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Rajnath pushes for indigenisation of defence equipment

Pushing for indigenisation, Union Defence Minister Rajnath Singh on Tuesday urged Scientists in the Defence Research and Development Organisation (DRDO) to establish a system in India where all defence equipment can be manufactured in the country.

He said, "DRDO has empowered the country with cutting edge technology."

Singh, addressing the 41st DRDO Directors Conference in Delhi, said that despite various restrictions and limited capabilities, DRDO has succeeded in developing a variety of systems, products and technologies needed to enhance the forces.

Urging to reduce dependency on imports of defence facilities, the Defence Minister said, "We will have to focus on research work to emerge as the global leader in defence technologies. And for this, it is important to improve continuously in order to maintain operational superiority."

Paying tribute to late President A.P.J. Abdul Kalam, Singh said, "I express my gratitude to A.P.J. Abdul Kalam on his 88th birth anniversary. He was an acknowledged scientist. His contribution to research and missile development brought India in a list of countries known for their indigenous capabilities."

The minister said, "I am happy that DRDO has achieved the targets set for 100 days. They have also identified milestones to commemorate the 75 years of independence. It is also heartening to note that they have added to their strength in order to achieve complete self-reliance in coming years."

Speaking on the occasion, National Security Advisor Ajit Doval said that armies that were better equipped always called the shots and decided the destiny of mankind. "They were always the one which had higher technologies. India's own historical experience on this has been sad, we were the runner-up. There is no trophy for the runner-up," he said.

Doval stressed that either one is better than adversaries or one is not there at all. "In the modern world, technology and money are two things which will influence geopolitics," he said. He also stressed technology has to be need-based.

"We along with our defence services and intelligence agencies have to make a hard assessment of our needs which will give us an edge over our adversaries," he said.

Army Chief General Bipin Rawat complimented DRDO for making strides in ensuring that requirements of the services are met through home-grown solutions. He said, "We will fight and win the next war through indigenised weapons systems and equipment."

Rawat stated that DRDO has made major strides to ensure that needs of the services are met by providing various systems like artillery gun systems, mines, anti-tank missile systems, etc. He was confident that future wars will be won with indigenous systems.

Chief of Naval Staff Admiral Karambir Singh in his address stated that Indian Navy is efficiently using Varunastra, Maareech, Ushus, TAL and various other DRDO developed systems.

Rajnath Singh added that warfare and technologies are synonymous and undergo rapid changes. These must be factored during design stage.

Speaking on the occasion, Air Chief Marshal R.K.S. Bhadauria said that technology leadership is what defines DRDO. He also mentioned that DRDO has been able to achieve the objectives of self-reliance to a great extent in the past seven decades. He appreciated DRDO's role in Electronic Warfare Technologies, radars, composite materials for LCA, AEW&C, Astra and various other technologies.

He also appreciated the capabilities of LCA Tejas and asked DRDO to develop next generation aircraft AMCA, harnessing the technologies and experience of LCA.

Satheesh Reddy, Secretary Department of Defence R&D and Chairman DRDO spoke about successful development of ASAT, BrahMos, ASTRA, Nag missile, SAAW, Arjun MBT Mk 1A, 46 metre Modular Bridge, MPR, LLTR Ashwini, etc. He added that the theme for 41st DRDO Directors' Conference is technology leadership for empowering India, in line with the requirement to develop indigenous systems with advanced technologies.

The Defence Minister also released two compendia namely the DRDO-Industry Partnership: Synergy and Growth and DRDO Products with Potential for Export. DRDO Policy and Procedures for Transfer of Technology to support industry was also released by him.

Singh also launched the new website of DRDO.IANS

<http://www.theweekendleader.com/Headlines/40549/rajnath-pushes-for-indigenisation-of-defence-equipment-.html>



Fri, 18 Oct 2019

Develop need-based cutting-edge weapons: Defence Minister, NSA exhort DRDO

By Ravi Shanker

India's top security leadership stressed the urgent need for DRDO to innovate and develop home-grown hi-tech weapon systems to make India not only self-reliant in defence manufacturing but also a global leader in the field.

Addressing the 41st Directors' conference of Defence Research and Development Organisation (DRDO), Defence Minister Rajnath Singh asked scientists to develop 'indigenous innovation ecosystem' with less dependence on imported systems to achieve self-reliance in critical technologies. "Development of technology should be cost-effective and time-efficient," he added. The event coincided with the 88th birth anniversary of former President Bharat Ratna Dr A P J Abdul Kalam.

Stressing the need to bridge the technology gap for India to become a global leader in research and development, Defence Minister urged the scientists to focus on technologies that provide cutting edge capability and remain relevant for the next 15-20 years. He suggested that scientists devise an action plan for excellence in defence R&D that can take India to renewed heights in defence capability and make India a 'technology exporter'.



