launched forth an unprecedented manufacturing machine which produced an endless array of tanks, destroyers, aircrafts and rifles which saw the end of Axis powers and the European dominated world order. This unleashing of enterprise not only ended great economic depression, but paved the way for rise of the United States as a superpower. It must be noted that the men and the entities which led this change were automobile and auto ancillary companies. The US automotive industry had internalised Henry Ford's assembly line manufacturing and could now apply this to making of tanks, jeeps and aircraft. It rapidly channelised precious commodities like steel and expertise such as welding from auto manufacturing to defence production. Subsequently, some of the biggest behemoths of defence manufacturing in world today from Boeing, Lockheed to General Dynamics leveraged this base to emerge as the biggest weapon system suppliers of the world.

Although it's naive to suggest that India will have to initiate a war of a proportion of World War II to revitalise its defence manufacturing sector, there are important lessons to be drawn from studying the origins of defence manufacturing in the United States. The Defence Procurement Procedure (DPP) 2016 is a bold attempt in leveraging India's public and private sector capacities towards creating a robust defence manufacturing ecosystem.

The much awaited DPP 2016 was announced by Defence Minister on March 28, 2016, during inaugural of 9th Defexpo 2016. DPP 2016 as expected has focused towards self-reliance with the same being emphasised in the preamble. This is most important as in past we have witnessed despite a well thought out Defence Production Policy (DPrP 2011) in force, no official has ever bothered to refer it while making capital procurement. Indian industry bodies in their representation to the ministry have always emphasised on the DPrP 2011 which clearly spelt out the need of self-reliance and greater indigenisation. The same was reiterated to the Experts Committee for-

mulated for the review and revision of DPP 2013.

Indian strategic community over the last decade has time and again deliberated on the need of strong defence industrial base in country. This was further necessitated with the successful conduct of Operation Shakti (Pokhran II) as a consequence of which India faced global sanctions and technology denials. It was the Defence Research and Development Organisation (DRDO) and combination of defence public sector undertakings (DPSUs), Ordnance Factories Board (OFB's) and handful of private sector companies who took the challenge of indigenous development of technology and products to meet the strategic requirements and safeguarding of the Indian frontiers. The Ministry of Defence (MoD) while formulating DPP 2016 has kept the vulnerability of 'over-dependence and related risks' while formulating the DPP 2016. The new policy, in order to give filip to defence production, has thus preferred to first procure indigenously designed and developed products from the Indian entities which have the product manufacturing capacity. This preferred category is called 'Buy (Indian-IDDM)' where IDDM stands for Indigenously Designed, Developed and Manufactured. Under this new and first preference category, Indian vendor needs to ensure products that have been indigenously designed, developed and manufactured has a minimum of 40 per cent indigenous content (IC) on cost basis of the total contract value; OR, products having 60 per cent IC on cost basis of the total contract value, which may not have been designed and developed indigenously. Apart from overall IC as detailed above, the same percentage of IC will also be required in (a) Basic Cost of Equipment; (b) Cost of Manufacturers' Recommended List of Spares (MRLS); and (c) Cost of Special Maintenance Tools (SMT) and Special Test Equipment (STE), taken together at all stages, including FET stage.

It shows the commitment of the government to support those companies which are serious in R&D-led innovation aimed at indigenous development of products, rather than those companies which simply buy a substantial portion of foreign technology or products with development of some less technologically complex subsystems or parts as a lateral value addition. This particular category will enthruse companies to invest in R&D, innovate, develop and harness skills and develop niche products for meeting domestic requirements. With this Indian manufacturing will not just march towards self-reliance, sav-



Omni-role capable Dassault Rafale

ing precious foreign exchange but will enable spinning of new lines of hitherto unexplored product branches which would be useful for defence and commercial usage. With the stabilisation and maturity of products developed under IDDM category, we can eye defence export markets especially of Asian, African and South American economies.

DPP 2016 does mention a competency mapping of private industry following the request for information (RFI), and the relevant SHQs to guide various vendors to commercially off the shelf components (COTS). The problem is this competency mapping would provide a very incomplete picture of India's true manufacturing potential. It is unlikely MoD will have the bandwidth to truly gauge the expertise of smaller manufacturing ancillaries and manner in which it would dovetail into a larger weapon system. MoD needs to realise that a rigid top-down manufacturing as has been followed till date severely limits the participation of large spectrum of Indian industries, with a bulk of defence contracting being cornered by bigger private sector players. In order to create a resilient vendor base, and spur R&D in defence manufacturing it is imperative that smaller players, even technology startups which are in a position to contribute to systems such as night vision, optics, imagery, and personnel protection & tracking, sensor packages, etc., which are critical for ensuring battlefield competency in a complex theatre be integrated into the manufacturing process. It is incumbent on the MoD to realise that the only way to encourage a wider private sector R&D participation is to ensure identification and dissemination of technologies which are necessarily dual use in nature. The Predator drone, which has given the United States the first truly global strike capability, was not developed by any of the big defence players such as Boeing or Lockheed Martin. It was the work of Abraham Karem on a seed budget of \$5 million and time frame of only three months¹. The modern Predator drone which has revolutionised the battle space bringing in unprecedented intelligence surveillance and reconnaissance (ISR) and strike capabilities is powered by an ancient 110 hp four-stroke petrol engine more likely to be found in a golf cart than cutting-edge military hardware. Its long loiter times and low fuel consumption proved to be a critical battlefield advantage.

