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सेना को मिलेगी 52 कैलीबर क्षमता वाली शक्तिशाली तोप 'धनुष-2'

जागरण संवाददाता, कानपुर : देश की सेना को एक और शक्तिशाली तोप जल्द मिलेगी। यह धनुष का ही उन्नत वर्जन होगी। सेना, आयुध निर्माणी बोर्ड व डायरेक्ट्रेट जनरल क्वालिटी एश्योरेंस ने मिलकर अब 'धनुष-2' के निर्माण पर काम शुरू कर दिया है। यह मौजूदा तोप 'धनुष' से चार किलोमीटर और अधिक दूरी तक मार करने की क्षमता रखेगी। अब इसका आंतरिक ट्रायल पूरा हो चुका है।

2014 से बोफोर्स तोप को और विकसित करके 'धनुष' तोप पहले से बनाई जा रही है। इसका निर्माण आयुध निर्माणी कानपुर, फील्ड गन फैक्ट्री व गन कैरिज फैक्ट्री जबलपुर संयुक्त रूप से किया है। इस तोप की मारक क्षमता लगभग 38 किलोमीटर है। इसके बाद अब सेना के पास 42 किलोमीटर दूरी तक मार करने

वाली आधुनिक तोप होगी। महीने भर पहले ही आयुध निर्माणी कानपुर द्वारा तैयार 'धनुष-2' तोप की बैरल को आंतरिक ट्रायल के लिए बालासोर (ओडिशा) भेजा गया था, जिसे चार दिन तक चले परीक्षण में सफलता मिली है। बहुत जल्द यह सेना के परीक्षण से भी गुजरेगी। आयुध निर्माणी बोर्ड के निर्देशानुसार इसका उत्पादन तीनों आर्डिनेंस फैक्ट्रियों में करवा जाएगा। ओएफबी के चेयरमैन वेदप्रकाश यजुर्वेदी ने बताया कि 'धनुष-2' बेहद ताकतवर तोप होगी। यह धनुष से भी अधिक तेज होगी। इस दिशा में बोर्ड ने काम शुरू कर दिया है।

ऑटोमैटिक मोड में होगा संचालन : 'धनुष-2' 52 कैलीबर की तोप होगी, यह 45 कैलीबर वाली धनुष तोप से सात कैलीबर अधिक क्षमता वाली

साबित होगी। इसे ऑटोमैटिक मोड में संचालित किया जा सकता है। रेट आफ फायर भी इसका जबरदस्त होगा।

414 गन की डिमांड : आयुध निर्माणी कानपुर को 414 तोप बनाने का आर्डर मिल चुका है। इसमें 114 गन की आपूर्ति तत्काल की जानी है। अभी तक छह बैरल सेना को भेजी जा चुकी है, बाकी का उत्पादन तेजी से चल रहा है। सेना की डिमांड के अनुसार अब नई तोप मैकेनिकली और इलेक्ट्रिकली रूप से अपग्रेड मॉडल होगी।

'एंटी माइन बूट' का आर्डर : डिफेंस मटेरियल्स एंड स्टोर्स रिसर्च डेवलेपमेंट इस्टेब्लीसमेंट (डीएमएसआरडीई) और पनकी स्थित एक फैक्ट्री को दो लाख एंटी माइंस बूट बनाने का आर्डर मिला है।



Sat, 28 Jan, 2017

(Online)

How India achieved an important defence milestone with Agni 5 intercontinental ballistic missile – a weapon of peace!

Agni 5 is a Long Range Ballistic Missile indigenously developed by the Defence Research and Development Organization - DRDO, capable of delivering devastating nuclear weapons at targets as far away as 5000 km and beyond.

The dawn on 19th April 2012 created history when the Agni 5 zoomed in the sky. It had precisely followed the predefined ballistic trajectory through space and in a matter of minutes made the payload splash into 'Hind Maha Sagar' at a distance in excess of 5000 kilometres away from the launch pad, with amazing accuracy. The flight was closely monitored throughout its path by land and ship-based sensors, besides possibly by the global powers peeping down through their air and space-based assets.

