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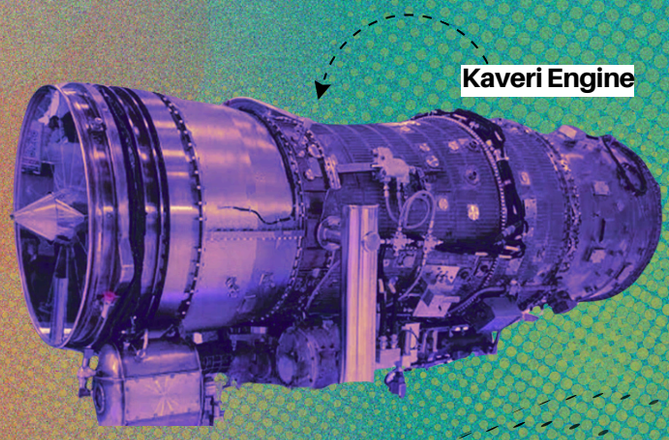
AKSHA DRISHTI

A quarterly chronicle, delivering strategic insights and in-depth analysis of national security and defence trends.

Wings of Steel . Engines of Worry ?

Navigating Turbulence: Addressing Engine Challenges in the Indian Air Force



Technology delayed ! is technology denied

Page 29: Feature on Assad's Downfall : Unleashing a Paradigm Shift in Global Security

Page 33: The Weapon Watch: Tracking the Latest Developments in Global Military Capabilities, Featuring PINAKA MBRL

RAKSHA DRISHTI

"PEACE IS THE FOUNDATION OF SECURITY, AND STRENGTH RISES FROM THE DEPTH OF SILENCE"

~SRI AURBINDO

It is with great pleasure and profound gratitude that we present the second edition of RakshaDrishti, the quarterly publication dedicated to the meticulous exploration of defence, strategy, and geopolitics. The overwhelming reception of our inaugural issue has galvanised our resolve to provide even more incisive and intellectually enriching content, tailored to the needs of an erudite readership.

In this edition, we endeavour to build upon the strong foundations laid previously, addressing the pressing challenges and transformative developments that define the contemporary global order. From the recalibration of geopolitical alliances to the integration of disruptive technologies in modern warfare, our focus remains on presenting a nuanced understanding of the strategic imperatives that shape our world.

RakshaDrishti stands as a bridge between academic rigour and practical insight, fostering a space where theory and praxis converge. This issue features a diverse array of contributions, including analyses from seasoned scholars and perspectives from emerging thinkers. Collectively, these voices offer a rich tapestry of ideas that engage with the complexities of security, diplomacy, and innovation in defence.

As we navigate the multifaceted realities of international relations and military strategy, we aim to challenge preconceived notions, provoke critical thinking, and inspire meaningful dialogue. Each article has been carefully curated to ensure that it not only informs but also stimulates intellectual curiosity and debate among our readers.

We extend our sincerest gratitude for your continued support and invite you to journey with us as we illuminate the intricate dynamics of global security. Let RakshaDrishti remain your trusted guide in understanding the evolving paradigms of defence and strategy, fostering a community where informed discussions flourish.

With best regards,

Editorial Team
RakshaDrishti – Illuminating Perspectives, Empowering Futures

WHO WE ARE:

AMITY INSTITUTE OF DEFENCE & STRATEGIC STUDIES (AIDSS)

We, the students of the Amity Institute of Defence & Strategic Studies (AIDSS), take immense pride in being part of a premier academic environment that not only aligns with global standards but also emphasizes the importance of India's role in the evolving geopolitical landscape. Our academic journey here is deeply rooted in the principles of the New Education Policy (NEP), which underscores interdisciplinary learning, skill enhancement, and employability.

AIDSS offers a wide range of programs, including the BA (Honors) in Defence & Strategic Studies, which prepares students for careers in geopolitics, national security, defence technology, and conflict resolution through practical exposure and industry-focused learning. Our advanced MA in Defence & Strategic Studies, PG Diploma in Geopolitical Risk Analysis, and PhD programs cultivate strategic thinkers, researchers, and analysts equipped to address the complex challenges of global and national security.

These programs emphasize critical skills through specialized courses and quantitative analysis, supported by training, internships with government institutions, and collaborations with think tanks and military services.

Our students have consistently excelled across public and private sectors, building careers in the armed forces, intelligence agencies, foreign service, think tanks, risk consultancy, and media. Prestigious organizations like McKinsey, Deloitte, KPMG, TATA Advanced Systems, and think tanks such as IDSA, ORF, and NMF regularly recruit AIDSS graduates, with entry-level salaries ranging from 5-8 lakh per annum. These achievements reflect our commitment to developing future leaders capable of making meaningful contributions to India’s strategic landscape and beyond. With programs benchmarked against global leaders like King’s College London and Haifa University, Israel, we remain committed to excellence, inspiring our students to thrive and represent India on international platforms.

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FROM THE EDITOR

STARTEGIC FOREWORD

Welcome to the second issue of RakshaDrishti, our quarterly newsletter dedicated to defence and strategic studies. Building on the momentum of our inaugural edition, we are excited to present a fresh compilation of articles that delve into the intricate world of defence, geopolitics, and strategic affairs.

In this edition, our featured topics take you on a journey through some of the most pressing issues of our time. We examine the latest advancements and challenges in aeroengine technology, providing insights into how these innovations are shaping modern military aviation. We also take an in-depth look at the Pinaka military system, exploring its strategic relevance and the evolving role it plays within our defence framework. Additionally, we analyze the recent political developments in Bangladesh and discuss the wider regional implications of this pivotal change.

This issue is a result of the hard work and dedication of our team of writers, editors, and designers, all committed to bringing you well-researched, thought-provoking content that extends beyond conventional perspectives. As a continuing journey from my experiences as a third-semester student, contributing to RakshaDrishti has been immensely rewarding, broadening my understanding of defence studies and encouraging me to think critically about contemporary issues.. Notably, this edition will feature a commentary from an esteemed student outside our department, thereby broadening our analytical horizons.

We also invite you to join our growing community of contributors. If you have insights, analyses, or research to share on these or other defence-related topics, please consider contributing to future issues. Your feedback and participation are vital in making RakshaDrishti a dynamic platform for informed debate and discussion.

Thank you for your continued support and readership.
Enjoy this issue.

