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## How to fire up defence production

*The path to self-reliance lies in domestic industry taking up new product development with tech support from DRDO*

The Defence Production Policy (DProP) 2018, announced in March, has set ambitious goals for 2025. It includes ₹1,70,000 crore worth of production, ₹35,000 crore of exports, and investment to the tune of ₹70,000 crore. It would, thereby, create two-three million jobs domestically and aim to achieve global leadership in artificial intelligence and cyberspace technology. To drive this policy, the government has identified 13 product categories and permitted 74 per cent FDI in “niche” technologies. It also plans to develop two defence production corridors, which constitute private sector units and , and establish defence innovation hubs. Surprisingly, there is no analysis of why earlier



defence procurement policies failed to deliver results and whether the initiatives spelt out in the new policy are adequate to ensure success. Why has FDI not brought in any foreign companies with their advanced technologies? Why has the private sector not entered defence production in a big way? Why does the country still import 70 per cent of its critical defence equipment despite several defence public sector undertakings, ordnance factories and defence research laboratories? After all, self-reliance has been the Indian motto for seven decades of nationhood. Would FDI and its accompanying expectations of high-technology transfer prove successful? There is a mistaken belief that production companies decide on transfer of technology and that foreign manufacturers would be attracted by the mega Indian market for their products. Governments, not manufacturers, decide technology transfer based on political and military considerations, geopolitical factors and long term business commitments. And even then, certain cutting-edge technologies are closely guarded and foreign companies will not part with them under any circumstances. And, can any government assure the foreign companies that orders will continue to be placed for all time to come? Clearly, the FDI route is no salvation for self-reliance in defence production.

### **Self-reliance goal**

It is a truism that success follows strategy and strategy in turn follows structure. Can the existing Indian defence production structure prove suitable to attain self-reliance? How are other countries able to fulfil their military technology requirements? What lessons can India learn from them? Every military needs reliable and robust combat/combat support systems to counter threats from its adversaries. Technology of the equipment should match, or preferably be better than, the technology its adversaries deploy. The military also expects product support — technical manuals, spares, repair and overhaul, trainers and simulators besides mid-life upgrades during the equipment life cycle which typically will be about 20 years. Undoubtedly, the public sector industry alone can meet these requirements. And to stay in business, both public and private industry will have to invest in R&D and be able to design and develop next generation products and systems. It is equally important to realise that research, design and development and manufacture are closely coupled and are best done under one roof.

### **Assistance from DRDO**

However, the reality is that domestic industry, particularly the private sector, lacks the capability, domain knowledge, skill, expertise and experience or capacity in terms of adequate trained manpower, specialised test facilities, test ranges, etc., in many areas at present. In such cases, while industry would be the lead agency for development of new products, it may seek the help of DRDO laboratories to make up for shortage of expertise. Industry may sub-contract development of certain sub-systems to a DRDO laboratory on payment or obtain services of DRDO scientists on deputation or hire test facilities on payment.

One time technology purchase may be permitted for a start but companies must be told that they are expected to develop upgrades, variants and next generation technologies indigenously. It would amount to marriage of industry's managerial acumen and DRDO's technical expertise for optimum results. Over seven to ten years, Indian industry ought to become self-sufficient and be able to develop new technologies independently. During this period, some DRDO scientists may get absorbed by industry and some may even start their own enterprises. Those with a purely scientific bent of mind will be the core of the transformed DRDO which should morph into an equivalent of DARPA in America with focus on futuristic technology development and involve universities and research laboratories. The new methodology, therefore, would not endanger the careers of DRDO scientists.

Another essential structural change necessary is that the armed forces should fund the development of new products from their own budgets to give them a sense of "ownership". Today, the MoD funds the DRDO for development of new products which results in minimal interaction between the armed forces and developer. Therefore, money from the military budget will give the armed forces an incentive to monitor the progress at regular intervals, participate in inevitable trade-offs between conflictual requirements, make-buy decisions, trials at sub-system stage, authorise release of funds based on accomplishment of milestones, etc. Such an approach would minimise time and cost overruns and shortfall in specifications. The development contracts can be on fixed price, cost plus fixed profit or cost plus fixed percentage of profit dependent on complexity and unknowns. The defence accounts would need to develop expertise to scrutinise cost plus contracts and release instalment payments. The armed forces would need to develop project monitoring skills.