“MD announces the successful completion of mission A5-01” Dr Avinash Chander, then the Chief Controller R&D- (Missiles & Strategic Systems) and Mission Director-A5-01 mission, had declared with a visible sense of pride and satisfaction. An elated Dr Vijay Kumar Saraswat (then DRDO Chief and presently – member NITI Aayog) had congratulated the team and announced, “We have made a history by successfully launching

A5-01 – Heartiest Congratulations...”. India had achieved the distinction of being among top few nations of the world possessing multi-level strategic deterrence enough to take care of its threat perception.

However, a matter of even greater pride has been the fact that the required technologies had been developed indigenously by our own scientists, that too against innumerable roadblocks laid by the powers that were determined to block India’s progress and re-emergence as a strong nation.

Since then, the world has witnessed India carry out three more test launches on 15th September 2013, 31st January 2015 and 26th December 2016 respectively, the last two being from canisters mounted on road-mobile launch vehicles.

So what is Agni 5 and what makes Agni 5 so special and important?

Agni 5 is a Long Range Ballistic Missile indigenously developed by the Defence Research and Development Organization – DRDO, capable of delivering devastating nuclear weapons at targets as far away as 5000 km and beyond. Advanced technological features packed in Agni 5 make it a state of the art weapon system comparable to best in the world. Some of these features are:

- > Efficient rocket motors driven by composite solid rocket propellants.
- > Second and third stage motors made of advanced, high performance, lightweight fibre reinforced composite materials resulting in very significant weight savings, thus extending the range of the missile.
- > Innovatively designed and aerodynamically shaped third stage ‘Conical Rocket Motor’.
- > Superior re-entry heat shield made of multidimensional carbon-carbon composites ensuring the protection of the payload. When the friction with atmospheric air during reentry into earth’s atmosphere heats up the surfaces to around 5000K, temperatures at that no material is able to withstand, the ablative heat shield ensures that the inside temperatures remain within acceptable limits (about 320K).
- > “On Board Computer” powered by indigenous SoC (System on Chip) along with fault tolerant software. Together these act as the brain of the entire mega ‘system of systems’ – the “Fire and Forget” Agni 5.
- > A robust and reliable Inertial Navigation System (RINS) incorporating very high accuracy Ring Laser Gyro and the most modern Micro Navigation System (MINS) to ensure that payload reach the target point with accuracy within two digits.
- > Innovative systems to ensure clean and reliable separation of different stages ensuring the safety of missile.
- > Road mobile – The ability to launch anytime and from anywhere is force-multiplier. Mobility provides additional security for the asset from enemies.
- > Canister-Launched – Involving yet another set of highly complex technologies, give a mega advantage over open launch. The missile is stored in a hermetically sealed canister providing much longer operational life and better camouflage.

The canister is carried horizontally on a specially designed multi-axle road mobile launcher. When needed, the vehicle is appropriately parked and automated launch sequence initiated. The canister takes a vertical position, the system carries out self-checks and high-pressure gases pop the missile up in the air to a height at which the plume can no longer cause damage to the vehicle and surroundings.

The rockets motor gets fired taking the missile out of earth’s atmosphere into space (A conventional open launch requires additional preparations and checks. The plume spreading to a much larger area necessitates a lot more safety measures).

- > The three stages during the power phase propel the missile into a parabolic trajectory and keep separating at a predetermined sequence, even as earth’s gravity keep pulling it towards earth.

The combination of two forces results in a parabolic trajectory making the payload re-enter earth’s atmosphere and zoom towards the annihilation of its target with terrific and constantly increasing velocity, braving temperatures around 5000K.

What is Strategic Deterrence

To understand strategic deterrence, let's ask ourselves: Had India possessed its own Weapons of Peace during the 1971 war, would it still have to face unethical arm twisting by the threat of 7th fleet?

If Japan during WWII had nuclear weapons and capability to drop them across pacific, would the US still have dared to drop atom bombs on Hiroshima and Nagasaki annihilating two thickly populated cities of Japan and forcing an otherwise determined Japan to surrender unconditionally? "Strategic Deterrence" is "eye for an eye", the "fear of unacceptable retaliation" that prevents any hostile country from considering a misadventure.