PUNEET PARASAR
EDITOR, RAKSHADRISHTI

FUTURE

08 **Wings of Steel, Engines of Worry? The Indian Air Force Story**
Mr. Kartikeya Gupt

19 **India's P-75(I):A Strategic Leap for Maritime Superiority**
Mr. Puneet Parasar

24 **Pinaka: India's Indigenous Rocket Artillery Success Story**
Ms. Amita Pilania

29 **Assad's Downfall : Unleashing a Paradigm Shift in Global Security**
Mr. Kabeer Ghose

A New South Asian Axis Underway: Re-emergence of a Bangladesh-Pakistan Military Conundrum 15
Mr. Barshan Karmakar

THE WEAPON WATCH: Tracking the Latest Developments in Global Military Capabilities, Featuring PINAKA MBRL 33
Mr. Barshan Karmakar

THE GLOBAL WATCHDOG: Insights into Global Power Shifts 38

RUNDOWN

STRATEGIC PULSE

"Insights from the Armed Forces & Defence Industry"

DEFENCE PRODUCTION & ACQUISITION 37

ARMY 18

NAVY 23

28

14

INSURGENCY

DRDO

32

R & D and ATMANIRBHARTA

AIRFORCE

RAKSHA DRISHTI

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WINGS OF STEEL. ENGINES OF WORRY? THE INDIAN AIR FORCE STORY

Cover *Story*

To avoid losing a piece, many a person has lost the game"
~Savielly Tartakover

Mr. Kartikeya Gupt
Ph.D. Scholar, AIDSS,
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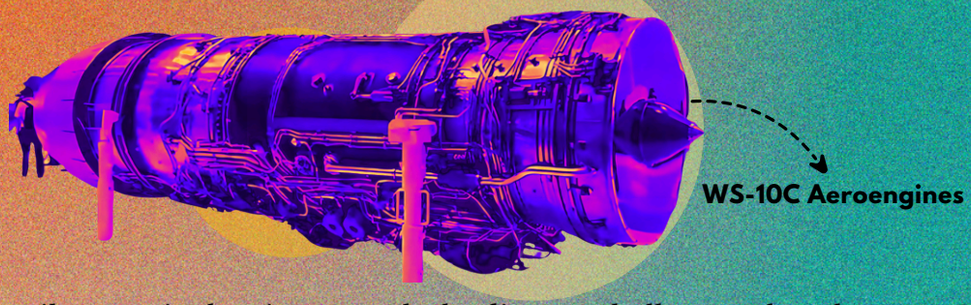
On 26th December 2024, China shell-shocked air power enthusiasts of India and the world alike. It flight-tested two previously unseen crewed combat aircraft, with tailless configuration. Although aviation experts express cautious assessment, the innovation capacity of Chinese combat power has brought about a gloom and doom environment on social media.

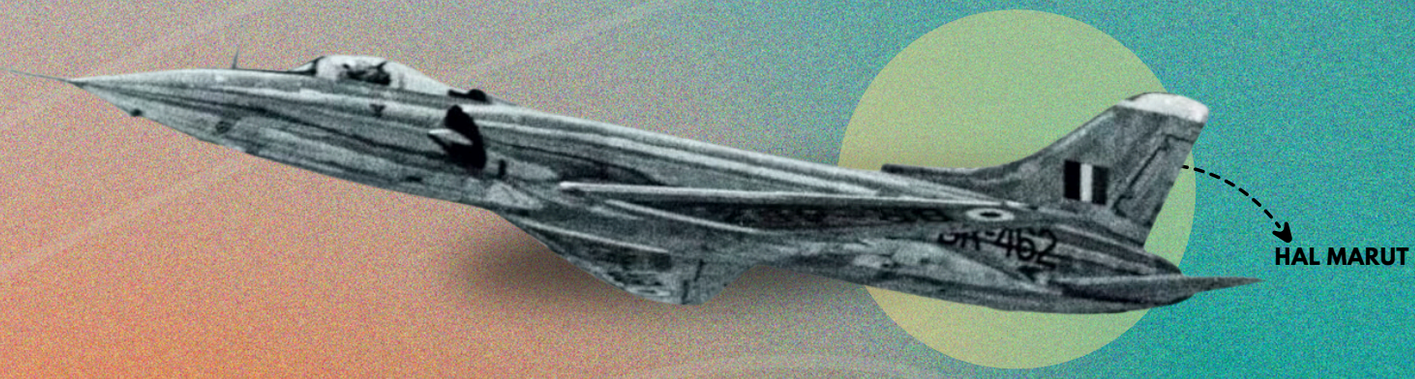
Many are quick to berate the Indian defence establishment and public sector undertakings for its apathy towards declining sanctioned squadron strength of combat fighter aircraft of the Indian Air Force (IAF). Several lay blame on the delayed timeline of the development and induction of indigenous Light Combat Aircraft (LCA), Tejas, or the failure of indigenous Kaveri engine for powering Tejas. Others are prompt to admonish India's Cabinet Committee on Security for putting off high priority acquisitions, while a few are unsympathetic to the nation's technological constraints and paucity of funds in aiding research and development (R&D) projects. In short, chaos is abundant and the Chinese online forums are brimming with glee.



WS-10C Aeroengines

Even as despair prevails, now is the time to calmly discern challenges that threaten IAF's air superiority and seek realistic solutions. Although on the surface, the Chinese give the impression of deftly one-upping the Indian defence establishment, on careful observation, their seemingly next-generation fighter prototypes are propelled by fourth generation WS-10C aeroengines, used in its other fighter aircraft such as Chengdu J-20 stealth fighter. China, at the earliest may induct the two aircraft designs in their armed forces only by the next decade, owing to its dependence on work-in-progress WS-15 advanced engines for full production, a necessary prerequisite for true next generation capabilities.

A temporary reprieve, India must quickly address shortcomings in its own industrial base, be it designing powerful aeroengines, progressive airframes, or state-of-the-art avionics. Without focusing primarily on providing necessary thrust, efficiency, and high-speed stability, the aspiration of powering a fighter aircraft indigenously will at any case remain out of reach.



The Hindustan Aeronautics Limited (HAL) had realised this to its dismay when developing the HF-24 Marut aircraft. Engines form the heart of a fighter aircraft. The previous sentence cannot be stressed enough as it is the aeroengine which powers the aircraft other than supplying electrical, mechanical, and hydraulic power.

A significant detail, as India's public sector undertakings and private industry ramps up investment in aeroengine development projects is that the qualitative advancement and timeline of these efforts depend on the challenges stemming from regional geopolitics. A potential adversary, China officially allocates approximately three times the amount India does for its defence budget. In terms of numbers and range of offensive and defensive air assets of People's Liberation Army Air Force (PLAAF), emerging domain warfare - Space, Cyber, & Electromagnetic Spectrum effects on enhancing air power, and advancements in missile technology and unmanned aerial vehicles to shape air warfare, China is simply ahead.

To top it off, the enhancing strategic partnership between China and India's evergreen adversary, Pakistan pose a significant challenge to IAF's air superiority. Their defence bond complicates calculations as Pakistan Air Force (PAF) offsets any capability gap by acquiring advanced Chinese crewed and unmanned aircraft and assured supply chain architecture for its airborne systems. Moreover, the strength of PAFs combat fighter aircraft squadrons, supporting aircraft, and missile inventory adds to IAF's worries. Facing both PAF and PLAAF in a potential two-front confrontation is a realistic scenario, especially when not planning for an exclusive, limited conflict with either air force.

To maintain readiness, the IAF has presented urgent procurement needs. In terms of combat fighter aircraft alone, it has sought LCA, Advanced Medium Combat Aircraft (AMCA), and Multi Role Fighter Aircraft (MRFA). Additionally, the need for heavier aircraft, whether for early warning, tanker, and transport has been outlined. IAF has also expressed its interest in the Indian Multi Role Helicopter (IMRH) project. Understanding the changing character of warfare and the increasing effectiveness of unmanned systems in present conflicts, the IAF is also anticipating a fleet of Unmanned Combat Aerial Vehicles (UCAVs), Medium Altitude Long Endurance (MALE), and High Altitude Long Endurance (HALE) drones. The rapid enhancement of PLAAF and PAF's combat potential has necessitated procuring specialised advanced engines, guaranteeing optimal performance for IAF's crewed and unmanned aircraft.