### **Manufacturing ecosystem**

Today, manufacturing industry is organised into a three/four tiered structure. For instance, in the automobile industry Maruti Suzuki, Hyundai and Tata Motors are tier one companies who source sub-assemblies and parts from tier two, tier three and tier four companies. Tier one companies are "integrators" and the whole chain forms an "ecosystem" which the DProP 2018 recognises. However, it is industry which can create and nurture such ecosystems, not the government. To assure long term loyalty and commitment, tier one companies have to necessarily handhold MSMEs initially and perhaps even invest in equity to nurture an umbilical relationship with them. The defence production sector would need about 20 tier one companies and several lower tier companies. Therefore, for DProP 2018 to succeed this is a model could be considered or else it could meet the same fate as earlier policies.

<https://www.thehindubusinessline.com/opinion/how-to-fire-up-defence-production/article24211990.ece>

## **Business Standard**

*Fri, 22 June, 2018*

### **BrahMos leads Indian charge at Paris defence show**

There was a stark difference in the Indian presence at Eurosatory, the just-concluded biennial defence show here. While the previous edition, held in June 2016, had seen some of the heavyweights of Indian DPSUs, including the Garden Reach Shipyard and the Ordnance Factories Board, as well as the Defence Research and Development Organisation (DRDO), the turnout of Indian companies at this years edition could hardly have been more different. Leading the Indian presence was the Brahmos Aerospace Indo-Russian joint venture that can easily be termed the most successful example of an Indian firm developing an entire range of new products that not only meet the requirements of the Indian defence forces, but also elicit regular enquiries from numerous potential buyers around the world. Colonel J.P. Uniyal, Director of Business Development and Product Support, at BrahMos said that even though BrahMos had skipped the last edition of Eurosatory, the participation this year has been very successful and highly satisfactory.

"We have had numerous meetings with potential buyers who are very interested in our products and especially the recent innovation of the variants that can be launched from an aircraft, as we have proven by testing BrahMos on the Sukhois used by the Indian Air Force," Uniyal told Media India Group. According to Uniyal the principal enquiries came from countries like South Korea and Brazil. "With some of these

countries, we have been having discussions for a while. But it was important to be here and meet with them again as in the weapons' business, like any other business, you need to be seen at key global platforms such as Eurosatory to stay on the top of the mind of your customers. If you are absent frequently, then they tend to find other suppliers," he said. BrahMos had also perhaps the most appealing display at the event, amongst the Indian participants. MKU, a Kanpur-based defence manufacturer, too had an active presence at the event, with the company displaying several of its products to attract buyers at the event, a strategy that perhaps proved to be highly successful, if the beeline of visitors to MKU stall was any indication.

One highlights of the Indian presence at the Eurosatory was the participation of a number of Small & Medium Enterprises in the domain of defence, ranging from protective gear and clothing to speciality steels and manufacturers of ancillaries for larger defence material like tanks, trucks and guns. Sweta Chaudhry Singh, Director of Frontier Protective wear, a manufacturer of protective clothing based in Kolkata, said the participation in Eurosatory was good for her firm. "Basically, it was a good show for us. We had come to develop our market in Europe further as we already have some customers in Germany. We were also looking for new partners and on both the parameters, the show proved to be successful," she said. Though there were only a handful of Indian firms that had their own stall like Frontier Protective wear at the event, a number of SMEs had also come as part of delegations led by chambers of commerce such as FICCI and ICC, Kolkata. "These firms were looking for collaboration in terms of boosting their design capabilities as well as to identify those French and global partners who could be interested in transfer of know-how to Indian companies," said Sourav Raichudhuri of the Paris Chamber of Commerce (CCIP), which had organised B2B meetings for the Indian delegation. The Indian companies were also scouting for clients who needed their prowess in software development. Drones and composite materials were high on the wish list of the Indian firms.

