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Sun, 17 Sept, 2017

(Online)

DRDO develops trawl system to locate landmines

Bhubaneswar: Defence Research and Development Organisation (DRDO) has developed a mine clearing trawl system for the minefield area in the battle zone to meet the operational requirements of Indian Army. The trawl system designed by Research and Development Establishment (Engineers), a premier system engineering laboratory under Armament and Combat Engineering (ACE), achieved a major milestone with the successful completion of blast trials recently.

The trials were conducted in collaboration with Pune-based High Energy Materials Research Laboratory (HEMRL) and demonstrated the survivability of the equipment, when subjected to successive series of blasts directly underneath the system. The equipment consists of trawl roller, track width mine plough and electro-magnetic device, which cater to the need of all types of mines usually encountered by the battle tanks in war scenario.

The indigenously developed trawl system will help in breaching of landmines and creating a vehicle-safe lane through a minefield for the advancing columns of mechanised forces in combat zone. A defence official said the trawl system is capable of breaching a variety of landmines, including passive and active influence mines. “The field-able prototype of the system is in final stage of realisation and would be shortly ready for conduct of user evaluation trials by the Army,” he said. It is an important step towards achieving self-reliance in area of critical military equipment under ‘Make in India’ initiative and would result in saving of precious foreign exchange for the country, the official added.



Sat, 16 Sept, 2017

(Online)

Scorpene submarines to get Indian AIP modules

By Dinakar Peri

DRDO’s development of the indigenous system has been delayed

Even as the Navy gets ready to induct its first conventional submarine in almost two decades, sources have confirmed that a decision has been reached on an expensive and time consuming process to install Air Independent Propulsion (AIP) modules on the six new Scorpene submarines to be inducted over the next few years.

However, it is contingent on the indigenous AIP module being fully ready by then.

“All six Scorpenes will get an Indian AIP. It will be installed by the Original Equipment Manufacturer, Naval Group,” a Navy source confirmed.

An AIP module is under development by the Defence Research and Development Organisation (DRDO). It was supposed to have been installed on the last two submarines before they rolled out of the production line. However, the module did not materialise due to delays in development.

As reported by *The Hindu* earlier, Naval Group, formerly the DCNS — a defence company based in France — proposed this option after attempts to install the domestic system on the last two submarines failed.

AIP modules give stealth and extended endurance to diesel-electric submarines by allowing them to stay submerged longer.

However, it would be a costly process as the hull of the submarine has to be opened up to integrate the AIP module and then sealed before being put through the entire range of tests and trials to validate its performance.

The first Scorpene submarine *Kulvari* has completed all trials and is ready for induction either by this month-end or early next month. It would go for a normal refit after six years, in 2023.

The DRDO has assured that the system will be fully ready by then for integration, the source added.

The second submarine *Khanderi* has begun trials, and is likely to be inducted early next year.



Mon, 18 Sept, 2017

First Scorpene Submarine, INS Kalvari, Likely To Be Commissioned By Prime Minister Modi Next Month

Prime Minister Narendra Modi is likely to commission INS Kalvari, the first of six Scorpene submarines being built in India by Mazagon Dock in collaboration with French shipbuilder Naval Group, *Business Standard* has reported.

According to the report, INS Kalvari will likely be handed over to the Indian Navy by September-end. It will reportedly be the stealthiest diesel-electric attack boat in service and will take the number of submarines in the Indian Navy to 14. In view of increasing Chinese activity in the Indian Ocean, the navy needs at least 24 to 26 submarines to effectively monitor the region.

The Indian Navy was supposed to get all six submarines between 2012 and 2015, but delays have pushed induction five years behind schedule. INS Khanderi, the second Scorpene submarine, was launched in Mumbai in January 2017. It is currently undergoing trials and will likely be delivered in March 2018. The remaining four boats will be delivered at nine-month intervals.

The submarines will be commissioned without their primary weapon system, the Black Shark torpedo. Last June, the Defence Ministry had deferred a \$200-million deal for the Black Shark heavyweight torpedoes, built by Whitehead Alenia Sistemi Subacquei, a subsidiary of Italian arms manufacturer Finmeccanica, due to corruption allegations involving Finmeccanica subsidiary AgustaWestland.

THE ASIAN AGE

Mon, 18 Sept, 2017

MiG eyes deal to supply jets to Navy

Company to submit proposal to govt for joint development of aircraft

Eyeing a multi-billion dollar contract from the Indian Navy for the supply of fighter aircraft, Russian military aviation firm MiG today said it was not averse to the transfer of technology and joint development of MiG-29 K jets with Indian companies. MiG CEO Ilya Tarasenko said his company would submit a detailed proposal to the Indian government shortly, detailing its readiness for the joint development of aircraft for the Navy to deepen its already close engagement with India.