We must also realise in the global era we need to utilise our stra-

tegic equations with various countries for technological collaborations and partnership for the development of products tailor made for needs of the Indian warfighter. This has to be a combination of indigenously designed and developed products adequately complemented by global solutions. With this approach of partnership, Indian industry can very well become part of global supply chain, which itself will ensure that ingeniously developed defence and aerospace products get recognition in global defence market.

The government has realised the importance of involvement of industry as partner in the planning process. Without the closer synergy between the industry and users, the gaps between the user requirement and the delivery capability of industry will always remain a challenge and there will always be enough reasons for lack of satisfaction of both sides. DPP 2016 has mentioned that industry may be involved at the feasibility stage itself (draft PSQR may be shared) by HQ IDS/SHQs. Extensive interactions with industry will augment Indian industry's capability to design, availability of technology/Indian product will not just help users but also help Indian industry to understand the thought process, operational requirement thus leading to investment in required technology and future research for innovations. The sources while drafting of SQR should also include careful understanding of those battlefield scenarios in the world which mirror Indian tactical situations. The analysis and qualification requirement shouldn't be limited to a few defence publications which might bias the SHQ/HQ IDS to offerings of a few defence manufacturing incumbents.

Closer Industry Involvement is a sign of mutual trust and confidence on capacity and capability to deliver. The other major welcome in DPP 2016 which will help Indian defence industry is the relaxation for transfer of technology (ToT) to private entity under 'Buy (Global)' cases. Single vendor selection based on ab-initio development/MoU with foreign partner extended to private industry also permitted. All these measures will bring level playing between the public and private sector.

Though, DPP 2016 like previous publications is overly enthusiastic about ToT, evidence suggests that such a transfer which of necessity also includes intellectual property rights and patents



MQ-1 Predator unmanned aerial vehicle

rarely happens. Even more so, defence technology transfer in many cases violates laws such as MTCR. If we examine the history, of previous efforts at ToT by Indian Government, the foreign entities have only come as far as allowing licensed production of equipment. Even the much publicised purchase of 36 Rafale jets does not include transfer of critical technologies such as AESA². India needs to understand that being a mere market for defence equipment is not a strong enough incentive for major defence manufacturers of the world to agree to a technology transfer which they have developed and patented after expending billions in both man-hours and dollars.

The only real path for a realisable ToT is for India to reach out to smaller players including hardware startups in United States and Israel which are eagerly looking for seed funding and a supportive ecosystem. It is not beyond imagination that India could have provided an office space and \$5 million for leading systems (Abraham Karem's firm) and taken the lead ahead in UAV technology. Pitching Pentagon so late in the day for 40 Predator drones is going to be an enormously complicated not to mention an immensely expensive exercise³. The only way to explore and exploit possibilities which are at a nascent stage is to move away from a top-down thinking as arising from a rigid interpretation of DPP. While extant procedures of DPP such as defence competency mapping and SQR might serve reasonably well when procuring a fighter jet or an aircraft carrier, it falls woefully short when it comes to critical technologies such as stealth drones, bullet proof vests, perimeter surveillance and automatic firearms. The reason being that cutting-edge innovation on these technologies are often done by small startups which often won't even advertise in defence publications and periodicals. They mostly end up selling their solutions to a larger company which has better mass manufacturing and marketing abilities. If we have to lower the cost of defence procurement while ensuring that competitiveness of our weapon systems is cutting edge, our procurement process has to go many levels below than merely buying latest weapons on the block with hope of subsequent piecemeal indigenisation. The danger with the latter approach is that 'Make in India' may just devolve into an 'Assemble-in-India' cutting out many high-value/high-wage jobs from India.

The detractors and larger defence manufacturing companies often love to quote the iPhone, stating that a significant share of its subsystems are manufactured in China and South Korea. While factually true, what they often forget is that iPhone is at the end of day an American product with much of the patents and intellectual property rights held by a company in California whose name has almost become a mantra among design gurus. Most importantly the value-addition of iPhone is primarily not so much because of the subsystems involved but its unique tailor-made operating system and a software ecosystem which is designed to squeeze every ounce of power from underlying hardware while maintaining exceptionally high levels of device reliability.

Similarly, it is a foregone conclusion that indigenisation of defence equipment will have to depend on foreign subsystems, but it's one thing to import critical semiconductors to give your hardware a competitive edge and completely another to import entire sub-assemblies of knocked down products, assemble in India, tweak the output requirements and have our local entities name stamped on it. It is the latter which we need to discourage. The DPP 2016, IDDM 40/60 per cent indigenisation requirements rightfully capture this spirit, but it remains to be seen how it is executed. **SP**

Bhaskar Kanungo is working as Deputy Director – Defence and Aerospace, FICCI. The views expressed in this article are his personal and not necessarily the reflection of official FICCI position.