William Reynolds, a scholar of strategic studies, has categorised defence procurement into four categories from lower to higher order of expenditure – Firstly, the acquisition of a complete weapon system whose R&D and production costs were wholly borne by the defence industry of a single foreign nation or an external multinational effort. Secondly, investment in international collaboration to build a weapon system, whose R&D and production costs are shared by the nation in partnership with a single foreign nation or an internal multinational effort. Thirdly, licensed production to bypass R&D costs of the weapon system and divide or shoulder production costs. Lastly, to carry out R&D and production costs of an indigenous weapon system within one's own borders.

Another category, which has been overlooked by Reynolds, is the acquisition of a foreign company to access mature R&D of its weapon systems. This eliminates the cost of innovation and is useful in driving cheaper production. Every category has its benefits and drawbacks, and pursuing a mix of them based on IAF's strengths and weaknesses can deliver the best results, especially when customising the aeroengine to meet combat requirements of different assets. The demands of the IAF should offer pause on any plan relying solely on a start-from-scratch, wholly indigenous aeroengine.

Achieving self-sufficiency is a complex task, given the technological inadequacy of India's domestic aeronautical engine industrial base.

Recognising this capability gap, India's Ministry of Defence (MoD) has so far adopted a balanced approach to aeroengine acquisition, combining affordability with the need for operational capability. To meet the IAF's present and future requirements, a combination of commercial-off-the-shelf military purchases, collaborative projects with Original Engine Manufacturers (OEMs) of friendly partners, and investment in sovereign aeroengine projects underscore operational pragmatism.

Advancing Indigenous Engines

While the balanced approach above is the chosen course of action for IAF, Indian leadership remains committed in prioritising indigenous development as a long term objective. This commitment is evident in Prime Minister Modi's vision of "Aatmanirbar Bharat Abhiyaan or Self-Reliant India" and "Make-In-India" policy. This push has motivated public undertakings like HAL and Gas Turbine Research Establishment (GTRE), private companies, and startups to actively contribute to building a strong foundation for an indigenous engine ecosystem.

Although a growing economy and increasing defence budget may afford the nation to go ahead with aircraft purchases from reliable partners as the cheapest option to obtain advanced engines, the push for supplying locally sourced engines for IAF's combat aircraft lies in the concept of 'national resillience'.

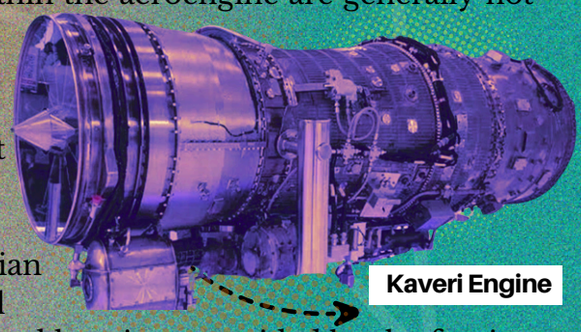
This ensures that a nation has entire control over its security interests and allows for operational flexibility without any foreign interference. Reynolds wisely asserts, “Even license-built, or collaborative, equipment programs can have major sovereignty issues”. Also, India’s war fighting capabilities of the future would be severely restricted if there is a difference of alignment with the very nations from whom it has imported its military hardware. Prioritising indigenous capabilities, hence protects a nation’s strategic autonomy over time.

In times of crisis, depending on external suppliers for key defence equipment or Maintenance, Repair and Overhaul (MRO) might present us with vulnerabilities such as supply chain disruption, delayed deliveries, or limited access owing to the evolving geopolitical environment. Recent conflicts have indeed demonstrated that the safest hands are our own, particularly when partners turn unpredictable.

However, the building of indigenous engines is easier said than done. So far, India is entirely reliant on procurements of aeroengines from foreign OEMs for civil and military crewed aircraft. It is also dependent on the same entities for spare parts as well as technical support extending for the entire service life of the aeroengine, which may last decades. The nation’s vulnerability in this aspect is unresolved and it has to put up with the whims of foreign OEMs, and by extension, their native nations. If India does not align with these nations, there may be a possibility of sanctions imposed on both civilian and military aircraft and its air power operations can be starved over time without access to spares or technical services.

Foreign-based OEMs have invested significant time and money in developing their engines. They would be highly unlikely to agree to joint ventures or co-development projects without retaining critical design data, which ensures India depends upon them for the entire service life of the engines. Not doing so, would provide India the opportunity to arise as a future competitor and it would be against their interest to have a new competitor in the global market. Only up to certain limits, these OEMs might be willing to share Transfer of Technology (ToT) to save manufacturing costs for themselves.

Air Vice Marshal (AVM) Suresh Singh, a fellow of the Aeronautical Society of India, has drawn attention to the multiple restraints present in dealing with an OEM related to acquisition of its engine. Know-how and know-why of critical modules within the aeroengine are generally not provided as the OEMs of those modules may belong to a different nation or manufacturer. Without express approval of the OEMs, there may be restrictions on future improvements, life extension projects, replacement of critical modules with indigenous products even if they meet international standards, sale to friendly foreign nations, futuristic improvements, and involvement of Indian specialists or raw materials. Other restrictions might entail the MRO of the engine to be done only at certain designated locations provided by the foreign OEM, and insistence on sharing operational data. AVM Sharma also belabours the point of hiring contract specialists when comprehending the legal agreement of an OEM in order to negotiate reasonable constraints, which are legally binding. India is yet to meet the high standard required in hiring legal specialists with enough technical understanding. It is largely so because the Government has not focused adequate attention to this area, which carries immense implications for building an indigenous aeroengine industrial ecosystem.



Kaveri Engine

COVER STORY / WINGS OF STEEL. ENGINES OF WORRY? THE INDIAN AIR FORCE STORY

In 1989, an indigenous aeroengine project, Kaveri, was ultimately initiated under Defence Research and Development Organisation's GTRE laboratory and its R&D costs sanctioned by the Ministry of Defence. However, the project for the past three decades has failed to live up to initial or revised expectations and could not provide any meaningful contribution to India's aspirations of a feasible jet engine that could be utilised for both single aisle commercial aircraft and the LCA project. In its entire developmental journey, multiple full-fledged engines were crafted and were subjected to ground and air based tests, based on realistic parameters without finding any success.

In his outlook, AVM Sharma deduced that one of the key reasons for the failure of the Kaveri engine was a lack of accountability. He noted that apart from a few progress reviews by IAF officers from time to time at GTRE, the developmental phase of the aeroengine which ended up taking more than thirty-three years witnessed only one audit of the account and project progress update by the Controller of Defence Accounts and the Public Accounts Committee. It may have been a factor for the costs ballooning to 250 million United States dollars for the entire project cycle at GTRE, as per AVM Tejpal Singh, Assistant Chief of Air Staff (Plans). As per credible yet unproven sources, few other reasons for the failure of Kaveri engine presume – insufficient dry and wet thrust as planned, bulkier engine than expected, inadequate performance at high altitudes, lower thrust-to weight ratio, timely unavailability of developmental funds, inadequate technical expertise at GTRE, among others.