Why Agni 5

India, a land of peace-loving people and once a land of unparalleled skills & strength, rich culture & traditions, plentiful opportunities and prosperity became a victim of loot plunder and over a millennium of slavery when it lost attention to its security needs. It is indeed essential to be strong to enjoy the luxury of peace.

Agni 5 is India's bold statement of Strength for Ensuring Peace, a major landmark in India's journey of creating the level of strategic deterrence required commensurate with contemporary threat perception – a deterrence level sufficient to force any adversary to think a million times before unleashing a Hiroshima style nuclear attack on any part of our nation.

Door to More Capabilities – Beyond just Deterrence

The success of Agni 5, unlike its predecessors, makes Agni 5 much more than being a bigger and scarier weapon meant to deter any nuclear misadventure against peace-loving people. Power to scale far greater heights with heavier payload opens doors to many more crucial capabilities such as:

Launch on Demand: Satellites being valuable assets playing vital roles in many ways in modern Network Centric Warfare including "Real-time Situational Awareness" are 'sitting ducks' highly vulnerable to enemy attack (their coordinates at any given time known and their manoeuvrability being very limited).

Capabilities of a platform like Agni 5 having response time far more prompt than conventional launch vehicles can help restore the space-based assets rapidly.

Anti-Satellite Role: Whereas India has remained committed to peaceful use of space for benefit of humankind, the fact that Agni 5 has potential to be modified for Anti-Satellite role with existing technologies (developed by DRDO as part of its indigenous Ballistic Missile Defence program), will provide enough fear of retaliation, acting as potent deterrent against an adversary planning to play funny with our space-based assets. *(This article is authored by Ravi Gupta, a former DRDO scientist)*



Mon, 30 Jan, 2017

US arms for India on China's Trump talk list

By Indrani Bagchi

'Border, Dalai Lama Among Top Beijing Concerns'

US arms sales to India and China-India border disputes are among the top six "sensitivities" senior Chinese officials have listed for the new Donald Trump administration, Michael Pillsbury, senior adviser to the US president, said in a conversation with TOI here.

The US-China relationship in the Trump era will be of critical interest to India, affecting its own grand strategy. Pillsbury, as a China expert and now an adviser to Trump, probably has the clearest view. "Six areas of outsized importance to President Xi Jinping and the ruling elite have been revealed," Pillsbury said.

The Chinese have never openly objected to India's weapons purchases from the US or anyone. The fact that they would do so now is significant. "This and the South Korean missile shield are on their list," he said.

The others are 'One China policy' and Taiwan, again in the area of weapons sales; Dalai Lama and the Tibet government in exile -China has asked that Trump not meet Dalai Lama. China is also nervous about the THAAD (terminal high altitude area defence) missile interceptors and SPY radar systems that the US has agreed to position in South Korea. Pillsbury said they would not like the US to add to these, which could neutralise China's ICBM (intercontinental ballistic missile) capability that targets the US mainland.

"Whether President Trump supports India's claim to Arunachal Pradesh and continues US arms sales to India already requested by PM Modi, now America's largest customer of weapons, is another Chinese worry about the coming year," Pillsbury said at the recent Raisina Dialogue.

But China, Pillsbury said, would ideally like Trump to agree with its denial of the TOI UNCLOS verdict on its South China Sea claims. The new secretary of state, Rex Tillerson, said in his Senate confirmation testimony that the US should even block China's access to the artificial islands.

Speaking exclusively to TOI, Pillsbury said, "The Chinese are optimistic (about Trump.) They think he is a businessman who has clear economic motives to make America great again and they believe they can help."

Two advisers to Trump, Alexander Gray and Peter Navarro, have written what is cited as an important article in the international affairs journal 'Foreign Policy' on Trump's Asia-Pacific policy, which they described as "peace through strength". Pillsbury said, "The piece by Gray and Navarro was officially approved by the Trump campaign. So it's quite important.

Gray and Navarro say Trump will not sacrifice US economy on the altar of foreign policy by getting into trade deals like TPP, and secondly, Trump will rebuild the US military to be unchallenged.

Asked about Trump's possible policy in this region, Pillsbury said he would be "unpredictable. "He wants the Chinese in particular to believe that he is unpredictable. That is his negotiating strategy.