"We are considering various options for long-term and prospective cooperation, including those within the framework of the Make in India programme," Tarasenko told PTI in a written interview.

In January, the Indian Navy had kick-started the process of procuring 57 multi-role combat aircraft for its carriers by issuing a Request for Information (RFI) to leading military jet makers.

Currently, six planes are compatible for the aircraft carrier -- Rafale (Dassault, France), F-18 Super Hornet (Boeing, US), MIG-29K (Russia), F-35B and F-35C (Lockheed Martin, US) and Gripen (Saab, Sweden). While F-18, Rafale and MIG-29K are twin-engine jets, the other three have a single engine.

Tarasenko said MiG had been working with Indian defence forces for more than 50 years, delivering planes and providing service.

He said the company was eager to further strengthen its relationship with India.

Russia has been one of India's key suppliers of arms and ammunition. Then Defence Minister Arun Jaitley had visited Russia in June during which the issue of transfer of technology and joint development of high-end military platforms and weapons systems were discussed at length.

Hard-selling MiG-29K as the best option for the Indian Navy, Tarasenko said a fleet of the aircraft had operated from Russian aircraft carrier Admiral Kuznetsov as part of its operations in Syria recently and showed excellent results, including in striking ground targets.



Mon, 18 Sept, 2017

State of Play - Putting Up a Great Defence

By Pranab Dhal Samanta

Nirmala Sitharaman has to act on the momentum GoI can't afford to lose

The defence ministry is a story of unfinished business, of big ideas stuck in bigger execution plans. While the appointment of the first 'full-time' woman raksha mantri is a wonderful verse to the beginning of a new chapter, it still doesn't rub the slate clean. On this count, Nirmala Sitharaman has her task cut out, largely because finance minister Arun Jaitley, during his short stint, has given some fresh momentum that GoI can't afford to lose.

Let's start with the tricky issue of what the military calls 'jointness'. Essentially, how can the three services combine at the top, so that there is better, more effective strategic planning and execution.

Joint Pain

This has got stuck on whether to have a single Chief of Defence Staff (CDS) or not. He can be from any of the three forces, but the choice has to be a political decision backed by broad consensus among all political parties.

From that thought flows the plan of reorganising India's armed forces into theatre commands, with the army, navy and air force combining into an effective unit suited for contemporary war, à la US and Chinese forces. But the problem is that the concept of jointness has become hostage to the decision on CDS.

This logjam has to be broken. And the ministry has to untangle this chicken-and-egg situation.

Why can't all new commands be conceived and set up as joint efforts, reflecting the spirit at functional levels? Say, cyber and space commands - areas where India is upgrading its defence capabilities by reorganising and investing in new resources - should be joint commands. They can, in turn, show the way forward.

Better utilisation of defence land is another issue. Last heard, GoI had appointed a high-level committee to look into the subject and suggest ways to improve land productivity. This may include reworking old rules so that corruption around leasing and using of this land can also be addressed effectively.

Any progress on this front can translate into major reforms, given the way land controversies like Adarsh and Sukna have shaken public faith in the matter. Let's not forget defence land is under direct control of the central government.

Then comes the complicated defence procurement piece. While Jaitley as defence minister set the ball rolling on bringing in the Indian private sector into defence production through the Strategic Partnership (SP) model, there are strong indications that the policy is already headed into a bureaucratic quagmire. Four months after the policy was announced, there is still no movement in shortlisting foreign partners for making submarines, fighter aircraft and helicopters in India.

In fact, till now, only the Request for Information (RFI) for submarines has been issued. Since then, it has become a story of repeated consultations with stakeholders, which must head for closure at some point for this to go through. Else, the SP policy runs the risk of ending up in the cold storage as elections draw closer.

The defence sector, along with rail ways, was billed as the biggest gainer from the 'Make in India' initiative.

While the SP policy chugs slowly on the implementation track, there are others like the production of Kamov helicopters in India that have been stuck because Hindustan Aeronautics (HAL), a PSU, has its facilities committed to first build its assembly line of light utility helicopters.

Think Tank

Maybe the time has come to reassess whether India should ask Russia to identify new partners. In any case, GoI wants robust helicopter-building capacities in the private sector. Staying with Russia, Sitharaman has to seal the arrangement of building, repair and overhaul facility in India.

This commitment exists on paper.