However, in a positive development, the Dry Kaveri aeroengine, which retains seventy-five percent of the components and design features of the original Kaveri engine, with improvements in design, has confirmed meeting IAF's requirements of a next-generation indigenous UCAV project, according to Indian Defence Research Wing. In another breakthrough, HAL has inducted its PTAE-W turbojet engine to propel indigenous CATS Warrior UCAV, which is part of the Combat Air Teaming System, an indigenous version of the "collaborative combat aircraft" concept. These small steps mark progress toward achieving self-sufficiency in indigenous aeroengine development and deployment. However, outstanding operational requirements for combat aircraft, helicopters, heavy aircraft, and UAVs are guided through acquisition of foreign aeroengines or joint production ventures between public sector undertakings and foreign state-owned or private companies.

Nevertheless, India's aspirations of securing future demands of both commercial and military aircraft would be ensured only by achieving indigenous development capability of a 110-130 KN aeroengine. To realise such aspirations, it is crucial to utilise the resources already developed at GTRE including technical manpower, introducing private participation, timely and adequate funding, honest and periodic accountability, lack of bureaucratic hurdles, and ultimately assigning it as the project of national importance with supervision from the highest levels of the Indian leadership.

Conclusion

Advancements in domestic engine technology are not at pace with the sophisticated demands of the Indian Air Force. These requirements continue to evolve as instability in the regional security environment persists besides adoption of technological innovation within adversarial armed forces. In the meantime, procurement from foreign original engine manufacturers endures as the choice of convenience for operational readiness. The aeroengine will continue to be the salient element of a military aircraft for the next several decades, until it is replaced by an advanced technological breakthrough, and so any substantial investment in its research and development will be worthwhile. Identifying commercial applications with minor tweaking in a military variant of the indigenous aeroengine should provide an incentive for private participation in its developmental phase. Despite past failures, Gas Turbine Research Establishment has the necessary capability to produce success by powering next-generation combat fighter aircraft and unmanned aerial vehicles.Positioning India as a self-sufficient nation in engine technology is a long work in progress, and requires genuine commitment at an accelerated pace from all levels of the government. The Indian Air Chief Marshal Amar Preet Singh recently vented out his exasperation on the irrelevance of research and development owing to delayed timelines of projects, with a pertinent message for all stakeholders, “technology delayed is technology denied.” May it be heeded for the future of Indian wings of steel.

“Technology Delayed is Technology Denied !”

STRATEGIC PULSE | INSURGENCY

1. Ethnic Strife Intensifies in Manipur – November 28, 2024

On November 28, 2024, the northeastern state of Manipur witnessed a surge in ethnic violence, particularly in the Jiribam district. Clashes between the Kuki minority and the Meitei majority escalated due to disputes over land rights, educational quotas, and government employment opportunities. A rocket-propelled grenade attack in Jiribam exacerbated tensions, leading to retaliatory actions, including arson and hostage-taking. Despite peace agreements and increased military presence, the unrest resulted in numerous fatalities and displacements, challenging ongoing peace efforts in the region.

2. Influx of Myanmar Fighters Aggravates Manipur Conflict – December 20, 2024

On December 20, 2024, reports emerged that combatants from Myanmar's civil war had crossed into India's Manipur state, intensifying the existing 19-month-long ethnic conflict. These fighters, equipped with advanced weaponry such as rocket launchers and machine guns, have heightened violence and contributed to criminal activities, including extortion and drug trafficking. In response, the Indian government deployed an additional 10,000 soldiers, increasing the total military presence to nearly 67,000, in an effort to restore stability.

3.Maoist Attack in Bijapur, Chhattisgarh – January 6, 2025

On January 6, 2025, a significant Maoist insurgent attack occurred in Bijapur district, Chhattisgarh. An improvised explosive device (IED), estimated to weigh between 60 and 70 kilograms, detonated, resulting in the deaths of eight security personnel from the District Reserve Guard (DRG) and a civilian driver. This incident marked the most substantial assault on security forces in the state in two years, underscoring the persistent challenges posed by left-wing extremism in the region.

4. Security Forces Achieve Major Victory in Abujhmarh – January 23, 2025

On January 23, 2025, Indian security forces conducted a successful operation in the Abujhmarh forest area of Chhattisgarh. The encounter led to the elimination of 16 Maoist insurgents, including several senior cadres. A significant cache of weapons and ammunition was recovered. This operation dealt a substantial blow to Maoist activities in the region, highlighting the effectiveness of intensified counter-insurgency strategies.

5.Union Home Minister Reports Decline in Insurgency – February 10, 2025

On February 10, 2025, Union Home Minister Amit Shah announced a 65% reduction in incidents of terrorism, left-wing extremism, and insurgency in Northeast India. He attributed this decline to the government's zero-tolerance policy against terrorism and the modernization of the police force through initiatives like the Police Technology Mission. The minister emphasized the administration's commitment to maintaining internal security and acknowledged the efforts of police personnel in achieving these improvements.

A NEW SOUTH ASIAN AXIS UNDERWAY: RE-EMERGENCE OF A BANGLADESH-PAKISTAN MILITARY CONUNDRUM

Mr. Barshan Karmakar
Ph.D. Scholar, AIDSS,
AMITY NOIDA

Bangladesh continues to witness a domestic turmoil ever since former Prime Minister Sheikh Hasina resigned and escaped to India on 5th August 2024. The movement to oust the former administration was led by a frenzy of radical elements in the name of a largely student-driven anti-quota enterprise. It ended with the initiation of a non-elected caretaker government, headed by a pro-United States sympathizer, Muhammad Yunus.