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References

¹<http://www.economist.com/news/technology-quarterly/21567205-abe-karem-created-robotic-plane-transformed-way-modern-warfare>

²<http://www.financialexpress.com/article/economy/talks-for-36-rafale-jets-far-from-over/236378/>

³<http://in.reuters.com/article/india-usa-predator-drones-china-pakistan-idINKCN0X51BW>

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 **COGES**



Prime Minister Modi with the LIGO team

The LIGO project

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

Amidst the commotion of the Nuclear Security Summit 2016 held in Washington DC, signing of the Indo-US MoU on the setting up of Laser Interferometer Gravitational-Wave Observatory (LIGO) in India largely went unnoticed. The LIGO project recently proved the existence of gravitational waves envisaged by Albert Einstein a century ago. Interestingly, Einstein had gone on record to say, "We owe a lot to the Indians, who taught us how to count, without which no worthwhile scientific discovery could have been made."

Now it is India's turn to join research on gravitational waves that were first visualised by Einstein. This will be the third LIGO observatory, and the first one outside the US. The LIGO, funded by America's National Science Foundation (NSF), is the largest and most ambitious project ever funded by the NSF, collaborating more than 900 scientists worldwide as well as 44,000 active Einstein@Home users. The LIGO project is run with the collaboration of 90 universities and research institutions. 30 people of Indian origin are part of the LIGO project. The two existing LIGO observatories are located at Hanford, Washington, and Livingston, Louisiana, and are operated by Caltech and MIT. While India will now join the league of countries supporting research on gravitational waves with setting up of this LIGO observatory, US, UK, Italy, Germany and Japan have ongoing research in the area.

The proposed observatory in India was discussed between India and US in June 2012. The basis of the LIGO-India project entailed transfer of one of LIGO's detectors from US to India, which would have affected work and scheduling on the Advanced LIGO upgrades already underway. In August 2012, US approved the LIGO Laboratory's request to modify the scope of Advanced LIGO by not installing the Hanford "H2" interferometer, and to prepare it instead for storage in anticipation of sending it to LIGO-India. The first direct detection of gravitational waves was announced by the scientists on February 11, 2016, opening a new window onto the cosmos. Immediately after this landmark discovery, Prime Minister Narendra Modi announced on February 17, 2016, that the Cabinet had granted 'in-principle' approval to the ₹1,200-crore LIGO-India mega science proposal.

Construction and completion of the third LIGO interferometer is to be taken up shortly, and the observatory is expected to be functional by 2023, which will significantly improve the ability of scientists to pinpoint the sources of gravitational waves and analyse the signals. Gravitational waves are ripples in the fabric of space and time produced by dramatic events in the universe, such as merging black holes, and predicted as a consequence of Albert Einstein's 1915 general theory of relativity carry information about their origins and about the nature of gravity that cannot otherwise be obtained.

LIGO Director Dr France A. Cordov has said that with the additional gravitational wave detector, located in India, LIGO and its hundreds of associated scientists worldwide are positioned to take this nascent field of gravitational wave science to the next level, adding, that the third detector would be able to 'triangulate' the source of gravitational waves and thus make other, more detailed observations.

The Indian Cabinet while approving LIGO-India had said that the project "will also bring considerable opportunities in cutting-edge technology for the Indian industry" which will be responsible

for the construction of the new observatory's four-kilometre-long beam tubes, and the project will motivate Indian students and young scientists to explore newer frontiers of knowledge; giving further impetus to scientific research in the country. The beams monitor the distance between mirrors precisely positioned at the ends of the arms. According to Einstein's theory, the distance between the mirrors will change by an infinitesimal amount when a gravitational wave passes by the detector. A change in the lengths of the arms smaller than one-ten-thousandth the diameter of a proton (10-19 metre) can be detected. The degree of precision achieved by Advanced LIGO is analogous to being able to measure the distance between our solar system and the sun's nearest neighbour Alpha Centauri (about 4.4 light years away) accurately to within a few microns, a tiny fraction of the diameter of a human hair.

Prime Minister Modi had met LIGO scientists in Washington DC two days after he met scientists from the Institute of Plasma Research in New Delhi, who are also working on the LIGO project. Joining the LIGO project undoubtedly is an excellent scientific initiative since it will benefit multiple applications with far-reaching consequences. **SP**

Construction and completion of the third LIGO interferometer is to be taken up shortly, and the observatory is expected to be functional by 2023, which will significantly improve the ability of scientists to pinpoint the sources of gravitational waves and analyse the signals.



LT GENERAL
P.C. KATOCH (RETD)

Maritime India Summit and Sagar Mala – Strategic moves

The first ever Maritime India Summit 2016 held in Mumbai on April 14-16, 2016, was inaugurated by Prime Minister Narendra Modi. Focused at developing the country's, it aimed at attracting potential investors to the vast opportunities offered in India's maritime sector. Some 40 countries in addition to India with Republic of Korea as the partner country participated in the Summit. The project named 'Sagar Mala', the summit had 13 thematic sessions to include: Port Led Development; Ship Building, Ship Repair and Ship Breaking; Skill Development through Maritime Education & Training; Inland Water Transportation and Coastal Shipping; Hinterland Connectivity & Multi-Modal Logistics; Opportunities in International Shipping & Maritime Financing; Opportunities in Maritime States; Cruise Shipping & Lighthouse Tourism; Island Development & Aquatic Resources; Maritime Security and Counter Piracy.