[https://www.business-standard.com/article/news-ians/brahmos-leads-indian-charge-at-paris-defence-show-118062000932\\_1.html](https://www.business-standard.com/article/news-ians/brahmos-leads-indian-charge-at-paris-defence-show-118062000932_1.html)



*Fri, 22 June, 2018*

## **Russia and India Had Big Plans to Build a Stealth Fighter. So What Happened?**

Previously, it was believed that India had soured on the agreement because the Indian Air Force (IAF)



didn't believe that Russia's designs could meet its operational needs. The new report said that the IAF did indeed have these concerns, however, they were informed that measures could be taken that could address these reservations. While these discussions were ongoing, DRDO was asked about its opinion of the project, and "whether the deal would result in the infusion of high-end technologies in India." The "emphatic response by then DRDO chief, S Christopher," was that his organization was capable of producing the necessary technology itself. This "sealed the fate of the program,"

The program to co-develop a fifth-generation fighter jet— called the Sukhoi/HAL Fifth Generation Fighter Aircraft (FGFA)— dates back to 2007, when India and Russia signed a mutual agreement. The aircraft was envisioned as a "multi-role, single seat, twin-engine air superiority/deep air support fighter with stealth capabilities and is based on the Sukhoi PAK FA (Prospective Airborne Complex of Frontline Aviation) T-50 prototype." The 2007 agreement was followed three years later by the two sides signing a \$295 billion preliminary design contract for the fifth-generation aircraft. At that time, Russia agreed to purchase 250 planes while India signed on for 144 of them. But five years later, in 2015, Moscow announced that it would only be purchasing 12-16 planes, raising concerns in Delhi. This dispute held up the signing of a final design

agreement in which both sides were expected to contribute \$6 billion to the design and production of the plane. To appease India, Moscow made a number of concessions on the cost and number of prototypes of the plane, as well as other issues. While it once appeared things might be back on track— as late as January of this year there were reports the contract would be signed soon— ultimately India appears to have pulled out of the agreement.

As noted above, part of the reason for this was that the Indian Air Force had soured on the plane. The IAF had a number of complaints about the aircraft. First among them is that the Air Force believed the plane's stealth and cross-section features would be inferior to America's F-35. IAF officials were also concerned that Russia wanted to use existing engines for the plane rather than develop new ones. "Current prototypes of the aircraft are fitted with a derivative of the Russian-made Saturn AL-41F1S engine, dubbed AL-41F1, an older aircraft engine also installed on the Sukhoi Su-35S Flanker-E," The Diplomat reported in April 2018.

Another issue, according to an October 2017 article in *Defense News*, is that the FGFA "does not have modular engine concept, making maintenance and serviceability of the fleet expensive and troublesome." An IAF official explained to *Defense News* that the lack of a modular engine would prevent India's Air Force from repairing planes in-house. Instead, servicing would have to be performed by the manufacturer. Previously, IAF sources have complained about the high maintenance costs of the Su-30 planes India purchased from Russia.

<http://nationalinterest.org/blog/the-buzz/russia-india-had-big-plans-build-stealth-fighter-so-what-26346>



*Fri, 22 June, 2018*

## **India set to clear \$2bn deal for US antisubmarine warfare choppers**

Ahead of the crucial two-plus-two dialogue in Washington, the Modi government is expected to approve a \$2-billion deal for the purchase of anti-submarine warfare helicopters for the Indian Navy from the US through the government to government (G2G) route, according to South Block officials who spoke on condition of anonymity. Bilateral negotiations on the Communications, Compatibility and Security Agreement (COMCASA) have moved forward and the military communication agreement could be initialed later this year after basic Indian concerns have been addressed by the Pentagon, these officials added. The foreign and defence ministers of India will meet their US counterparts in Washington on July 6. South Block officials said the Defence Acquisition Council is scheduled to meet on June 30 to give a final approval to the purchase of US Sikorsky S-70B multi-role helicopters.