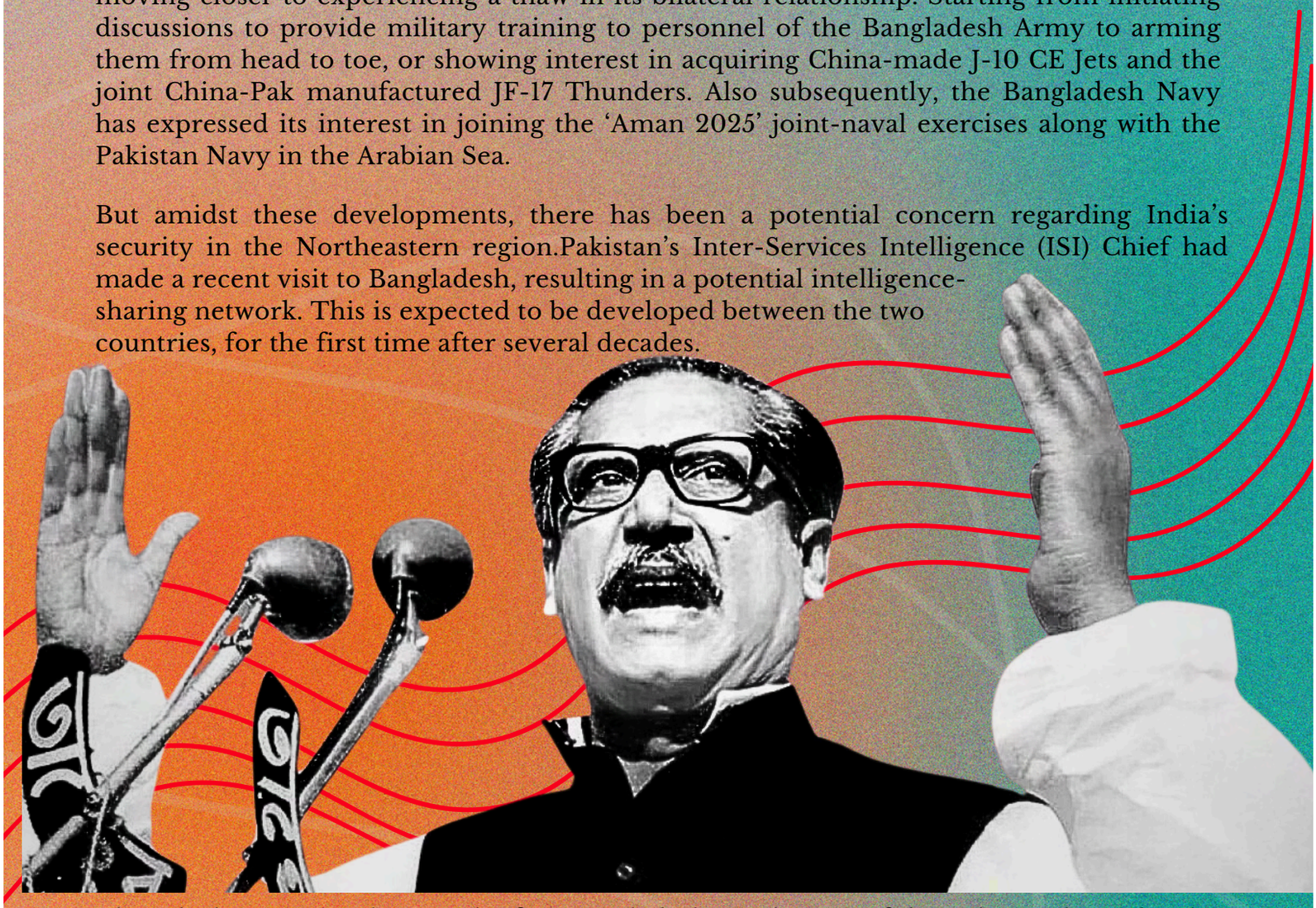
However, under the new caretaker ruling, new rhetoric has been espoused, be it questioning the former secular ideological character of the nation, or the historical legacy of the 1971 Liberation War by wiping out every mark and identity of Sheikh Mujibur Rahman. This has propelled the Yunus administration to enact reforms that change the Secular and Socialist disposition of its Constitution, thereby steering Bangladesh towards a new Islamic state.

Some of the most important happenings in these five and a half-months have been the strong developing cohesion with Pakistan to forge a Military Cooperation and the creation of a strong anti-India narrative using all banned Islamic Fundamentalist leaders and organizations.

Growing efforts of a new level of cooperation

After more than 50 years of largely distancing itself from Pakistan, Bangladesh is now moving closer to experiencing a thaw in its bilateral relationship. Starting from initiating discussions to provide military training to personnel of the Bangladesh Army to arming them from head to toe, or showing interest in acquiring China-made J-10 CE Jets and the joint China-Pak manufactured JF-17 Thunders. Also subsequently, the Bangladesh Navy has expressed its interest in joining the 'Aman 2025' joint-naval exercises along with the Pakistan Navy in the Arabian Sea.

But amidst these developments, there has been a potential concern regarding India's security in the Northeastern region.Pakistan's Inter-Services Intelligence (ISI) Chief had made a recent visit to Bangladesh, resulting in a potential intelligence-sharing network. This is expected to be developed between the two countries, for the first time after several decades.



Though this visit by the ISI Chief to Bangladesh was kept confidential, mostly to develop an intelligence network, it does not bode well for the stability and security of the Northeastern States of India

The visit of these officials took place at Rangpur District of Bangladesh, which stands close to the Siliguri Corridor of India, also popularly known among strategic circles as India's "Chicken's Neck." The Chicken's Neck is a narrow strip of land corridor connecting the eight Northeastern states of India and the town of Siliguri in West Bengal, on the Indian Side. The Rangpur District of Bangladesh is just 130 kms from the town of Siliguri, which also houses important military installations of the Indian Armed Forces.

Also, as a part of the visit, the Pakistani officials even planned to visit the Chittagong Hill Tracts, and any information about the visit has been kept under wraps. It is also believed that Pakistan's ISI is attempting to stage Bangladesh's territory to fight a proxy war against India, thereby destabilising the region.

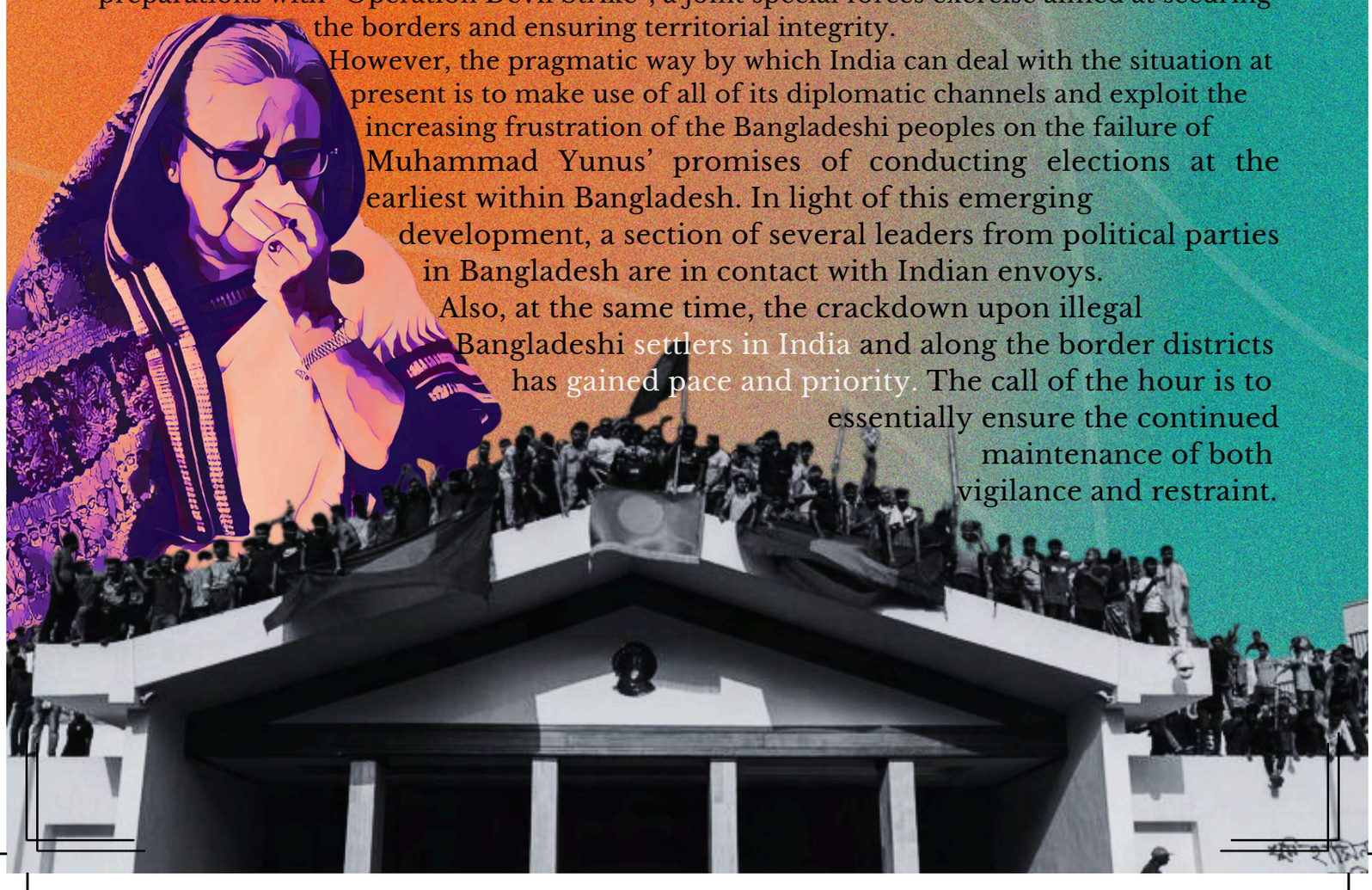
Scenario of Bangladesh since Sheikh Hasina's Ouster