But Moscow has been dragging its feet. This is essential for India to address its spares shortage problems with Russian equipment. Until recently, India was in desperate negotiations with Russia to obtain spares for its frontline Sukhoi fighters. But the problem gets bigger with certain older equipment, like the MiGs and old tanks, where Russia has stopped keeping spares as they no longer make them.

That's how the deal for building a joint facility in India to service Indian equipment was struck. But, for obvious reasons, there's less urgency in Moscow, a gap that New Delhi has to make up for, if this strategically important facility has to come up.

On the question of downsizing the army, GoI has moved decisively on the Shekatkar Committee recommendations, accepting some 90-odd suggestions that will take away a lot of the 'flab'. But, here again, the larger strategic objective is right-sizing the forces by improving their teeth-to-tail ratio.

The defence ministry has to close a conversation with the armed forces on how to create new avenues from resources freed up through this exercise, so that combat capabilities get an added edge.

Sitharaman has already moved on improving civil-military relations by institutionalising meetings with the three service chiefs. But she has to show more on the ground by inducting military officials into the defence ministry at various levels. In the end, she will not be judged by what she does as a woman, for women or with women in the armed forces, but by what she does despite being a woman in executing the onerous task of defending the country .

भारत-नेपाल के बीच हुआ संयुक्त सैन्य अभ्यास

काठमांडो, (भाषा): भारत और नेपाल के बीच आतंक निरोध और आपदा प्रबंधन तकनीकों पर केंद्रित संयुक्त सैन्य अभ्यास का आज पश्चिमी नेपाल में समापन हुआ। भारत और नेपाल के बीच बटालियन स्तर का संयुक्त अभ्यास सूर्य किरण

बारहवां यहां रूपनदेही जिले के सालझंडी इलाके में किया गया। दो हफ्ते चले सैन्य अभ्यास के समापन समारोह में भारतीय सेना के लेफ्टिनेंट जनरल जगदीप कुमार शर्मा शामिल हुए।



IIT-Madras' no wear & tear tech to soar GDP

By Kumar Chellappan

Scientists of the Indian Institute of Technology-Madras and National Thermal Power Corporation Ltd, the country's power giant, have succeeded in developing a path breaking and innovative material capable of rejuvenating considerably the country's Gross Domestic Product.

"This innovation will help us to minimise the wear and tear as well as damages caused to components of the machines," Dr Sundara Ramaprabhu, Head, Alternative Energy & Nanotechnology Lab, IIT-Madras who led the team of research scholars in the three-year long research told The Pioneer.

Beilstein Journal of Nanotechnology, an international peer-reviewed journal has published the findings of the IIT-Madras team in its latest issue..

The country losses 4 per cent of its GDP every year because of corrosion, wear and tear, according to Baldev Raj, former director, Indira Gandhi Centre for Atomic Research (IGCAR), Chennai. The nano-lubricant developed by Dr Ramaprabhu and his team will resolve this issue.

Machines get damaged because of continuous friction between its parts. Though lubricant oils are deployed to bring down the friction, they are not that effective and needs replacement quite frequently. What Dr Ramaprabhu and his team did was to change the character of the lubricant oils used in some of the critical components. The NTPC, which was looking forward to means to increase the longevity of its machines and bring down the operational costs had contacted Dr Ramaprabhu with their problems.

Dr Ramaprabhu, an authority on nano materials, studied the normal lubricant oil and decided to make certain alterations in its structure. With the help of Dr Rashmi Chandrabhan Shende, a Nagpur-born physicist, Dr Ramaprabhu converted the normal lubricant oil to nano-lubricant oil. This he did by dispersing nano particles in the lubricant oil with the aid of probe sonicator, a device used to suspend nano particles uniformly in the oil.

The nano-particles were made out of graphene oxide and the nano-lubricant was termed as "nitrogen-doped reduced graphene oxide". "The result we got with nano-lubricant was a pleasant surprise. The coefficient of friction as well the wear and tear got reduced by 20 per cent. The operational temperature fell by

15 per cent when the nano-lubricant was deployed in the Induced Draft Fan, the most crucial component in a power generator,” explained Dr Ramaprabhu.

Velayudhan Pillai Jayan, deputy general manager (research and development) NTPC, who worked with Dr Ramaprabhu, said that it was a dream come true. “We are using nano material in a power generation unit for the first time. The results were simply superb. The operational temperature came down drastically. The wear and tear got reduced and the longevity of the engineering components was considerably increased,” Jayan told The Pioneer over telephone from the Greater Noida laboratories of NETRA (NTPC Energy Technology Research Alliance).