Sagar Mala project is a strategic and customer-oriented initiative of the Modi Government to modernise India's ports so that port-led development can be augmented and coastlines can be developed to contribute to India's growth. Presently, ports contribute just 1 per cent of our GDP vis-à-vis roads 6 per cent and railways 9 per cent. The potential of our over 7,000-km coastline has never been optimised for India's economic growth. Ideally India should do more than 90 per cent of import-export by sea. The three pillars of Sagar Mala are: one, modernisation of port's infrastructure; two, proactive policy utilisation pertaining to ports and rendering institutional framework to the stakeholders, and; three, developing sustainable and efficient transport infrastructure so that all the ports are interconnected with the mainstream economy and best could be derived out of their availability. Under Sagar Mala, redevelopment of new and existing ports will be undertaken; upgrading them enough to handle extensive use of equipments and IT, and ushering improved monitoring and high-tech infrastructure for day to day business activity.

The Jawaharlal Nehru Port Trust (also called Nhava Sheva), the largest container port in India and also terminal of the Western Dedicated Freight Corridor proposed by the Indian Railways, has been allotted ₹4,000-crore for development as an Special Economic Zone (SEZ). Sagar Mala is to adopt an integrated development approach for which 1,200 islands, both big and small, have been identified that would have some 189 lighthouses for vigilance and tracking. Overall, the government plans to spend some ₹70,000 crore on 12 ports in Sagar Mala.

Prime Minister Modi while inaugurating Maritime India Summit 2016 drew attention to the fact that this was the first time a global event of such magnitude was being organised by India. He said that oceans being 70 per cent of earth's surface, maritime transport can be the most

extensive and most eco-friendly mode of transport. Also, maritime security, freedom of navigation and safety and security of sea lanes is equally important. While highlighting economic and investment opportunities India's coastlines offers, he also spoke of how joint efforts of maritime nations had resulted in elimination of sea piracy. He said that India has embarked on development of national waterways, and while India is the fastest growing major economy today, the International Monetary Fund (IMF) and the World Bank have indicated better future prospects.

India is taking aggressive steps to ensure that our process of growth is both fast as well as inclusive. Calling for global business community to partner India in the Sagar Mala project, Modi said that not only does the vast coastline offer huge investment opportunity, India's maritime importance includes its strategic location on all major shipping highways, in addition to an expansive and productive hinterland, through which flow a network of rivers. India's maritime agenda is to complement this ambitious infrastructure plan for the hinterland which is running simultaneously.

Significantly, Prime Minister Modi also pointed out that with oceans contributing 90 per cent of living space on the planet, our lifestyle, transport systems and trading behaviour should not spoil the ecology of the oceans, and that challenges of climate change have shown that even offshore human behaviour can change the ecology of glaciers and oceans. It is ironic that while Prime Minister Modi drew attention to these important global issues, reports have emerged that China is engaged in levelling some 700 mountains to make space for cities despite geologists warning this could lead to ecological disaster. China is also building dams and diverting rivers in Tibet without any thought to consequences. There is no denying that the Maritime India Summit 2016 and

Sagar Mala are game changers for India at the strategic level spanning both economic and military arenas. Their significance should also be viewed in the backdrop of Chinese plans to develop some 18 military bases in the Indian Ocean region under cover name 'Strategic Support Bases', which include deep water ports like in Gwadar, Hambantota and Colombo facilitating SSBN operations.

Significantly, a Chinese-led consortium has agreed to buy one per cent of Australia's Kidman and Co (Australia's largest farming estate – area larger than Ireland) costing \$289 million. The Modi Government would do well to also focus on India's largest natural aircraft carrier (the Andaman & Nicobar group of islands), whose ports and coastline too must be developed with the centre of gravity of future conflict veering towards the Indian Ocean. **SP**

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



Prime Minister Narendra Modi
addressing at the Maritime India Summit

Defence Minister assures government's commitment to the modernisation and development plans of the Indian Navy

"Indian Navy's role is not only vital for national security, but also for national prosperity and development." — Admiral R.K. Dhowan, Chief of the Naval Staff

[By Rear Admiral Sushil Ramsay (Retd)]

The Naval Commanders' Conference, an annual event to review the strategic and doctrinal aspects of the operational effectiveness and readiness of the Indian Navy, is held in two parts. The first edition of the Naval Commanders' Conference 2016 was held at New Delhi from April 21 to 23, 2016.

The inaugural session of the Commanders' Conference was presided over by Raksha Mantri Manohar Parrikar on April 21, 2016. While addressing the Naval Commanders and the top leadership of Indian Navy, Raksha Mantri complimented all personnel of the Indian Navy for ensuring the maritime security of the country through a high tempo of operations. He especially commended the Navy for the outstanding conduct of Combined Commanders' Conference onboard INS Vikramaditya off Kochi during December 2015 and the successful conduct of the International Fleet Review (IFR) at Visakhapatnam in February 2016. He also appreciated the humanitarian assistance and disaster relief efforts of the Indian Navy in the aftermath of the floods in Chennai as well as the recent fire tragedy at Puttingal temple near Kollam in Kerala. He assured the Commanders of the government's commitment to the modernisation and development plans of the Indian Navy.

The rest of the sessions were presided over by Admiral R.K. Dhowan, Chief of the Naval Staff (CNS). The CNS addressed the Navy's top leadership on myriad issues, ranging from enhancing the operational readiness of the Commands, infrastructure development, human resource management, coastal security, cyber security and foreign cooperation initiatives.