What does he think are China's intentions? He said, "I try to explain it in my book through Chinese defectors and what each of them have said. One of the defectors told us, 'we're following your American strategy. We want to have a Monroe Doctrine in Asia -no other power can come in. We want to steal technology, you Americans did it. You fooled the British and you surpassed them. And the British made no resistance.' They particularly like that that you can fool the ruling power."

"People don't know that Chinese economists forecast in writing that by 2020 they will pass us, for sure, by 2030 they will be double, and by 2049, the end of the marathon, they will be three times the size of the American economy. This is really staggering.

What are the top two scenarios that could play out?

Pillsbury said, "One, if economic reforms succeed and China successfully turns to its internal market for consumption, buys a great deal more American exports. So it's the Make America great again scenario.

The other scenario is President Xi continues to crack down on human rights, corruption and continues to increase military spending and so we do end up with a militarily powerful China in 10 or 15 years. Those are the two leading scenarios. Those are at 30% each. That still leaves 40% unknown.

US-India defence ties on target

If all goes well, the Trump administration will allow co-production of weapons

The most tangible element of the growing strategic convergence between India and the United States over the past two decades has been in defence. The George W. Bush administration began the process by lifting dual-use technology sanctions against India. President Barack Obama saw slow progress, largely because of the American allergies that afflicted the second Manmohan Singh government. But an ambitious Defence Technology and Trade Initiative was started and has since laid out over a half-dozen specific defence production projects that the two countries – and more importantly their individual defence firms – can work on together. The idea was to not only produce, in time, tangible Indo-US joint weapons systems but to also cut paths for such projects through the bureaucratic thickets of the respective defence ministries.

ourtake

The Trump administration has yet to say anything concrete about the Indo-US defence relationship. There are reasons to be positive. The new president has spoken of India in only positive terms, something that has not characterised his language on most parts of the world. The outgoing Obama administration sought to institutionalise what had been accomplished with India in terms of defence cooperation with an amendment to the National Defence Authorisation Act 2017. The amendment fortunately received strong bipartisan support. This was confirmed by the testimony of the new Pentagon Chief, General Jim Mattis, who spoke of the DTTI as having helped the Indo-US defence relationship “grow to the benefit of both countries.”

The future of the defence relationship now rests on the Trump administration moving forward in two areas. One is to reassure the Indian side that the US’s strategic commitment to the rise of India, laid out by the Bush administration, remains embedded in Washington’s new decision-making circle. Without it, India will not trust the US enough to buy Made in America major weapons platforms and the US will not feel comfortable with giving India cutting-edge technology or weapons systems. Two is the willingness of the Trump administration to allow co-development and co-production of weapons with India. President Trump has laid out an economic policy manifesto that emphasises safeguarding domestic manufacturing and raising trade and investment barriers. The question is whether this will also apply to working with India on developing weapons. India will expect continuity in its defence relationship under Trump and hopefully that is what the administration will also accept.

THE ASIAN AGE

Pak shelling causing J&K avalanches: Army chief

As many as 21 people, including 15 soldiers, have been killed since last week because of avalanches.

New Delhi: Global warming and heavy shelling by Pakistani troops are triggering avalanches in Jammu and Kashmir that have claimed the lives of 15 Army men since last week, Army Chief General Bipin Rawat said on Sunday.

“Ceasefire violations and use of heavy weapons by Pakistani troops are leading to loosening of soil. When there is a heavy snowfall on such a loose soil and if there is a slope, it triggers danger of an avalanche,” he told reporters after paying homage to Major Amit Sagar, who lost his life in an avalanche in Sonamarg on January 25. He added that avalanches were being reported from areas which in the past did not have so many incidents.

“Global warming is also leading to cracks in glaciers... There are avalanches in areas which had not reported such cases earlier. Avalanches have occurred in Dawar areas, Machil sectors,” Gen. Rawat said.

As many as 21 people, including 15 soldiers, have been killed since last week because of avalanches and snowfall-related incidents in the Kashmir Valley.

Gen. Rawat said Jammu and Kashmir has been witnessing heavy snowfall over the past 72 hours, and is likely to record similar conditions for the next two-three days.