Since the takeover by Muhammed Yunus as the Chief Advisor of the Interim Government of Bangladesh, troubles and challenges have been rising for India, especially at the borders surrounding the Indian State of West Bengal. Muhammad Yunus has already met Prime Minister Shehbaz Sharif three times, showing his enthusiasm in uplifting ties between the two nations as a priority. These meetings have led to several developments, including, the resumption of direct commercial flights between Pakistan and Bangladesh, which had been halted in 2018. Also earlier, Pakistani nationals were not given a visa to travel to Bangladesh except in rare cases. They were subjected to stringent security clearance requirements from different state agencies, which made travelling to Pakistan nearly impossible. Presently, visa requirements have been eased and in return, Pakistan has removed conditions of visa fees and security clearances for Bangladeshi travellers.

In November 2024, the first cargo ship from Pakistan docked at the Chittagong Port of Bangladesh, and a strengthening maritime link between these two nations has now helped to ease import restrictions on Pakistani goods.In earlier times, any goods coming from Pakistan required a 100 percent physical inspection upon their arrival.

India's stand on the scenario

India has not directly responded with an aggressive military posturing but has resumed the levels of deployment through the armed forces and the Border Security Force (BSF) at the borders to assert its border security. The BSF has launched, "Operation Alert" along the international border it shares with Bangladesh, in particular along the border of the Indian state of West Bengal. The Indian Army and the Indian Air Force have upped their preparations with "Operation Devil Strike", a joint special forces exercise aimed at securing the borders and ensuring territorial integrity.



However, the pragmatic way by which India can deal with the situation at present is to make use of all of its diplomatic channels and exploit the increasing frustration of the Bangladeshi peoples on the failure of Muhammad Yunus' promises of conducting elections at the earliest within Bangladesh. In light of this emerging development, a section of several leaders from political parties in Bangladesh are in contact with Indian envoys.

Also, at the same time, the crackdown upon illegal Bangladeshi settlers in India and along the border districts has gained pace and priority. The call of the hour is to essentially ensure the continued maintenance of both vigilance and restraint.

STRATEGIC PULSE

INDIAN ARMY

1. Inception of 'VINBAX 2024': A Milestone in Indo-Vietnamese Military Collaboration, November 4, 2024

The fifth iteration of the Vietnam-India Bilateral Army Exercise, designated as "VINBAX 2024," commenced on November 4, 2024, at Ambala. Spanning until November 23, this exercise underscores the deepening military rapport between India and Vietnam. The Ministry of Defence emphasized that VINBAX 2024, structured as an advanced field training exercise, aims to bolster mutual confidence, enhance interoperability, and facilitate the exchange of best practices between the Indian Army and the Vietnam People's Army. This initiative not only fortifies bilateral ties but also augments regional security architectures.

2. Army Chief Highlights Persistent Standoff Along LAC, January 15, 2025

On January 15, 2025, during the annual press conference marking Army Day, Chief of Army Staff General Upendra Dwivedi addressed the ongoing standoff along the Line of Actual Control (LAC). He acknowledged that, despite disengagements in certain areas, a degree of standoff persists, necessitating efforts to restore mutual trust between India and China. General Dwivedi emphasized the imperative of redefining trust parameters in light of the altered dynamics post-April 2020, underscoring the need for continued diplomatic and military engagements to ensure stability along the LAC.

3. Indian Army to Replace Pack Mules with Robotic Dogs, January 14, 2025

Embracing technological advancements, the Indian Army announced plans on January 14, 2025, to phase out its traditional pack mules in favor of AI-powered robotic dogs. These robotic quadrupeds are capable of navigating stairs and steep terrains, operating in extreme temperatures, and will be deployed alongside drones to enhance logistical support in remote and mountainous regions. While each robot can carry up to 15 kg, compared to a mule's 80 kg, they eliminate the need for extensive training and sustenance, marking a significant shift towards modernization in military logistics.

4. Indian Army's Field Artillery Rationalization Plan Progresses with Indigenous Howitzers, January 25, 2025

As part of its Field Artillery Rationalization Plan, the Indian Army has made significant progress in inducting indigenous artillery systems. The 'Dhanush' howitzer has been operationalized near the Line of Actual Control, with plans to complete the induction of all units by 2026. Additionally, the Advanced Towed Artillery Gun System (ATAGS) has completed user trials and is slated for deployment along India's borders with China and Pakistan. These developments underscore the Army's commitment to modernizing its artillery capabilities through indigenous solutions.

5. Indian Army Chief Appeals to Nepal to Resume Gorkha Recruitment January 16, 2025

Indian Army Chief General Upendra Dwivedi has reached out to his Nepali counterpart, urging the revival of Gorkha recruitment into the Indian Army. This recruitment process has been on hold since 2020 due to the COVID-19 pandemic and subsequent concerns over India's Agnipath recruitment scheme. General Dwivedi expressed optimism, stating, "I have personally requested the Nepal Army chief to revive the recruitment of the ethnic Gorkha community in the Indian Army."

