

## **Patentmatics Monthly Bulletin November 2018.**

**Area of Focus: Two magnificent examples of the Self Reliance Era.**



**(a)Arihant launch strengthens nuclear 'triad'**

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**Naval power The launch of INS Arihant has further added nuclear fire-power to Indian defence (file picture) - REUTERS**



**Naval power The launch of INS Arihant has further added nuclear fire-power to Indian defence (file picture) - REUTERS**

**With Pakistan's India-aimed N-doctrine and China's ambiguity, India needs to boost its land, sea and air-based nuclear arsenal**

**Prime Minister Narendra Modi announced with justifiable national pride on November 6, that India's first nuclear propelled submarine, INS Arihant, which was commissioned in 2016, was now operationally ready, as an integral part of its nuclear deterrent.**

**India earlier had the capabilities to launch nuclear weapons from the Air, mounted largely on its Mirage 2000 and Jaguar Aircraft, and by land based missiles, ranging from its Agni 1 missile, with a range 700-900 km, to Agni 5 Missiles, with a range of 5500 km. Its aim has been to develop a "credible nuclear deterrent", with capabilities to deliver nuclear weapons from multiple locations on land, air and sea, to all strategic areas and centres, in its two nuclear-armed neighbours —China and Pakistan.**

**The Arihant provides India with a capability to hit either neighbour from 300 meters under the sea. The sea-based missiles envisaged for this purpose are the Sagarika with a range of 750 km and the K-4, with a range of 3500 km. While land-based missile sites can be attacked and destroyed, a submarine-based**

**deterrent is virtually impregnable against a missile attack. India is the only country having a sea-based nuclear deterrent, which is not a Permanent Member of the UN Security Council.**

**India will soon operationalise a second nuclear submarine the “Arighat” and is expected to have a fleet of four such submarines by 2022. According to US Federation of Nuclear Scientists, India currently possesses 130-140 nuclear weapons, while Pakistan has 140-150 and China 280. While India tested its first nuclear weapons in 1998, Pakistan’s first weapons test was in 1990, on Chinese soil.**

### **The China hand**

**In a recent book he authored, Thomas Reed, an American nuclear weapons designer and former Secretary of the US Air Force, stated that China’s “Pakistan Nuclear connection”, can be explained in the the following words: “India was China’s enemy and Pakistan was India’s enemy. The Chinese did a massive training of Pakistani scientists, brought them to China for lectures, even gave them the design of the CHIC-4 device, which was a weapon that was easy to build-a model for export.”**

**Gary Milhollin, another American expert, remarked: “Without China’s help, Pakistan’s bomb would not exist”. China has also provided Pakistan the designs of its nuclear weapons, upgraded its “inverters” for producing enriched uranium in Kahuta and provided it with Plutonium reactors and separation facilities, for building tactical nuclear weapons in Khushab and Fatehjang. Pakistan’s ballistic and Cruise Missiles are replicas of Chinese missiles.**

**India’s nuclear doctrine stated that its nuclear weapons would only be used in retaliation against a major attack on Indian territory, or on Indian forces anywhere, in which nuclear weapons are used. India also retains the right to use nuclear weapons in the event of major attacks on its territory, or on Indian forces anywhere, in which chemical or biological weapons are used. Pakistan, on the other hand does not have a formal nuclear doctrine.**

The long time Head of Pakistan's Nuclear Command Authority, Lt. General Khalid Kidwai, however, mentioned over a decade ago, that Pakistan's nuclear weapons were "aimed solely at India". He added that Pakistan would use nuclear weapons if India conquers a large part of Pakistan's territory, or destroys a large part of Pakistan's land and air forces.

Kidwai also held out the possibility of use of nuclear weapons if India tries to "economically strangle" Pakistan, or pushes it to political destabilisation. Pakistan's statements in recent years have, however, indicated that it would not be averse to using tactical nuclear weapons in a conventional conflict with India.

China, like India, also had proclaimed that it would not be the first to use nuclear weapons. But China has maintained a measure of ambiguity on whether its "no first use" pledge will be applicable to India. This became evident when China's Foreign Ministry spokesman on July 29, 2004 rejected a suggestion from then Indian External Affairs Minister Natwar Singh that both countries should adopt a "common nuclear doctrine".

Subsequent discussions between Indian and Chinese experts have suggested that China maintains deliberate ambiguity on its nuclear doctrine, when it comes to dealing with India. Many legitimately ask whether this is meant to signal to Pakistan that China will come to its aid in any nuclear exchange Pakistan has with India, even if it is initiated by Pakistan. This Chinese ambiguity only adds to India's determination to strengthen its "Triad" of land, air and sea-based nuclear weapons.