The Army, he said, has been taking help of the Snow and Avalanche Study Establishment, a laboratory under the Defence Research and Development Organisation (DRDO), to map avalanche-prone areas.

The Army withdraws troops from places at risk of avalanches, but that cannot be always done in positions vulnerable to insurgency.

“In the weather that is prevailing in Jammu and Kashmir, the soldiers have been deployed to counter the terrorists and infiltrators. They are doing their duty despite the adverse conditions,” Gen. Rawat said.

“Major Amit Sagar is an example. He volunteered to serve in the area knowing the difficult conditions,” he added.

The Army Chief said that the bodies of the martyred soldiers are still in Jammu and Kashmir because of the weather conditions, but all efforts are being made to bring them down.

“I want to assure the families of soldiers affected by the avalanche in Jammu and Kashmir that we are with them,” Gen. Rawat said. “Weather is playing a spoilsport in bringing back the bodies of their dear ones,” he added.

Bullet with turn

On February 3, 2016, 10 soldiers from the Madras Regiment’s 19 Battalion went missing in Siachen after an avalanche. Lance Naik Hanumanthappa, 33, was dug out from 30-feet deep snow after he miraculously survived for five days. He later succumbed to his injuries.

In January 2016, four soldiers lost their lives after being hit by an avalanche in Siachen.

In one of the most devastating avalanches, about 135 Pakistani soldiers died after being buried under tonnes of snow when an avalanche hit them near Siachen in April 2012.



Mon, 30 Jan, 2017

India to Focus on BIMSTEC after Hurdles from Pak

By DipanjanRoy Chaudhury

India has decided to focus on strengthening the Bay of Bengal Initiative for MultiSectoral Technical and Economic Cooperation (BIMSTEC) amid Pakistan's continued intransigence in blocking key anti-terror and connectivity initiatives under the South Asian Association for Regional Cooperation or SAARC.

This explains the recent move to club BIMSTEC Division with SAARC in the external affairs ministry , officials said.

Nepal, as the BIMSTEC chair, is scheduled to host the group's summit this year, the first since the Narendra Modi government assumed office in May 2014.

Picking up from where BIMSTEC leaders left during their retreat in Goa last October the bloc is expected to add teeth to their counter-terror partnership. BIMSTEC Convention on Mutual Legal Assistance in Criminal Matters is ready for signature, the grouping's secretary general Sumith Nakandala told ET from Dhaka, which houses its secretariat. Nakandala visited Delhi last week to discuss steps to give momentum to the grouping's functioning.

“BIMSTEC Convention on Cooperation in Combating International Terrorism, Transnational Organised Crime and Illicit Drug Trafficking was signed in 2009. While Bhutan and Nepal are in the process of

ratification, all other member states have ratified it... The BIMSTEC leaders at their retreat emphasised greater cooperation in fighting terrorism," Nakandala said.

A number of meetings are likely to be organised by the grouping in the run-up to the summit, which comes after the one held in Myanmar in March 2014.

The Modi government signalled that strengthening regional cooperation between South and Southeast Asia through BIMSTEC is a priority, choosing the grouping as it did for outreach with BRICS leaders following their summit in Goa.

India as the biggest country in the BIMSTEC is giving special attention to the grouping in the 20th year of its creation. The grouping, which does not include Pakistan, could serve as an alternative to the SAARC to give countries in South Asia a new direction, said a person familiar with the developments.

Although India has strong bilateral counter-terror cooperation with certain BIMSTEC nations Bangladesh, Myanmar, Thailand and Nepal an annual national security adviser level meet for the grouping and launch of a BIMSTEC de-radicalisation initiative are on the cards, said the person, who did not wish to be identified.

BIMSTEC has five members in common with the SAARC India, Sri Lanka, Nepal, Bhutan and Bangladesh while Thailand and Myanmar are the other two members. While no immediate expansion is on the cards there has been speculation about entry of Afghanistan and Maldives in this bloc. "BIMSTEC needs to consolidate the instruments of regional cooperation within itself," Nakandala said.