National Security Adviser Ajit Doval also called for the development of “need- based” niche technologies that can cater to the specific requirements of Indian armed forces. Highlighting the emerging security challenges, the NSA said “India’s security vulnerabilities are much greater today, and they are going to be much greater in times to come.”

While elaborating about niche technology, Doval, observed that it was not about the best technology in the world but it was something which could make India more potent. So it has got to be need-based which can give India an edge over its adversaries and is affordable. “Development of technology should not overrun timeline that is not acceptable” the NSA stated.

Stressing upon the importance of enhancing Indian capabilities for technology absorption, Doval said that constant adaptation and change are the essence of progress. Therefore, we should not be shy to revisit basics and realign our structures in line with emerging realities. Exhorting DRDO scientists, the NSA said, “This is the game where the winner takes it all and there is no trophy for the runner-up.”

Indian Army Chief General Bipin Rawat said the DRDO needed to look at systems for future warfare. He called upon scientists to start looking at development of cyber, space, laser, electronic and robotic technologies and artificial intelligence. Lauding indigenous technology and weapon systems General Rawat said “We will win the fight the next war with homegrown defence technologies.”

Emphasising on the need of indigenous technology, Air Chief Marshal RKS Bhadauria said, “The advantage of the indigenous technology is that we are in a continuous dialogue and we can change the specifics and requirements as per our need and performance.” Keeping in view the quest of the Indian Air Force’s future leadership, Air Chief said that the DRDO should make the indigenous fifth-generation fighter aircraft, Advanced Medium Combat Aircraft (AMCA) happen, and must succeed. Exhorting the defence research agency he said “As not only your pride is at stake but also the Indian Air Force.”

The Navy Chief, Admiral Karambir Singh urged DRDO to pursue the necessity of a technologically up-to-date force. “Our impetus, therefore, in partnership with DRDO is to focus on ‘niche technologies’, and strict timelines so that we can come up with a few path breaking innovation for defence,” said Admiral Singh.

Dr G Satheesh Reddy, Secretary DDR&D and Chairman DRDO also addressed the gathering and put out the report card of the defence research agency during the inaugural session of the two-day conference.

<https://bharatshakti.in/develop-need-based-cutting-edge-weapons-defence-minister-nsa-exhort-drdo/>



Fri, 18 Oct 2019

Indigenous 155mm Dhanush towed gun system: ‘Desi Bofors’ to improve Indian Army’s firepower along Pakistan, China borders

The Gun Carriage Factory had received the order for Dhanush in 2011, and the first prototype was made in 2014

By Huma Siddiqui

As part of the Indian Army’s operational readiness, the indigenous 155mm Dhanush Towed Gun System is under induction. The gun system is going to qualitatively improve the firepower of Indian

artillery and is also expected to make way for the private sector gun manufacturing companies. Indian Army has placed an order for a total of 114 'Dhanush' with the Ordnance Factory Board (OFB).

During the ongoing Army Commanders Conference, the top commanders discussed various options for the employment of this gun, sources confirmed to Financial Express Online.

The OFB will hand over 18 155mm x 45 calibre artillery guns to the army's Central Ordnance Depot in Jabalpur and before the year ends these indigenous guns will be deployed along the Pakistan and China frontiers. These are being under production at the Jabalpur-based Gun Carriage Factory (GCF), at a cost of Rs 14.50 crore.

The indigenous gun — towed and self-propelled mode has undergone extensive trials in extreme weather conditions as well as difficult terrains across the country including Sikkim, Leh, Odisha and Jhansi.

The guns will come with almost 85 per cent indigenous material has a range of 38 km and in the army, it is classified as 'medium artillery'. There has been active participation of both private and public sector companies like SAIL, BEL working with the OFB on this project. Also, besides the Indian Army, the Defence Research and Development Organisation (DRDO), as well as DGQA, have been actively involved in this project. The Gun Carriage Factory had received the order for Dhanush in 2011, and the first prototype was made in 2014.

World's best combat helicopter 'Apache AH-64E' comes to India

More about Dhanush

- The indigenous gun comes with inertial navigation-based sighting system.
- It has an advanced day and night direct firing system.
- On-board ballistic computation.
- Mechanically it has been upgraded to fire NATO standard 155 mm ammunition.
- It comes with a self-propulsion unit and this for the gun to be self-deployed in mountainous terrains.
- Bi-modular charge system (BMCS) which help in increasing the range.
- The gun has been upgraded electronically which helps in enhancing firing accuracies.
- It is also compatible with other kinds of ammunition.

The induction of this type of gun is part of the Indian Army's 'mediumisation' of the artillery and under this will replace 'field guns' of a calibre such as 105 mm and 120 mm.