The CNS reiterated the core thrust areas and exhorted the importance of the C3I model — i.e. commitment, compassion, credibility and integrity — to keep focus on defined goals and steer the Navy on the correct track, which he had stressed on taking over as the CNS. He was very satisfied with the progress made over the past two years and complimented the rank and file of the Indian Navy for successfully overcoming several challenges and navigating steadily through the way points which were set.

Emphasising that combat readiness of the fleet and other operational formations is of prime importance, he reiterated that focused efforts, as hitherto, are required at all levels to ensure sustained growth of the Navy into a formidable multidimensional force. CNS

complimented all ranks of the Navy in maintaining a high tempo of operations during the last six months including the very successful IFR held at Visakhapatnam in February 2016, apart from a number of other notable operational activities such as the first Combined Commanders' Conference on board INS Vikramaditya in December 2015.

Among the focus areas discussed during the Conference were aspects pertaining to training, skill development and welfare of retiring personnel who constitute a vital resource for the nation. He also reviewed the progress of housing infrastructure projects for naval personnel. The CNS reminded that "our men and women are our greatest assets and their morale and well-being should always remain the primary concern." He also highlighted the grant of permanent commission to women officers as a major milestone in the Indian Navy's history.

The indigenisation programme of the Navy was discussed and the CNS stressed that indigenisation of platforms, weapons, sensors and equipment, through DRDO, public and private sectors as also through in-house efforts, should remain an area of focus. He highlighted the successful conduct of the recently held Indian Navy-FICCI joint seminar on 'The Make in India Paradigm — Roadmap for a Future-Ready Naval Force' where a very healthy and enthusiastic participation from the various stakeholders and Indian industry was witnessed.

During the course of the conference, the progress of airfield infrastructure, security of Naval Air Stations, dockyards and naval establishments was reviewed. The CNS also reviewed the improvements being made to the logistics delivery chain and the implementation of e-procurement in the Indian Navy. He emphasised the need for constant review and refinement of Indian Navy's logistics support structures to ensure that its combat units and formations receive quality logistics support while maintaining a high operational tempo.

In his closing address the CNS complimented all personnel for their professionalism and patriotism, and exhorted them to prepare the Indian Navy to meet the future maritime security challenges before the country. "We must continue to pull on the oars together, to propel the Navy forward, and contribute to a strong and prosperous maritime nation," he stated. He expressed confidence that the Navy would continue to grow from strength to strength in the coming years and emphasised that operational effectiveness and readiness should be the touchstone of all the efforts. He concluded by stating that the Navy's role is not only vital for national security, but also for national prosperity and development. **SP**



Defence Minister Manohar Parrikar interacting with the media on the opening day of the Naval Commanders' Conference in New Delhi

Arjan Singh: An iconic personality

The Panagarh airbase will be known as 'Air Force Station Arjan Singh', a tribute to a great hero

[By **R. Chandrakanth**]

On April 15, Marshal of the Indian Air Force (IAF) Arjan Singh, DFC, turned 97 and not just the IAF but the country saluted the iconic personality. Befitting the celebrations, the Chief of Air Staff Arup Raha announced that the Panagarh airbase will be known as 'Air Force Station Arjan Singh', an honour unmatched. At the celebrations, a number of dignitaries were present including the former Prime Minister Dr Manmohan Singh and the three Service Chiefs among others.

Arjan Singh is the only officer of the IAF to be promoted to five-star rank equal to a Field Marshal to which he was promoted in 2002. He was born in Lyallpur (now Faisalabad, Pakistan). His father was Risaldar Darbara Singh of the Hodson's Horse who had served in Gallipoli during World War I and was wounded in Burma during World War II.

The Marshal of the Air Force was the first Indian Air Chief to lead a young IAF into war in 1965. He was hardly 44 years of age when entrusted with the responsibility of leading the IAF.

After education at Montgomery in Pakistan, he went to RAF Cranwell at the age of 19 for the Empire Pilot training course. His first assignment was to fly Westland Wapiti biplanes in the North-Western Frontier Province as a member of the No. 1 RIAF Squadron. After a brief stint with the newly formed No. 2 RIAF Squadron where he flew against the tribal forces, he later moved back to No. 1 Sqn as a Flying Officer to fly the Hawker Hurricane. He was promoted to the rank of Squadron Leader in 1944. He led the Squadron against the Japanese during the Arakan campaign, flying close air support missions during the crucial Imphal campaign and later assisting the advance of the Allied Forces to Rangoon. For his role in leading the Squadron in combat, he was awarded the Distinguished Flying Cross (DFC) in 1944. On August 15, 1947, he achieved the unique honour of leading a fly-past of over a hundred IAF aircraft in Delhi, over the Red Fort.



On promotion as Wing Commander, he attended the Royal Staff College at UK. Immediately after Indian independence, he commanded Ambala as Group Captain. In 1949, he was promoted as Air Commodore and took over as Air Officer Commanding (AOC) of an operational command, which later came to be known as Western Air Command. Arjan Singh had the distinction of having the longest tenure as the AOC of an Operational base, initially from 1949-52 and then again from 1957-61. On promotion as Air Vice Marshal he was appointed as the AOC-in-C of an Operational Command. Towards the end of the 1962 war, he was appointed as the Deputy Chief of the Air Staff and he became the Vice Chief of the Air Staff in 1963. He was the overall commander of the joint air training exercise 'Shiksha' held between the IAF, RAF and RAAF.