Pakistan has been blocking connectivity initiatives such as SAARC Motor Vehicles Agreement and SAARC Railways Agreement, and refusing to cooperate on combating cross-border terrorism. The SAARC had adopted a Convention on Mutual Legal Assistance in Criminal Matters almost eight years ago.



Mon, 30 Jan, 2017

Oceanic destiny II

By Govind Bhattacharjee

In his book, *Monsoon: The Indian Ocean and Future of American Power*, the American author, Robert Kaplan, had argued that the geopolitics of the 21st century will be decided by events in the Indian Ocean rim which is emerging as the new geopolitical centre of the world. Kaplan's narrative rests on the premise that the Indian Ocean's regular monsoon winds, which carried traders across the ocean since antiquity, had established cultural and economic patterns which are still very much in action. There has been little research so far on issues relating to security, stability and sustainability of the Indian Ocean Region and its future potential from the geopolitical and strategic perspectives of the 21st century. The concept of proactively promoting and engaging in a broader Indian Ocean grouping still lies at the periphery of our national objectives and geopolitical goals, ignoring the advantages conferred upon us by history. We are still unmindful of what Nelson Mandela had prophetically said in 1995, "The natural urge of the facts of history and geography should broaden itself to include the concept of an Indian Ocean Rim for socio-economic cooperation and other peaceful endeavours."

One of the earliest works on the subject, *Histoire ancienne des états hindouisés d'Extrême Orient* published in 1944 (translated as "The Indianised States of South-east Asia") by the French archeologist George Cœdès explores the dharma-dhamma continuum that is evident even today in the thousands of Hindu-Buddha temples practically all over South-east Asia ~ Malaysia, Indonesia, Thailand, Cambodia, Vietnam, Laos, Myanmar. India's relations with these countries date back at least to 1st millennium AD or even earlier; even countries on the eastern and southern coast of Africa and in the Middle East share thousands of years of close socio-cultural interaction through maritime trade links with India.

In 1947, K M Panikkar had observed, “Millenniums before Columbus sailed the Atlantic and Magellan crossed the Pacific, the Indian Ocean had become a thoroughfare of commercial and cultural traffic.” That was one of the earliest globalisations on record. Sanjeev Sanyal, in his book *Ocean of Churn*, had mentioned that the Middle East and Iran had trade links with the Indus Valley people since the Harappan era, that the merchant ships from Guajrat used to sail along the Makran coast trading along the way, past Gwadar and Sutkajen-dor (now near the Iran-Pakistan border). Discovery of Harappan artifacts and seals as far as Southern Iran suggests a continuum of economic and cultural trails all along. The trail survived till the 1960s, The Indian rupee was legal tender in most Middle East countries including Bahrain, Qatar, Oman and UAE; they resorted to their own currencies only after the sharp devaluation of the rupee by the RBI in 1966. The supreme living trail is of course the hundreds of thousands of Indians who live and work in the Gulf countries. Sanyal narrated how seafarers from Odisha and Bengal had started visiting Sri Lanka from the sixth century BC. The first Indianized kingdom emerged in Vietnam’s Mekong delta around 1st Century BC, established, according to legend, by a Brahmin named Kaundinya, to whom both the Chams of Vietnam as well as Khmers of Cambodia trace their ancestry. By then, Indian mariners had learnt enough about monsoon winds and ocean currents to follow the north-eastern monsoon to sail to Sri Lanka in mid-November, an event that is still commemorated in Odisha on the day of Kartik Purnima. After replenishing the fresh water and provisions in Sri Lanka, mariners would set sail again in January, following ocean currents to Sumatra, then known as Swarnadwipa, and from there, to continue their voyage past the Malacca Strait on to Malay Peninsula, Borneo and Vietnam, or southward along the western coast of Java, then known as Jabadwipa, on to Bali. After trading for two months, by mid-March, they would start their return journey to reach Sri Lanka in time to catch the south-west monsoon that would take them back home.