### **Govt may clear deal for combat choppers**

the navy needs at least 100 such multi-role helicopters, the government has decided to go for the outright purchase of 24 anti-submarine warfare helicopters from US. There is also the possibility of India placing a follow-up order for 12 more Boeing P 8I maritime surveillance aircraft at a later stage for the Indian Navy in a bid to boost its reconnaissance capabilities on high seas, the officials added. Although preparations for the two plus two dialogue have begun in the earnest in Delhi, the COMCASA agreement will have to wait for later this year after the Indian side conveyed some concerns on the foundational agreement related to military operations. While both sides have broadly agreed to the text of the key foundational agreement, visiting senior Pentagon official Joseph Felter was briefed about India's concerns and the way forward. The meetings on COMCASA took place on June 19-20. Senior government officials did not rule out the possibility of US Defence Secretary James Mattis visiting India later this year to sign the COMCASA agreement. However, the focus of the two plus two dialogue will be on how India, a major defence ally of the US, will avoid getting hit by the Countering America's Adversaries through Sanctions Act (CATSA) over its future purchases of military hardware from Russia.

## **NASA's Curiosity rover captures images of Martian dust storm**

NASA's Curiosity rover has beamed back pictures of a dust storm that has engulfed much of Mars over the last two weeks and prompted NASA's Opportunity rover to suspend science operations, the US space agency said today. However, the Curiosity rover, which has been studying Martian soil at Gale Crater, is expected to remain largely unaffected by the dust.

While Opportunity is powered by sunlight, which is blotted out by dust at its current location, Curiosity has a nuclear-powered battery that runs day and night. The Martian dust storm has grown in size and is now officially a "planet-encircling" dust event. Though Curiosity is on the other side of Mars from Opportunity, dust has steadily increased over it, more than doubling over the weekend. The atmospheric haze blocking sunlight, called "tau," is now above 8.0 at Gale Crater - the highest tau the mission has ever recorded. Tau was last measured near 11 over Opportunity, thick enough that accurate measurements are no longer possible for Mars' oldest active rover. For NASA's human scientists watching from the ground, Curiosity offers an unprecedented window to answer some questions such as why some Martian dust storms last for months and grow massive, while others stay small and last only a week. The last storm of global magnitude that enveloped Mars was in 2007, five years before Curiosity landed there. Daily photos are being captured by the Curiosity rover's Mast Camera, or Mastcam, show the sky getting hazier. This sun-obstructing wall of haze is about six to eight times thicker than normal for this time of season.

## **People know more about mars than Himalayas**

Turns out, people know more about Mars than about the young Himalayan ranges. "We know more about the rocks on parts of Mars than we do about some of the areas in the Himalaya," said a scientist, Alka Tripathy-Lang. In this regard, a group of scientists from Arizona State University have started to use data from Terra, a satellite orbiting the Earth, in the same way, that planetary geologists have been using data from the Mars-orbiting satellite, Odyssey. Many researchers have done extraordinary geologic mapping in this rugged region, but the fact is that some places are just completely inaccessible because of topography, elevation, or geopolitical issues. The rocks in those areas are an important piece of the tectonic puzzle and are important for understanding the way the region evolved," said Wendy Bohon, another scientist working on this subject. "The tools we used, originally developed for mapping rocks on Mars, were a way to safely access information about the rocks in the Himalayas," she added. The researchers relied on the fact that every mineral has a unique spectral "signature," where some parts of the thermal infrared spectrum are absorbed, while the other parts are reflected.

Rocks are made of different combinations of minerals, so when all of these mineral signatures are combined, they reveal the rock type. To easily distinguish between different kinds of rocks, the researchers translated these signals into red/green/blue imagery, which results in a distinguishable colour for each rock type. This can subsequently be used to map the distribution of rocks throughout the region. To double-check that the colours they're mapping are truly the rock type predicted by the imagery, the researchers took hand samples from accessible locations in the study area to the laboratory and measured the spectral signatures of each rock using a thermal emission spectrometer