On August 1, 1964, as Air Marshal he took reins of the IAF, at a time when it was still rebuilding itself and was gearing up to meet new challenges. He was the first Air Chief to keep his flying currency till his CAS rank. Having flown over 60 different types of aircraft from pre-World War II era biplanes to the more contemporary, Gnats and Vampires, he has also flown in transport aircraft like the Super Constellation.

In 1965, when Pakistan launched its Operation Grand Slam, with an armoured thrust targeted at the vital town of Akhnur, he led the war and inspired the IAF to victory. The then Defence Minister Y.B. Chavan wrote: "Air Marshal Arjan Singh is a jewel of a person, quiet efficient and firm; unexcitable but a very able leader."

He remained a flyer till he retired in August 1969, thereupon accepting Ambassadorship to Switzerland. He was Lieutenant Governor of Delhi from 1989 to 1990. He is a Padma Vibhushan awardee.

He has maintained high principles throughout his life and they include: one should be thorough in his profession; one should complete the job at hand to the satisfaction of everyone; one must have implicit faith in his subordinates; and one's efforts should be honest and sincere. He feels that if one adheres to these four principles, one can never go wrong. **SP**



AIR CHIEF MARSHAL
F.H. MAJOR (RETD)



A gust of wind!

The gust of wind (Rafale) is going to kick-start the exercise to augment the depleting squadron strength of the Indian Air Force soon

It would make immense sense if the Rafale numbers are incrementally increased to form at least five squadrons (80 aircraft) for the ease of maintenance, training and logistics

PHOTOGRAPH: Dassault Aviation

The literal translation of Rafale in French is 'a gust of wind' – and it seems that this gust of wind is going to kick-start the exercise to augment the depleting squadron strength of the Indian Air Force (IAF) soon, albeit in a small way and in lesser numbers and not as the 'Mother of all Deals' — as it was purported to be! But the induction of even 36 Rafale is welcome – the much needed 'wind' beneath the IAF's 'wings'!

While it is a fact that no air force in the world can have a combat fleet consisting of only the most modern and cutting-edge combat platforms, a healthy technology mix of low technology/medium technology/fourth and fifth-generation technology platforms (20%:40%:40%) is an accepted ratio to project airpower credibly and potently against your likely adversaries. Every single air force in the world is always in some form of modernisation or the other given the obsolescence/ageing of equipment, changing threat/conflict scenarios and rapid advancement of technology – it is only the costs, scope and time frames that vary. IAF is no different from any other, and is going through the many nuances and complexities that accompany such transformations!

The only peculiar difference the IAF faces is that besides the ongoing modernisation, it's combat fleet is depleting at an alarming rate. A lot has been written and debated as to why this is happening and I will not get into it, but the key issue now is to aug-

ment our squadron strength in the quickest time frame with a healthy mix of combat platforms in the ratio suggested above, or close to it. The crucial issue that needs to be kept in mind is that this mix must be of only four or five aircraft types – but in sufficient numbers to meet the requirements of a 42 squadron Air Force. Another great advantage of a four or five aircraft types Air Force is the ease of maintenance, training and logistics. In the present context and given costs to the nation, an ideal and healthy mix of aircraft types in the IAF could be – MiG variants (15 per cent), Mirage 2000s/Jaguars/LCA (45 per cent) and Su-30/Rafale (40 per cent). What is crucial however, is the phase-out/induction time frame of the old and new platforms – this will determine the operational preparedness and combat edge of the IAF at any given time.

It would make immense sense if the Rafale numbers are incrementally increased to form at least five squadrons (80 aircraft) for the ease of maintenance, training and logistics that is required to maintain a front line state-of-the-art aircraft such as Rafale. Also, given the size and expanse of our country and the airspace that needs to be controlled, defended even during peacetime and 'dominated' in times of war/conflict, the number of aircraft do matter! **SP**

The writer is former Chief of the Air Staff and former Member, National Security Advisory Board.

Indigenous GPS – What it means

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

Prime Minister Narendra Modi, along with many awed Indians, watched the successful launch of the Indian Space Research Organisation's (ISRO) PSLV-C33 satellite launch vehicle liftoff successfully from Sriharkota at 12.50 p.m. on April 28, placing the satellite IRNSS-1G in orbit some 20 minutes after liftoff. IRNSS signified 'Indian Regional Satellite System'. The first satellite of the series, IRNSS-1A was launched in July 2013. Two more satellites were launched during 2014. In January and March this year, ISRO placed the fifth and sixth satellites of the series in space (IRNSS-1E and IRNSS-1F).

IRNSS-1G being the seventh and final satellite, the seven satellite system which will be operational in two months from now, will provide India with its indigenous Global Positioning System (GPS), termed NAVIC, which can be used both in the military and civilian fields. With NAVIC (short for Navigation with Indian Constellation), India joins the exclusive club of nations having their own GPS, others with operational systems being the US (GPS), Russia (GLONASS), France (Doris) and China (BDS). The satellite systems of US, Russia, France and China have between 28 to 35 satellites because they have been developed for global coverage. India's NAVIC has seven satellites since it has been developed for regional coverage, which can always be expanded later, as required. It will cover a radius of 1,500 km with India as the centre. NAVIC is another remarkable achievement of ISRO that has made the nation proud. Congratulating ISRO on this milestone, Prime Minister Modi said, "We used to be dependent on others for navigation, today we have become independent", adding, "the new technology will not only benefit our people, our fishermen, but can also help the SAARC nations".