INDIA'S P-75(I)

A STRATEGIC LEAP FOR MARITIME SUPERIORITY

Mr. Puneet Parsar
Student, AIDSS, AMITY
NOIDA

The finalization of India's Project-75I (P-75I) submarine deal marks a watershed in the country's effort to modernize its naval capabilities. As a core component of the Indian Navy's long-term maritime strategy, this ambitious initiative exemplifies the synergy between indigenous innovation and international technological collaboration. By integrating advanced Air Independent Propulsion (AIP) technology and leveraging domestic shipbuilding expertise, the P-75I project is poised to revolutionize underwater warfare capabilities, ensuring strategic autonomy and enhancing India's maritime deterrence.

Historical Evolution: From Vision to Implementation

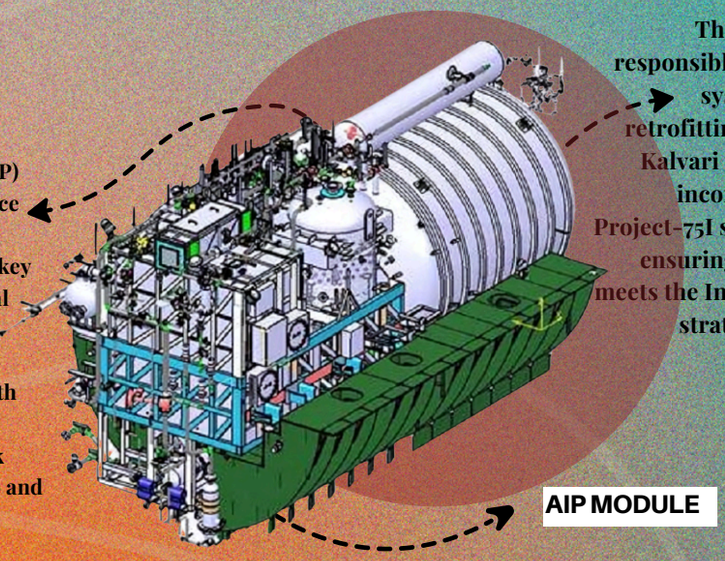
The conceptual framework for India's submarine modernization dates back to 1999, with the Indian Navy's 30-year plan envisioning the construction of 24 submarines in two distinct phases. The first phase, Project-75, involved the production of six Scorpène-class diesel-electric submarines in collaboration with France. Despite notable delays and cost escalations, this phase underscored the importance of technology transfer and skill acquisition.

Project-75I, the second phase, was conceived to incorporate advanced AIP technology, which allows extended underwater endurance, critical for stealth and survivability. Initially approved in 2007, bureaucratic inertia and procedural complexities delayed its execution. By 2025, however, the deal's finalization reflects the culmination of two decades of meticulous planning, negotiation, and capability assessments.

The Strategic Advantage of AIP Technology

AIP systems represent a transformative leap in submarine technology, enabling diesel-electric submarines to operate submerged for extended periods—up to two weeks—without surfacing. This capability significantly mitigates the risk of detection by adversary surveillance systems, particularly in contested maritime environments. Unlike conventional submarines that rely on diesel generators for battery recharge, AIP-equipped vessels utilize oxygen-independent mechanisms such as fuel cells or Stirling engines, ensuring minimal acoustic and thermal signatures.

Operationally, AIP technology allows submarines to maintain strategic positions for protracted durations, facilitating surveillance, intelligence gathering, and covert offensive operations. For example, German Navy's U-32, equipped with an AIP system, demonstrated the ability to traverse over 2,800 kilometers underwater without surfacing —a testament to the operational versatility such systems can offer.



India's advanced Air-Independent Propulsion (AIP) initiative is led by the Defence Research and Development Organisation (DRDO), with key contributions from the Naval Science and Technological Laboratory (NSTL). This indigenous effort, in line with "Make in India," is further supported by Mazagon Dock Shipbuilders Limited (MDL) and Larsen & Toubro (L&T).

These collaborators are responsible for integrating AIP systems—both through retrofitting platforms like INS Kalvari with an AIP plug and incorporating AIP in new Project-75I submarines—thereby ensuring that the technology meets the Indian Navy's rigorous strategic and operational requirements.

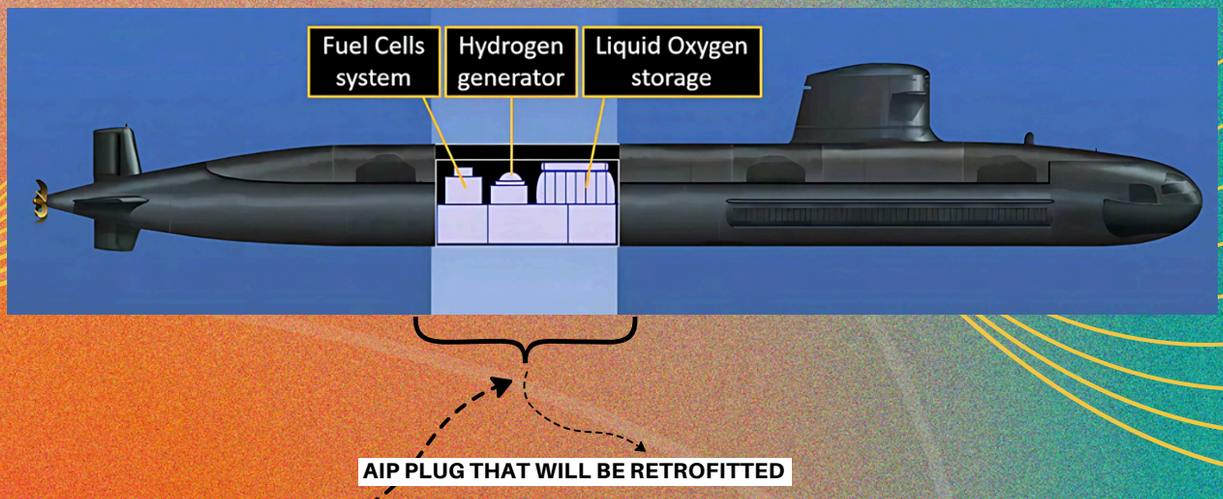
India's AIP Selection and Technological Collaboration

The P-75I program prioritizes proven AIP systems to ensure operational reliability. Among the three primary AIP types—fuel cells, Stirling engines, and closed-cycle steam turbines—India has opted for fuel cell-based systems due to their superior efficiency and scalability. ThyssenKrupp Marine Systems (TKMS), a German defence conglomerate, has emerged as the primary technology partner, offering its advanced variant of the Type 214 submarine, which features a robust AIP module.

India's Strategic Partnership (SP) model underpins the P-75I deal, fostering collaboration between domestic firms such as Mazagon Dock Shipbuilders Limited (MDL) and Larsen & Toubro (L&T) with international technology providers. This framework ensures comprehensive technology transfer (ToT), encompassing design expertise, AIP integration, and combat system deployment. Such partnerships aim to establish a self-sustaining ecosystem for indigenous submarine production while aligning with the "Make in India" initiative.

Integration of the AIP Plug: Enhancing Underwater Endurance

In furtherance of advanced underwater capabilities, an Air-Independent Propulsion (AIP) plug has been conceptualized as a pivotal enhancement for the existing Kalvari-class submarines within the broader Project-75 framework. The term "plug" is deliberately employed to describe this engineering modification because it connotes the addition of a modular, self-contained unit that can be seamlessly "plugged into" the existing hull structure. This auxiliary hull extension is designed specifically to accommodate an indigenously developed AIP system, much like inserting a new component into a pre-existing electronic device to upgrade its functionality.