<https://www.financialexpress.com/defence/indigenous-155mm-dhanush-towed-gun-system-desi-bofors-to-improve-indian-armys-firepower-along-pakistan-china-borders/1738562/>



Fri, 18 Oct 2019

List of top 5 Indigenously developed weapons/systems of India

By Hemant Singh

India was the world's largest arms importer from 2014 to 2018 but later on Saudi Arabia became the number 1 arm importer in the world. But still India imports a lot of weapons for its military requirements. Government of India is striving to boost manufacturing of weapons in India through

Make in India initiative. India has developed many weapons Indigenously which includes Tejas aircraft, Arjun Tank and AKASH Missile etc.

In the union budget 2019; the defence budget of India touched Rs 3.18 lakh crore which is around 1.6% of the GDP. The government of India wants to reduce its arm import bill in the upcoming years. Currently India is second largest arm importer in the world.

According to the latest report published by the Stockholm International Peace Research Institute (SIPRI) in march 2019; India has share of 9.5% of total arms sold in the world. Saudi Arabia is on the top by having 12% share in the global arms import.

The government of India is trying its utmost efforts to reduce the defence import bill of the country. In this direction; India has developed many weapons indigenously. We have explained about these weapons in this article.

Let us read about these top 5 weapons/systems in detail.

1. Tejas Aircraft

The Tejas is an indigenous light weight, multi role supersonic aircraft. It is developed for both training and fight purposes. The Tejas is designed to carry a air-to-air, air-to-surface strikes. It has the capability of successful air-to-air Refuelling.

Currently this aircraft is in service. The Indian airforce has already contracted 40 aircraft and it will soon order 83 more Tejas aircrafts with the Hindustan Aeronautics Limited (HAL). We hope that very soon Tejas will replace India's ageing MiG-21 fighter jets.

2. Arjun Tank

It is a 3rd generation main battle tank developed by DRDO. It was first produced in 2004 and its one unit cost is around Rs.56 cr. It was built indigenously and India has around 366 units of this tank. It is named after "Arjun" the hero of Epic Mahabharata.

3. NETRA

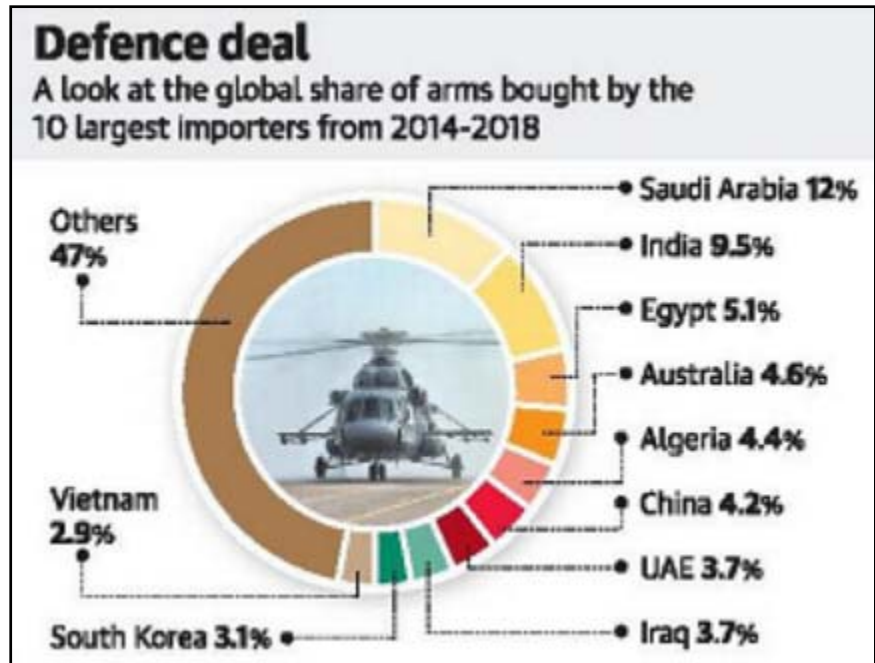
The full form of NETRA is "NETwork TRaffic Analysis". NETRA is a software network developed by India's Centre for Artificial Intelligence and Robotics (CAIR). It is used by the Research and Analysis Wing (RAW) and Intelligence Bureau.

Indian Airforce inducted its first indigenously developed airborne control system in 2017. NETRA AEW&C system has range of 200KM.

You can imagine the capabilities of the NETRA that it can analyse voice traffic passing through software such as Google Talk and Skype.

4. ASTRA

This is an all weather beyond-visual-range air-to-air missile. Astra is an first air-to-air missile designed by the Defence Research and Development Organisation indigenously and manufactured by the Bharat Dynamics Limited. Its first unit was produced in 2017 and cost of one unit is Rs. 7-8 crore.