Pakistan of course being fully under the Chinese shadow has said that she is not interested in NAVIC. With People's Liberation Army (PLA) already deployed in PoK-Pakistan and China raising three additional divisions for protecting the CPEC, Pakistan would naturally bid for China's BDS.

From the military viewpoint, having an indigenous GPS is vital because without this, the service provider can feed wrong information anytime, particularly during critical time in during operations.

Alternatively, the GPS can even be switched off by the service provider, under guise of technical fault or even otherwise, which can be disastrous particularly for naval ships and vessels on the high seas. Additionally, encrypted precision is around 0.1 metre (as available to USSF and Spetznaz) but it is expensive and may not be provided by foreign vendor. NAVIC will provide accuracy of about 20 metres compared to 5 metres by America's GPS or Russia's GLONASS, but it will certainly reduce dependency on foreign satellite systems within the coverage area of NAVIC.

A major task, however, remains in how to provide the NAVIC facilities to the users – the public at large, the military and all other security forces. For this, ISRO has developed a coded chipset that can be incorporated with an existing receiver of a smart-phone or any positioning system device on vehicles, ships, helicopters or aircraft to communicate with the satellite for obtaining position-

ing information. ISRO has also been conducting meetings with navigation device manufacturers and mobile phone manufacturers to demonstrate how IRNSS could provide accurate information on par with the American GPS.

The challenge is not only improving accuracy but also mass produce ISRO's coded chipsets developed for incorporation in existing receiver. Individual receiver handsets for the military and security forces may have to be produced, if the ISRO developed chipset cannot be incorporated into existing GPS handsets. The overall numbers required, both for civil and military applications, would be gigantic, in millions, considering rising India's population and the pace of digitisation.

This would also have to be done speedily considering NAVIC would be operational in next two months. Multiple assembly production lines under 'Make in India' would perhaps be the right answer for the military and security forces, if the chipset cannot be given the pace at which ISRO is surprising India, and the world, it can perhaps be taken for granted that ISRO would be already working double time to improve the accuracy of NAVIC, especially encrypted precision so vital for military applications.

With the PSLV C34 launch slated from Sriharkota next month, injecting an incredible number of 22 satellites (18 for foreign agencies) simultaneously in space from a single rocket, ISRO would herald another great leap. This may be the precursor for NAVIC going global with better precision in a future time frame. **SP**



Prime Minister Narendra Modi witnessing the successful launch of IRNSS-1G in New Delhi

Aerial solutions for firefighting task

The raging forest fires in Uttarakhand and the inability to douse the fires immediately has thrown up the issue of equipment and also strategy. We have listed some aerial solutions in this onerous task.



Ilyushin Il-76TD: Specifications

Length	46.6 metres
Height	14.76 metres
Wingspan	50.5 metres
Number x engine type	4 x turbojet engine
Engine model	D-30KP series 2
Maximum take-off weight	190 tonnes
Maximum payload	50 tonnes
Cruising speed	750-800 kmph
Flight altitude	9,100-12,100 metres
Flight range with payload of 40 tonnes	4,900 km
Crew, persons	7

Source: www.ilyushin.org

Beriev Be-200: Specifications

Length	32.05 metres
Height	8.90 metres
Wingspan	32.78 metres
Type of engine	D-436TP
-take-off power	2 x 7,500 kgf
-cruise power	2 x 1,500 kgf
Maximum take-off weight	37,200 kg
Maximum amount of water	12,000 kg
Maximum cruising speed	710 kmph
Flight altitude	8,000 metres
Flight range	3,850 km
Crew, persons	2

Source: www.beriev.com



Bombardier 415: Specifications

Length	19.8 metres
Height	8.98 metres
Wingspan	28.6 metres
Number x engine type	2 x turboprop
Engine model	Pratt & Whitney Canada PW 123AF
Maximum take-off weight	18,597 kg
Maximum payload	2,903 kg
Cruising speed	333 kmph
Crew, persons	2

Source: www.bombardier.com



Rockwell Collins announces senior leadership appointments

Rockwell Collins recently announced that Jeff Standerski has been named Senior Vice President, People and Inclusion. In this role, Standerski leads the global human resources function at Rockwell Collins, including Compensation and Benefits, Organisation Development and Training, Diversity and Inclusion, Employee and Labor Relations, Talent Acquisition and Human Resources Delivery.

Dave Nieuwsma, formerly Vice President, Strategy and Business Development for the company's Government Systems business, will assume the role of Senior Vice President, IMS, replacing Standerski. Both appointments are effective immediately.

"Jeff's ability to effectively drive change, transform organisations and build a strong culture has been proven repeatedly in his various roles at the company, especially guiding employees through the transition from ARINC to Rockwell Collins," said Rockwell Collins Chairman, President and CEO Kelly Ortberg. "His proactive leadership style, combined with his extensive experience across our business, will prove invaluable as we continue to advance



Jeff Standerski



Dave Nieuwsma

our culture and evolve our people and inclusion strategies."

Regarding Nieuwsma's appointment Ortberg commented, "Dave brings a fresh perspective to our IMS organisation as we look to further expand our information management services capabilities and offerings beyond its core commercial aviation business. His diverse background and global business development experience will serve us well as we focus on growing our IMS business."