With more knowledge about ocean currents and monsoon winds, Indian seafarers became more adventurous. They sailed not only from Odisha and Bengal, but also from Andhra and Tami Nadu. Cotton was the most important export, and Indian cotton carried the seeds of Indian culture, language and religion to the countries of South-east Asia. Hinduism and Buddhism spread within a few centuries, and Mahabharata and Ramayana struck deep roots along with Sanskrit in South-east Asia. This has survived the onslaught of Islam and colonial rule by the Portugese, the Dutch and the British till today. Hinduism is still dominant in Bali and Buddhism in Myanmar. The ninth century Buddhist temple of Borobudur and the 10th century Hindu temples of Prambanan in Indonesia and the 12th century Hindu temple of Angkor in Cambodia still attract millions of tourists. The Indian links are remembered with considerable warmth.

The Hindu Srivijaya dynasty in Sumatra and Malay Peninsula (7th-13th centuries), Angkor (Khmer) in Cambodia (9th-15th centuries), Majapahit in Java (13th-16th centuries) and Kingdom of Champa in Central and Southern Vietnam (2nd-17th centuries) remained enduring powers in the region, before the gradual spread of Islam from 14th Century onwards and then colonisation by Europeans would eclipse their glory. Along the west coast of India also, merchant fleets from Arabia negotiated the waters of the Arabian Sea, sailing south hugging the western coast of India, past Saurashtra and the Gulf of Khambhat, through the estuary of Narmada to the modern port of Bharuch, then Barygaza. The Arab merchants would reach the shores of Kerala within a few centuries. It was through this route that groups of Christians and Parsis fleeing persecution in Iran would reach India, making it their home forever.

It is indeed paradoxical how the adventurous, seafaring people of India gradually turned insular and lost their strength before succumbing easily to foreign invasions, and how even crossing the sea (Kalapani) became stigmatized in society. In his seminal work, “Project ‘Mausam’: Maritime Routes and Cultural Landscapes” was launched as a transnational project by the Ministry of Culture, Government of India in 2014, to rekindle the long-lost ties across nations of the Indian Ocean and to forge new avenues of cooperation and exchange. The project, launched by India in partnership with member states, will mark a significant step in recording and celebrating this important phase of world history from the African, Arab and Asian perspectives. But to regenerate the economic links is even more important, and a sustainable way to achieve this is through the “Blue Economy”.

Gunter Pauli's 2010 book, *The Blue Economy: 10 years, 100 innovations, 100 million jobs* promises to "shift society from scarcity to abundance 'with what is locally available', by tackling issues that cause environmental and related problems in new ways". It relies on the design of sustainable systems to fuel "blue growth" which addresses the problems of resource scarcity and waste disposal, while focusing on sustainable development in a holistic manner. Blue Economy holds immense promise for the Indian Ocean region which has a treasure of vast untapped natural resources. It has the potential to offer many benefits, from utilising the untapped marine and mineral resources of the Indian Ocean to interconnecting, boosting and synergising the coastal national economies of the region. It can also revive the IORARC as an Ocean-based, close-knit and vibrant community. In fact, IORARC has already adopted the Blue Economy as a top priority, and identified eight priority areas for cooperation between the member states including fisheries and aquaculture, renewable ocean energy, seaports and shipping, seabed exploration for minerals etc. One only hopes that the ideas are translated into action, because like in the past, what happens in the Indian Ocean now will determine the course of human history once again. (Concluded)



Mon, 30 Jan, 2017

Declassified CIA Reports - 'China let Pak sidestep N-check, risked US ties'

'Didn't Push For IAEA's Inspection'

China risked its own nuclear cooperation with the US by going ahead with its nuclear collaboration with Pakistan, recently declassified CIA documents have revealed.

In the files, the US noted that China did not ask Pakistan to open its nuclear installations to IAEA inspections after signing a nuclear agreement with the latter. The text of the agreement was pretty anodyne, focusing on non-military nuclear technology, radio-isotopes, medical research and civilian power technology. By this, the US noted, China wanted to develop a nuclear export market in Pakistan in "non-sensitive" areas. This would "reassure" countries like the US which were already apprehensive about Pakistan's nuclear designs.

"We cannot rule out the possibility that China may feel it will be easier to cooperate clandestinely with Pakistan behind the smokescreen of regular, IAEA-safeguarded cooperation activity in non-sensitive areas," a CIA report observed.