It can be launched from the Su-30MKI aircraft and its speed is 4.5 mach or 5556.6 km/hr. It will be inducted into the Airforce soon.

5. AKASH:

AKASH is a "Surface to Air" medium range Missile. It can hit multi-target engagement at a time.

The capability of this supersonic Akash missile is that it can hit an aircraft up to a distance of 25 km and up to the altitude of 18,000 mtr or 59,000 ft.

Even it has the capability to neutralise aerial targets like ballistic missiles, fighter jets, cruise missiles and air-to-surface missiles.

The supersonic Akash missile system was formally inducted into the Indian Army on May 5, 2015 and into the Indian Air Force on July 10, 2015.

It is in service since 2009 and 3000 missiles have been built so far. It is designed by the DRDO and Manufactured by Ordnance Factories Board, Bharat Dynamics Limited and Bharat Electronics Limited.

So these were some weapons and systems indigenously developed in India. We hope that very soon India would produce more capable weapons in the future.

<https://www.jagranjosh.com/general-knowledge/indigenously-developed-weapons-of-india-1571311542-1>



Fri, 18 Oct 2019

While we must welcome Rafale, ADA, DRDO, IIT's & HAL must also be appreciated

Rebuttal to an article that I read in Times of India webpage on Indian Aeronautical program

By Phani Praveen

Doing good research and producing cutting edge technology is really a nightmare in India. DRDO, ISRO and DAE have defied the ground conditions, again and again.

I had come across an article with a interesting heading in **Times of India** Web-page^[1]. After going through the first few lines I was pretty sure that the author did not have an idea of basic ground realities.

Producing **technology** involves people with a very strong foundation in sciences. The realization of sciences is through **technology**. It is very unfortunate that most of the people here in India, even those in respectable positions **do not understand** the difference between the two and the impact each has on the other.

The western world has been successful because they have understood the "**Scientific Creed**" and are always trying to evolve them, even when the evolution is pointing in the wrong direction. On the other hand, we have always fallen behind by trying to **mimic** their **methodologies** and **research strategies** without understanding them. A casual look at the academic rankings of world universities shows where we as a country stand in producing scientific knowledge[2].

“ *As of today, all you find are students with a flashy mark-sheet, very eager to get a five-figure salary and wanting to go on a foreign trip at the company's expense.* ”

If we happen to look at an engineering student who has finished his/her M.Tech in Computer-Science, they are **not in a position** to write a 200 line code in C language. Similarly, an M.Tech student in signal processing is unable to understand the fundamental "**Discrete Fourier Transform**", so is the case with an M.Tech student in VLSI design. He is not able to produce a simple hardware module in Hardware Description Language, that works in sync with other modules. Let's assume that, for some reason or other the students are not in a position to do the above-mentioned tasks, even their teachers are **unable** to do them.

Let's not talk about the basic science stream in India, Students taking these courses are left-overs from engineering admissions.

If this is the current level of standard in Indian Education system, how can we expect to develop cutting edge technology in India? **IIT's** are not silver bullets for everything, also these are not exceptionally brilliant from others.

Unless or until you have bright enthusiastic students out of college with a firm grounding in knowledge you cannot do anything in the area of technology. As of today, all you find are students with a flashy mark-sheet, very eager to get a **five-figure salary** and wanting to go on a foreign trip at the company's expense.

If you happen to look at **Research**, I believe we are a laughing stock. By the way, people in India take up research, just to become Head of Department or Principal of a college. The current guides who are supervising research don't understand the fundamental difference between "**Qualitative & Quantitative research**". The only guiding principle in conducting research is 'Novelty'. Nothing can be more naive than this understanding of the research.

“ The last director of ADA Sri Cmde CD Balaji after hanging his boots at ADA has become Chairman for Center of excellence in aerospace and defence, that trains young engineers through a design life cycle of aircraft, such facility is not available within the country

”

Those who want to negate my argument should look at the publishing done by **research scholars** and the number of citations that these publications get. Citations can be a tricky issue as institutions, colleges have issued a strict advisory to, **refer** to their colleague's and their own papers to increase the citation count.

Doing good research and producing cutting edge technology is really a nightmare in India. Some institutions that have defied the ground conditions, again and again, are **DRDO, ISRO and DAE**.

There are many technologies that India has mastered in the area of **Defense**, the most notable among it is the technology to build '**Combat Aircraft**'. I have also heard verbally from **Sri PS Subramanyam**, former director of ADA that LCA-Tejas program is the most expensive program taken by India.