Standerski has led the IMS organisation since Rockwell Collins' acquisition of ARINC in December 2013. Standerski joined Rockwell Collins in 1989.

Nieuwsma previously served as Vice President and General Manager of Airborne Solutions for the company's Government Systems business, where he was responsible for profit and loss, customer relationship management, programme execution, and new business pursuits. Nieuwsma has been with Rockwell Collins since 1991, serving in multiple leadership roles across the company's Commercial Systems and Government Systems businesses. **SP**

IAF gears up for Exercise Red Flag at Alaska



Air Marshal P.P. Khandekar takes over as Air Officer-in-Charge Maintenance

Air Marshal P.P. Khandekar assumed the responsibilities of Air Officer-in-Charge Maintenance at Air HQ, New Delhi on May 2, 2016. The Air Marshal is a graduate of VNIT, Nagpur and was commissioned in IAF as Aeronautical Engineering (Electronics) stream on July 25, 1977. He is a post graduate in industrial engineering from NITIE, Mumbai, an alumni of Defence Services Staff College, Wellington and Master in Science in Defence & Strategic Studies from Madras University.

He is a fellow of IETE and Member of AeSI, IIE, CENJOWS and CSI. Air Marshal PP Khandekar has rich experience on aircraft such as Su-7, MiG-23 and MiG-27. He has commanded Air Force Station High Grounds and Air Force Station Kanpur. **SP**



(Top, L-R) Indian Air Force (IAF) Su-30MKI prepare to land at the Eielson Air Force Base, Alaska, on April 16, 2016; IAF Su-30MKI lands at the airbase; (Above, L-R) IAF's IL-78MKI aerial refuelling aircraft lands at the airbase; IAF personnel at the Eielson Air Force Base preparing for Exercise Red Flag at Alaska.



Donald Trump's rally affected

A man jumped a security barrier and rushed the stage at Donald J. Trump's rally in Dayton, Ohio, recently, leading to a brief moment of panic when Secret Service briefly surrounded the candidate. The night before, Trump abruptly cancelled his rally in Chicago as hundreds of activists scuffled with his supporters inside the arena where it was to take place. But the Dayton event was relatively quiet, by Trump's standards, until the end.

One man began protesting about 10 minutes before Trump finished talking. "What took him so long to put up his hand, we're almost finished!" Trump said, mocking the man and telling him to "go back to mommy." Not long after that person was escorted out, a man jumped over a security barrier and rushed towards the stage, a moment captured on a video quickly posted to YouTube.

People could be heard screaming, and Trump ducked his head, grabbing his podium with both hands. One of Trump's personal security guards was the first to jump on stage. Three other men who appeared to be Secret Service agents jumped on stage, and all formed a ring around Trump for a few moments.

In an e-mail, a spokeswoman for Trump, Hope Hicks, said, "A man attempted to breach the secure buffer and was removed rapidly and professionally." According to the Secret Service, the man was arrested by the Dayton Police Department. **SP**

Football's worst tragedy, Liverpool fans vindicated

In 1989, the worst football tragedy occurred at Hillsborough soccer stadium in which 96 men, women and children died. After 29 years an inquest has delivered its verdicts on a series of key questions. It has been the longest case heard by a jury in British legal history.

The jury's findings included that the 96 Liverpool fans who died in the Hillsborough disaster were unlawfully killed, jurors concluded by a 7-2 majority. The match commander Chief Superintendent David Duckenfield's actions amounted to "gross negligence" due to breach of his duty of care to fans. The police planning errors caused or contributed to the dangerous situation that developed on the day of the disaster.

Pete Weatherby, a lawyer representing some of the bereaved families, told a Hillsborough Justice Campaign news conference: "The jury has vindicated the long, long journey of the families to obtain justice and make those responsible for the disaster accountable."

Weatherby said there had been "concerted attempts to cover up" what happened and paid tribute to the "dignity and tenacity" of the families in their battle for justice. "The disaster was entirely avoidable and caused by catastrophic human failure," he said, focusing on what he called "a catastrophic policing failure by South Yorkshire Police."

Weatherby said the families had been forced to endure "lies by senior officers and vile abuse in parts of the media" in the years after the tragedy in what he said was "a culture of denial writ large." **SP**

Only three US airports require employees to go through security check

The Transportation Security Administration (TSA) administrator Robert Neffenger admitted recently that only three US airports require employees to go through a security check before entering 'secured' areas of the airport. Neffenger made the confession to lawmakers at a Senate Commerce Committee hearing on TSA security.

Atlanta, Miami and Orlando's airports are the only three to require employee security screenings, Judicial Watch said. Senators reached a deal to bolster travel security in the wake of the terrorist attacks in Brussels, with measures that include doubling the number of TSA security teams with bomb-sniffing dogs at domestic airports. Other measures would also bolster the vetting of airport employees and add security to baggage claim areas.

Neffenger's admission comes on the heels of several incidents involving gun and drug-smuggling operations by airline employees at major airports, including airports in Atlanta, New York and San Francisco. In March, it was reported that in 2015, the Department of Homeland Security had identified over 70 employees at nearly 40 airports across the country who have been flagged for possible ties to terrorism. However, TSA officials have said those employees are not necessarily involved in terrorism. **SP**



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