India's Agni 5 missiles can target China's populous East Coast. Within the next four years, we would also have an adequate sea-based deterrent to deter China from holding out credible nuclear assurances to Pakistan that it would intervene should India choose to respond to use, or threats of use, of tactical nuclear weapons by Pakistan.

**Bureaucratic morass**

**While India has a well-organised, streamlined nuclear command structure headed by the Prime Minister and Cabinet Committee on Security, it needs to address serious issues on the archaic structure of its Ministry of Defence. Most importantly, the key military figure in the Nuclear Command structure is the Chairman of the Joint Chiefs of Staff Committee, who generally holds office for less than a year. This is hardly the time adequate for him to become fully familiar the complexities of our Strategic Nuclear Command.**

**Sadly, repeated proposals including from high level Defence Committees and Task Forces, recommending appointment of a full time “Chief or Defence Staff”, or “Chairman Chiefs of Staff Committee”, who will hold charge of the Nuclear “Strategic Forces Command” and report to the political authority, have gathered dust for years in the offices of the generalist bureaucracy of the Defence Ministry.**

**The present set up of the Defence Ministry needs to be drastically reorganised. Recommendations for such change even from the Parliament Standing Committee of Defence lie unimplemented. We recently acquired our desperately needed first batch of artillery guns, after the Bofors controversy broke in the 1980s. This happened even as the full and detailed designs for 155 mm. Howitzers provided by Sweden, were gathering dust in the offices of the Defence bureaucracy, for two decades. There is also surely something wrong if it takes more than a decade to acquire new fighter aircraft, even as we are today facing a shortage of around 30 per cent in the sanctioned strength of our Air Force.**

***The writer is former High Commissioner of Pakistan***

**(b) After textbook debut, GSLV Mark-III ready for moon**

**M RAMESH**



After the successful launch of the GSLV Mk III-D2/GSAT-29 Mission which put GSAT 29 into orbit with the Chairman ISRO K.Sivan at Satish Dhawan Space Centre at Sriharikota on Wednesday 14th November. - K. Pichumani/ The Hindu

## **Deploys GSAT-29 telecommunications satellite successfully into space**

**SRIHARIKOTA (AP), NOV 14**

The GSLV Mark-III, the heaviest rocket ever launched from the Indian soil, soared majestically heavenward, its orange plume lighting up the evening sky above the Sriharikota rocket launch station, at the southern coastal border of Andhra Pradesh.

The launch was, in the words of Mission Director B Jayakumar, a “grand success”. In its head, the ₹300-crore 640-tonne big-boy carried the 3.4-tonne GSAT-29, a telecommunications satellite.

The GSLV Mark-III, with its two strap-on motors, stood like a mother with her twins on either side, with anxious rocket-men waiting for the countdown. At precisely 5 pm, the 43.49-m giant shook off its moorings at the second launch pad at Sriharikota in a massive ball of fire and began its 17-minute journey into the heavens. When it reached a height of 207.57 km, exactly 16 minutes and 43 seconds after it blasted off, the rocket ejected the GSAT-29. When it emerged, the satellite was travelling at 10 km a second — at that speed, it would have covered the distance between Delhi and Mumbai in less than two-and-a-half minutes.

**Knowledge, self-acquired**

The satellite will eventually be manoeuvred to round the Earth in an elliptical path —coming as close to the Earth as 190 km and turning back towards the planet when it reaches 35,975 km. However, no matter where it is, the satellite will be above India to receive and send back communications signals. As rockets go, the Mark-III is but a dwarf compared with its developed-country peers. (The Saturn V, which took the first men to the Moon was nearly three times taller than Mark-III) But India’s state-owned space agency, ISRO, feels a sense of achievement because its knowledge of rocket science is largely self-acquired, on a shoe-string budget.

The significance of the Mark-III is that it considerably reduces India’s dependence on foreign launchers for taking up its heavy satellites. Now that the two developmental launches of the Mark- III have been completed (the first was in June, 2017), the rocket has been declared fit for operational runs, the first of which is likely to be in January, for the Chandrayaan-2 moon mission.

If the rocket is significant for its muscle, satellite GSAT-29 is equally heady. If its transponders are to serve remote regions of Jammu & Kashmir and the North-East, it also features three hi-tech gadgets — a Q/V-Band communications payload, an optical communication payload and a high resolution camera. All the three are demonstration gadgets. The first two are used mainly for inter-satellite and space-to-space communications.

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