I still have vivid memories of a seminar that I attended in the year 2003 at the **Administrative Staff College of India**, given by **Dr Kota Harinarayana**, the father of LCA-Tejas. Throughout the seminar Dr.Harinarayana was emphasizing on how an LCA could help in bringing high technology to Indian industry and how it could necessitate the need for producing good research in the country. The senior babus at the seminar missed this message and had chided him for doing a futile exercise and **wasting** the country's money when something better is available from Russians.

His successors at ADA were equally charismatic, I was very much impressed when I read an article about Sri PS Subramanyam which mentioned that, he was working **throughout the year** including on Sundays and holidays during his tenure as director of ADA, which was for about **10 years**.

“ Nothing can be more inspirational for the nation on scientific and engineering side.

”

Sometimes these people had to work outside the country to get **requisite technology** to the country, whereas the universities should have done this job. I have seen many scientists at DRDO, who, even after retirement are working on full throttle. I have seen them taking teaching positions, encouraging Startups and motivating young people. All the former directors of ADA are in this group. The last director of ADA **Sri Cmde CD Balaji** after hanging his boots at ADA has become Chairman for **Center of excellence in aerospace and defence**, that trains young engineers through a design life cycle of aircraft, such facility is not available within the country[3].

Finally, I had gone through the blog of the author who was very critical of Indian aeronautical program, I couldn't believe myself when I read " As an effort to **kill time** one fine day I decided to write a science column, more for my **personal amusement** than to attract readers"[4]. This is nothing but a debauch activity for science, for science is not for amusement nor does it intend to attract people.

It is an 'undetermined system', which has fewer equations and more unknowns. In the development of **Tejas**, everything is unknown. If you happen to speak to developers of Tejas, all they have is uncertainty and only uncertainty. Yet they have crafted an aircraft that is best suited to **Indian Conditions** (Interest shown by some countries in the aircraft is a testimony of its technical prowess). In the words of security analyst **Bharat Karnad**, "Tejas has been flying without a single incident – a record unsurpassed by any combat aircraft under development, anywhere any time"[5]. Nothing can be more inspirational for the nation on scientific and engineering side. Tejas proves a point to the world that Indians can take up **complex engineering** feat, and this message must be shown in everything that we take up viz. in terms of software, aerospace, engineering etc.

Finally, developers of Tejas can be seen as best icons for scientists, engineers & technologists, and yet want to remain out of the limelight.

Note:

1. The views expressed here are those of the author and do not necessarily represent or reflect the views of PGurus.

<https://www.pgurus.com/while-we-must-welcome-rafale-ada-drdo-iits-hal-must-be-appreciated/>

THE ECONOMIC TIMES
WWW.ECONOMICTIMES.COM

Fri, 18 Oct 2019

Bengaluru to be backbone for Gripen offering to IAF: Saab

Swedish defence major Saab responded to the initial tender by the IAF for its Multi Role Fighter Aircraft in July 2018 with its Gripen E MRFA. Saab's Ola Rignell said on Thursday that Bengaluru will be the "backbone" for the Gripen aircrafts

Bengaluru: The country head of Saab India Technologies Ola Rignell said on Thursday Bengaluru will be the "backbone" for the Gripen aircraft offering to the Indian Air Force due to the industry set-up here.

Swedish defence major Saab had earlier said it is planning to hold meetings with Indian companies in October to develop ecosystem in the country for manufacturing multi-role fighter aircraft.

Saab is in the fray for a contract to supply 114 fighter planes to India under the Multi Role Fighter Aircraft (MRFA) programme.

The Indian Air Force in April 2018 issued an initial tender or Request for Information (RFI) for the billion dollar procurement deal.

Saab responded to the initial tender in July 2018 with its Gripen E MRFA.

Mats Palmberg, VP Industrial Partnerships and Head of Gripen India Campaign, told PTI earlier that the company has undertaken surveys for aerostructures parts, such as subassemblies, machined parts and sheet metal parts.

Addressing a press conference here on Thursday, Rignell said: "What we have seen so far is that here in India, there are a lot of companies which are competitive, that we can utilise in the fighter programme for India."

"And I would like to emphasise that we foresee Bengaluru, to be the backbone for the Gripen offering to the Indian Air Force because of the industry set-up that they have in Bengaluru," Rignell added.

The company had a 10-day road show in Bengaluru starting from October nine where it had discussions with some 12 companies based out the city.

Having set up a small office in Bengaluru, the Swedish company has been meeting a few firms, including state-owned Hindustan Aeronautics Limited, on the helicopter programme.

Rignell, however, declined to disclose the names of the companies as it is yet to sign the non-disclosure agreement and then an MOU.

He said these agreements are similar to the deals announced earlier with Sansera Engineering, Aequs and Dynamatic Technologies.

Speaking about SAAB's offer to the IAF, Rignell said the current RFI from the IAF stipulates 114 aircraft.