The IDF is the component which sucks out the coal-burnt gas from the boiler of the power unit. “The energy consumption level of the IDF showed remarkable reduction when we used this nano-lubricant oil in place of the routine oil. If this nano-lubricant is deployed in all the 71 units of the NTPC, the operational costs would come down by Rs 40 crore per year,” said Dr Ramaprabhu.

Rashmi Shende said this was the tip of the ice berg. “We can deploy nano-lubricant oil in all systems which use lubricants. The composition may need some alterations,” said Rashmi. Nisha Ranjan, a Ph D scholar will continue the research project for new nano lubricants.

Nano –lubricants may soon replace all kind of lubrication oils in various engineering applications like motor vehicle engines and other mechanical systems. “This is an ongoing research. Right now we have developed nano-lubricants for power generators. More such products are on the anvil,” explained Dr Sundara Ramaprabhu, who had developed nano materials for treating effluent water and purifying polluted river waters. Perhaps he has the solution for cleaning the waters of Ganga. Are you listening, Prime Minister Modi?

Business Standard

Mon, 18 Sept, 2017

Chips Off the Old Block: Computers Are Taking Design Cues From Human Brains

New technologies are testing the limits of computer semiconductors. To deal with that, researchers have gone looking for ideas from nature.

By Cade Metz

San Francisco — We expect a lot from our computers these days. They should talk to us, recognize everything from faces to flowers, and maybe soon do the driving. All this artificial intelligence requires an enormous amount of computing power, stretching the limits of even the most modern machines.

Now, some of the world’s largest tech companies are taking a cue from biology as they respond to these growing demands. They are rethinking the very nature of computers and are building machines that look more like the human brain, where a central brain stem oversees the nervous system and offloads particular tasks — like hearing and seeing — to the surrounding cortex.

After years of stagnation, the computer is evolving again, and this behind-the-scenes migration to a new kind of machine will have broad and lasting implications. It will allow work on artificially intelligent systems to accelerate, so the dream of machines that can navigate the physical world by themselves can one day come true.

This migration could also diminish the power of Intel, the long time giant of chip design and manufacturing, and fundamentally remake the \$335 billion a year semiconductor industry that sits at the heart of all things tech, from the data centres that drive the internet to your iPhone to the virtual reality headsets and flying drones of tomorrow.

“This is an enormous change,” said John Hennessy, the former Stanford University president who wrote an authoritative book on computer design in the mid-1990s and is now a member of the board at Alphabet, Google’s parent company. “The existing approach is out of steam, and people are trying to re-architect the system.”

The existing approach has had a pretty nice run. For about half a century, computer makers have built systems around a single, do-it-all chip — the central processing unit — from a company like Intel, one of the world’s biggest semiconductor makers. That’s what you’ll find in the middle of your own laptop computer or smartphone.

Now, computer engineers are fashioning more complex systems. Rather than funneling all tasks through one beefy chip made by Intel, newer machines are dividing work into tiny pieces and spreading them among vast farms of simpler, specialized chips that consume less power.

Changes inside Google’s giant data centres are a harbinger of what is to come for the rest of the industry. Inside most of Google’s servers, there is still a central processor. But enormous banks of custom-built chips work alongside them, running the computer algorithms that drive speech recognition and other forms of artificial intelligence.

Google reached this point out of necessity. For years, the company had operated the world’s largest computer network — an empire of data centres and cables that stretched from California to Finland to Singapore. But for one Google researcher, it was much too small.

In 2011, Jeff Dean, one of the company’s most celebrated engineers, led a research team that explored the idea of neural networks — essentially computer algorithms that can learn tasks on their own. They could be useful for a number of things, like recognizing the words spoken into smartphones or the faces in a photograph.

In a matter of months, Mr. Dean and his team built a service that could recognize spoken words far more accurately than Google’s existing service. But there was a catch: If the world’s more than one billion phones that operated on Google’s Android software used the new service just three minutes a day, Mr. Dean realized, Google would have to double its data centre capacity in order to support it.

“We need another Google,” Mr. Dean told Urs Hölzle, the Swiss-born computer scientist who oversaw the company’s data centre empire, according to someone who attended the meeting. So Mr. Dean proposed an alternative: Google could build its own computer chip just for running this kind of artificial intelligence.

But what began inside data centres is starting to shift other parts of the tech landscape. Over the next few years, companies like Google, Apple and Samsung will build phones with specialized A.I. chips. Microsoft is designing such a chip specifically for an augmented-reality headset. And everyone from Google to Toyota is building autonomous cars that will need similar chips. ----*The New York Times*