By 1983-84, it had become clear to the US that the China-Pakistan nuclear cooperation went much deeper. In February 1983, a US Congressional committee was informed by CIA that the US had proof that China and Pakistan were talking nuclear weapons manufacture. CIA knew China had handed over the design of a nuclear bomb it had tested in Lop Nor. The US suspected China had handed over enriched uranium to Pakistan as well. The China-Pakistan relationship in military matters goes back to 1965. In that year, China had supplied a dozen IL-28 Beagle Jet light bombers, 50 MIG-19 Farmer jet fighters and 100 tanks, along with artillery and small arms. A 1966 CIA report said, "The Chinese see this aid as the price they must pay to keep alive a marriage of convenience based largely on a common antipathy to India. The Chinese recognise that their military assistance will lead to increased tension between Pakistan and India and will force New Delhi to split its forces between the front facing Pakistan and that facing China.

"The Chinese also know that their support causes strains between Pakistan president Ayub (Khan) and the US and complicates Moscow's efforts to increase its influence in the subcontinent. It said Pakistan turned to Peking (Beijing) for military aid in order to rebuild its armed forces after the 1965 India-Pakistan war. US and UK had imposed arms embargoes on India and Pakistan then. China was also in contravention of its non-proliferation commitments clandestinely helping Iran develop its nuclear programme, along with nuclear relations with South Africa and Argentina, both of whom had not, until then, signed the NPT.

The US assessment was that Pakistan could explode a device “within weeks“. It also believed a “senior Pakistani official“ was present during the May 1983 test of a nuclear device by China in Lop Nor.



Mon, 30 Jan, 2017

Atomic clocks on indigenous navigation satellite develop snag

By Madhumathi D.S.

ISRO chairman says fleet is fine, trying to revive failed clocks

NavIC, the indigenously built satellite- based positioning system, has developed a technical snag in the atomic clocks on its first satellite.

In the NavIC, a constellation of seven satellites, one of the three crucial rubidium timekeepers on IRNSS-1A spacecraft failed six months ago. The other two followed subsequently.

A. S. Kiran Kumar, Chairman of the Indian Space Research Organisation, confirmed the glitch in the clocks but clarified that the satellite was otherwise all right, and the rest of the satellites were performing its core function of providing accurate position, navigation and time. However, without its clocks, the IRNSS-1A “will give a coarse value. It will not be used for computation. Messages from it will still be used.”

ISRO, he said, was trying to revive the clocks on 1A and readying one of the two back-up navigation satellites to replace it in space in the second half of this year.

“There are some anomalies in the atomic clock system on board. We are trying to restart it. Right now we are working out a mechanism for operating it,” he told *The Hindu*.

“The problem is only with the clock system of one spacecraft. The signals are all coming, we are getting the messages, everything else is working and being used, except the stability portion which is linked to the clock,” he said. A minimum of four working satellites was sufficient to realise the full use of the navigation system”.

NavIC has 21 atomic clocks on seven spacecraft. “How would the other clocks fare? Would ISRO reconsider the supplier of its atomic clocks? Such questions are not easy to answer. Generally any [space] hardware is an issue. We have to find ways of going around it,” he said.

The troubled IRNSS-1A spacecraft was put in space in July 2013 and has an expected life span of 10 years. The seventh navigation satellite, IRNSS-1G, was launched in April 2016.

The satellites of the 1,420-crore NavIC, short for Navigation with Indian Constellation, and also known as the Indian Regional Navigation Satellite System, give precise information on position, navigation and time (PNT) of objects or persons to users on ground, sea and air.



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‘Radiation at altitude harmful’

NASA researchers have revealed the results of a major new study into the effect of radiation on high altitude travellers. Cosmic rays from the sun and space crash into molecules in the atmosphere, causing particle decay and radiation which can be harmful to our health.

The new study, using weather balloons, took some of the first radiation measurements of their kind at altitudes from 26,000 feet to over 120,000 feet above Earth. While we’re mostly safe from this radiation on the ground, pilots and aircrew are more exposed to the dangerous radiation, as are astronauts. Earth’s magnetosphere acts as a magnetic shield and blocks most of the radiation from reaching the planet. However, particles with enough energy can penetrate the magnetosphere and the atmosphere.