Of these, 18 are supposed to be in a flyaway condition from OEMs (Original Equipment Manufacturers) and the rest to be built in India.

Rignell said, "We are 100 per cent committed to build all 96 (aircraft) in India, from scratch."

<https://economictimes.indiatimes.com/news/defence/bengaluru-to-be-backbone-for-gripen-offering-to-iaf-saab/articleshow/71642838.cms>

THE ECONOMIC TIMES

Fri, 18 Oct 2019

View: African islands in the Indian Ocean- looking beyond Delhi's strategic blindness

The western Indian Ocean continues to remain at the periphery of India's strategic calculations while remaining a blindspot for the Indian Navy despite the region marked as an area of interest in its 2015 maritime security strategy

By Darshana M. Barua

Despite the recent high level visits to the region - Vice President Venkaiah Naidu to Comoros in October 2019, President Ram Nath Kovind visited Madagascar in March 2018- the western Indian Ocean continues to remain at the periphery of India's strategic calculations. It is also a blindspot for the Indian Navy with limited presence and engagements despite the region marked as a primary area of interest in its 2015 maritime security strategy. Interestingly, it is not just Delhi but most of its partners - except France (traditional power) and now increasingly China (new rising power)- have overlooked the importance of this region.

The Western Indian Ocean (WIO) is a strategic sub-theatre of the Indian Ocean linking the Southeastern coast of Africa to the wider Indian Ocean and beyond. It is home to one of the key chokepoints in the Indian Ocean- the Mozambique Channel. While Comoros sits at the northern mouth of the Mozambique Channel, Madagascar borders the channel to its west. While the channel lost its significance post the opening of the Suez Canal, the recent hostilities near the Strait of Hormuz brought the channel back into focus as the original route for bigger commercial vessels (especially for oil tankers). Additionally, the growing importance of Africa in Indo-Pacific engagements combined

with potential natural gas reserves in the Mozambique Channel will only continue to raise the significance of this region in wider maritime security. Keeping in mind the importance of geography for maritime power projection and naval dominance, there is little doubt about the rising significance of the islands in a new geo-political environment in the Indian Ocean. For India, engagements with this region will become critical as the Navy begins to strengthen its presence under its mission based deployments. Engagements with the region, especially with the islands given their geo-strategic location- could become key in supporting Indian naval presence as well as furthering Delhi's Indian Ocean engagement.

However, the foreign policy architects in New Delhi have failed to realise the geo-strategic importance of this region. The Indian Ocean Region (IOR) division in the Ministry of External Affairs (MEA) created under Modi led government in its first term is tasked with coordination of India's engagements with the Indian Ocean islands and the region at large. However, Delhi left behind a critical sub-region- the Western Indian Ocean and the islands of Madagascar and Comoros while formulating an Indian Ocean vision. Its failure to include Madagascar and Comoros, the other two sovereign islands in the Indian Ocean reflects the lack of an actual coherent strategy for the Indian Ocean at large. Instead of perceiving the reality of Madagascar and Comoros as island nations, the MEA perceives the islands through a continental perspective with coordination through the East and South Africa division along with other continental African states. On the other hand, the neighbouring islands of Mauritius and Seychelles are part of the IOR division and are perceived as maritime neighbours. All four islands (Mauritius, Seychelles, Madagascar and Comoros) are members of the Indian Ocean Commission and the African Union, i.e. they belong to the same geographic location.

New power dynamics There is no doubt that the political and economic environment in Madagascar and Comoros differ from its neighbouring Indian Ocean islands. The islands of the Mozambique Channel have suffered from long drawn internal political crisis leading to serious economic issues. However, as with most nations across the Indo-Pacific, Madagascar and Comoros too are waking up to the importance of maritime security in great power politics. There is a renewed enthusiasm within Madagascar's political class in rebranding its foreign policy engagements through the maritime lens. The newly elected government of President Andre Rajaolina seems to send one message out- it is time the Malagasy people turn to the ocean to solve both its economic issues as well claim its position as an island nation in a geo-strategic location. Similar sentiments exist in Comoros.

Building on its key location, the island nations are looking towards its blue economy potential and strengthening its maritime capabilities. While France has been the dominant player in the region and a traditional partner for collaborations, the islands are enthusiastically looking East, toward Asia, to help build its maritime role. Whether it be training for its officers, building ports, acquiring new assets or enhancing its capabilities to monitor its coastal waters, Madagascar and Comoros are enthusiastic in building a maritime relationship with Asian countries. The islands nations are keen to expand its partnerships beyond European nations and are particularly looking to India and China as the new rising powers in the Indian Ocean region. Along with India and China, the islands are keen to strengthen their relationship with Japan, Australia and the US. However, China appears to be the only new actor responding to the islands interests in extending collaborations through military training, infrastructure construction and financial assistance among other initiatives.

India in the Western Indian Ocean As Madagascar and Comoros look East to build its maritime capabilities, India should play an active role in building the maritime capacities of the islands. Delhi has already begun significant new initiatives with the neighbouring islands of the IOR. It must now look beyond Seychelles and extend these initiatives to Madagascar and Comoros integrating the Indian Ocean region as one theatre in its policy engagements. For example, first, India must extend its Coastal Surveillance Radar Network to these islands under its capacity building efforts as well as maritime domain awareness collaborations.

Second, as India continues to deploy its P-8i to Seychelles and neighbouring islands, it must sign a similar agreement with Madagascar and Comoros to help patrol and monitor the waters around the island's significant Exclusive Economic Zone.

Third, Delhi must consider placing a defence attache in one of the islands in the Mozambique Channel to monitor and understand security developments in the region.

Finally, Delhi must respond to the interests of the islands in having an Indian presence in the region through the Indian Ocean Commission (IOC). Despite the IOR being the Indian Navy's primary area of responsibility, Delhi has no formal engagement with this regional institution whereas China holds an observer status. Extending Delhi's network of maritime initiatives to Madagascar and Comoros would only strengthen India's own outlined priorities and interests in the region. In the Indian Ocean, Delhi must be able to understand its own advantages and significance of geography as it continues to place greater importance in the affairs of the region.

(The writer is Visiting fellow, Sasakawa Peace Foundation and Nonresident scholar, Carnegie Endowment for International Peace.)

<https://economictimes.indiatimes.com/news/defence/view-african-islands-in-the-indian-ocean-looking-beyond-delhis-strategic-blindness/articleshow/71627802.cms>



Fri, 18 Oct 2019

Untold saga of Stuxnet

The virus, aimed at disrupting Iran's N-programme, opened world to cyber warfare

By Niraj Srivastava Former ambassador

Stuxnet is well known, at least in the strategic community, as the computer virus that caused damage to Iran's nuclear programme. Its existence was announced to the world in 2010 by software engineers, when they found that it had spread to hundreds of thousands of computers using the Microsoft Windows operating system all over the world, including India. While Stuxnet's structure, and how it damaged the nuclear programme, are by now known, what was not known till a few weeks ago was exactly how it was introduced into the software running Iran's nuclear plant at Natanz.

That story was published by Yahoo News on September 2, and was quickly picked up by many news outlets, and retold, all over the world. Indian media seems to have missed it.

The story provides insights into the operations of the intelligence agencies of the five countries which collaborated to produce the virus and infect the software running the centrifuges at Natanz. Centrifuges are machines used to 'enrich' uranium, which can then be used for various purposes. The operation was primarily a US-Israel enterprise, which also involved the Netherlands, Germany and France. The operation's codename was 'Olympic Games', after the five-ring symbol of the Olympics.

The Natanz plant was 'air-gapped', meaning it was not connected to the Internet. Its centrifuges were run by a software produced by German company Siemens. To infect the software, someone had to physically insert a USB flash drive containing the virus into the computers at Natanz. That was not an easy task, given that the facility was heavily guarded.



Sometime in 2004, the CIA and Mossad (US and Israeli intelligence agencies) requested their Dutch counterpart AVID to locate an Iranian who could be groomed for the job. AVID was able to find one from the expatriate Iranian community in Holland. He was an engineer and had previously been a contractor at Natanz. He was offered a substantial amount of money and resettlement in the West.

The Iranian 'mole' returned home in 2006 and set up a front company providing maintenance services for computers. The company was able to obtain a contract for maintenance work at Natanz, enabling the mole to gain access to the facility in 2007. He paid several visits to the plant during which he gathered information about the centrifuges, which was used to fine-tune the virus in the US. Its use was authorised by President Bush in 2007.

In 2007, the mole took Stuxnet in a USB flash drive and inserted it into the computers. That was his last visit to the facility. The 'air-gap' had been closed.

In the meantime, the designers of Stuxnet had been working to make it more potent. They produced a modified version which was injected into the computers in early 2010, with authorisation by President Obama, who was assured that it would not affect computers outside Iran. This time, they did not need a mole; they could do their work online. This version of Stuxnet was indeed more potent: it blew up around 1,000 of Natanz's 5,000 centrifuges. The Iranians were shocked.

Around the same time, three Iranian nuclear scientists were assassinated in separate incidents in Tehran. It was widely believed that Mossad was responsible for the killings.

But the Iranians were not the only ones to be shocked. This version of Stuxnet spread all over the world, including the US and India, though it did not cause much damage. It was then isolated and analysed by computer experts. In June 2010, they announced its existence to the world. It was the first cyber weapon of mass destruction. One former head of the CIA compared it to the atom bombs dropped on Hiroshima and Nagasaki in 1945.

After Stuxnet was made public, Iran reportedly arrested and executed several workers at Natanz. It is not known if the Dutch mole was one of them.

There is also a geopolitical dimension to the story, involving the rogue activities of AQ Khan, the Pakistani national hero. Khan stole the blueprints of the centrifuges in the 1970s while working at URENCO, a company in Holland. Later, with the approval of the Pakistani establishment, he sold them to Iran and Libya. The Natanz centrifuges were based on the stolen blueprints. His activities came to light in 2004, when the US presented a dossier on him to General Musharraf, the then military dictator of Pakistan. Though Musharraf claimed Khan was acting on his own, very few believed him.

The launch of Stuxnet by the CIA and its partners had several unintended consequences. First, it galvanised Iran into setting up one of the largest cyber warfare units in the world. Second, the US established a Cyber Command for offensive and defensive operations. Third, it alerted all countries to the dangers of a cyber attack. Some of them, including India, took steps to set up their own cyber defence/warfare units. Fourth, it highlighted the need for a multilateral agreement to regulate the use of cyber weapons. That has not happened so far; cyber space is still a free-for-all. Finally, it demonstrated that isolating a computer network from the Internet is no guarantee that it could not be infected by malware. A mole can do the job.

The saga of Stuxnet shows the recklessness of the countries involved in the operation. But they might have unwittingly done a favour to the world by alerting it to the dangers of cyber warfare. For a country like India, Stuxnet was a wake-up call.

There is something else India needs to note. Pakistan gave the centrifuge blueprints to Iran even though it is Shia, while Pakistan is Sunni. It means that Pakistan would not mind Iran acquiring nuclear capability. That suggests their ties are close, despite occasional incidents.

<https://www.tribuneindia.com/news/untold-saga-of-stuxnet/848611.html>

In a first, IAF jets to take part in Oman drill

The last exercise, Eastern Bridge-IV was held in 2017 at Jamnagar

New Delhi: For the first time, the Indian Air Force (IAF) is sending its MiG 29 aircraft to an international exercise.

Indian Air Force is participating in a bilateral joint exercise with Royal Air Force Oman (RAFO) "Eastern Bridge-V" scheduled from 17-26 October at Air Force Base Masirah.

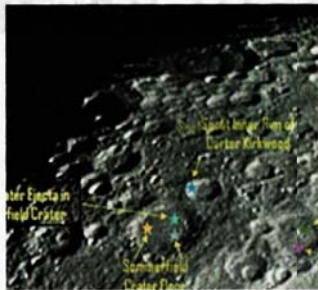
IAF contingent comprises of MiG-29 and C-17 aircraft. MiG-29 will be exercising with Royal Air Force Oman's Euro-fighter Typhoon, F-16 and Hawk. The exercise will enhance inter-operability during mutual operations between the two Air Forces and will provide an opportunity to learn from each other's best practices.

The last exercise, Eastern Bridge-IV was held in 2017 at Jamnagar. "The participation of Indian Air Force in the exercise will also promote professional interaction, exchange of experience and operational knowledge," said a senior IAF official.

<https://www.asianage.com/india/all-india/181019/in-a-first-iaf-jets-to-take-part-in-oman-drill.html>

MAIL TODAY

Chandrayaan-2 orbiter clicks shining Moon



The Moon captured by the Chandrayaan-2 orbiter.

THE Chandrayaan-2 orbiter has begun yet another experiment as it continues conducting its varied studies and tests to better understand the Moon.

Using its onboard imaging spectrometer, the Chandrayaan-2 orbiter captured an illuminated image of the Moon and measured the variation in the sunlight that is reflected by the Moon's surface, the Indian Space Research Organisation in its latest mission

update. This will help the Chandrayaan-2 orbiter better understand the composition of the Moon's surface and, ultimately, its origin and evolution. Confused? Let us explain.

The Moon is not a source of light. That is, the Moon does not emit its own light. What it does is reflect the sunlight that hits the lunar surface. Now, there are variations in the sunlight that is reflected off the Moon's surface.

The Indian Space Research Organisation explains that these variations are due the composition of minerals on the Moon's surface.

In simpler terms, a particular area of the Moon that is rich in a certain mineral will reflect sunlight differently than another area that is rich in some other mineral. And so, measuring the variations in the reflected sunlight can give us an insight into the composition

of the Moon's surface.

Combined with the other Chandrayaan-2 experiments — mapping the lunar surface, identifying the elements presence on the lunar surface, among others — these findings will go a long way in enhancing our understanding of the Moon, its origin and how it has evolved over the years. The Chandrayaan-2 orbiter is part of the ambitious Chandrayaan-2 mission. —www.indiatoday.in