The retrofit process involves a meticulous insertion of the AIP plug during the submarines' mid-life upgrade cycle—an endeavour scheduled to commence with INS Kalvari as early as September 2025. This modification not only necessitates a precise recalibration of the vessel's structural parameters, including adjustments to its length and displacement but also substantially augments its submerged endurance from a baseline of approximately 48 hours to an extended operational window of two to three weeks. Such a transformative upgrade is anticipated to considerably enhance tactical stealth and operational versatility in contested maritime domains.

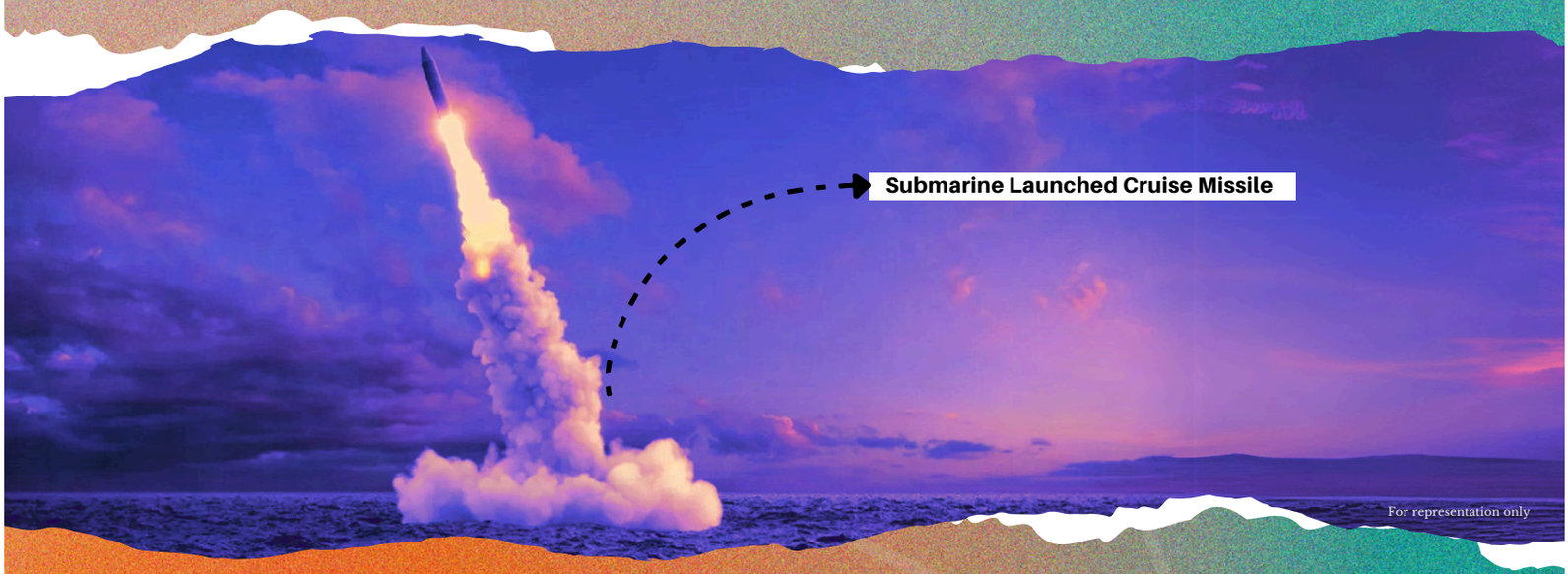
Clarification on AIP Deployment in Indian Submarine Programs

It is important to distinguish between the two approaches to integrating AIP technology in India's submarine modernization efforts. The retrofit of INS Kalvari—with the incorporation of the AIP plug—is scheduled to be executed as early as September 2025, marking the first operational instance of AIP technology within the existing Kalvari-class fleet. In contrast, the P-75I submarines are being constructed with integrated AIP systems from the outset. This design integration ensures that the new generation vessels will inherently benefit from enhanced stealth and endurance capabilities upon their delivery in the coming years.

Operational and Strategic Implications

The incorporation of AIP-equipped submarines into the Indian Navy's fleet represents a paradigm shift in its operational doctrine. With enhanced stealth, endurance, and lethality, these submarines can effectively counterbalance the expanding naval capabilities of regional adversaries such as China and Pakistan. Their ability to conduct protracted underwater operations in strategic theatres like the Indo-Pacific ensures a credible deterrent posture.

Additionally, P-75I submarines are expected to feature advanced weapon systems, including long-range land-attack cruise missiles and heavyweight torpedoes. Such capabilities enable precision strikes against high-value targets and enhance the Navy's power projection in contested maritime zones. Moreover, the integration of indigenous combat systems enhances operational customization, ensuring compatibility with existing naval assets.



Overcoming Challenges: Bureaucracy, Costs, and Timelines

Despite its strategic significance, the P-75I project has faced considerable challenges, including procedural delays, cost escalations, and stringent technological requirements. The revised project cost of ₹70,000 crore ($8.1 billion) significantly exceeds initial estimates of ₹43,000 crore, reflecting the complexities inherent in high-value defence procurements. Furthermore, the first submarine's expected delivery by 2032 underscores the protracted timelines associated with large-scale indigenous projects.

Navigating these challenges requires streamlined decision-making processes, enhanced private sector participation, and robust oversight mechanisms. The establishment of a dedicated project management office within the Ministry of Defence could facilitate real-time monitoring and accountability, ensuring adherence to deadlines and budgets.

Conclusion: A Vision for the Future

The P-75I submarine deal encapsulates India's aspirations for a self-reliant and technologically advanced naval force. By integrating state-of-the-art AIP systems and fostering indigenous production capabilities, this project strengthens India's strategic autonomy while addressing critical operational gaps. As the Indian Navy confronts evolving maritime threats, the P-75I submarines will serve as a cornerstone of its underwater fleet, enhancing both deterrence and power projection in an increasingly contested Indo-Pacific theatre.

PULSE STRATEGIC | INDIAN NAVY

1. Keel Laying of Fleet Support Ship for Indian navy, November 14, 2024

On November 14, 2024, the Indian Navy marked a significant milestone with the keel-laying ceremony of its first Fleet Support Ship (FSS) at Hindustan Shipyard Limited in Visakhapatnam. Presided over by Vice Admiral B. Siva Kumar, Controller of Warship Production & Acquisition, this event signifies a pivotal advancement in bolstering the Navy's logistical capabilities. The FSS is designed to enhance the Navy's operational endurance by providing underway replenishment to combat vessels, thereby extending their mission durations and operational reach. This development underscores India's commitment to self-reliance in defense manufacturing and its strategic focus on sustaining maritime operational readiness.

2. Commissioning of INS Tushil in Kaliningrad, Russia, December 9, 2024

In a significant augmentation of its surface fleet, the Indian Navy commissioned INS Tushil, a stealth-guided missile frigate, on December 9, 2024. Constructed at the Yantar Shipyard in Kaliningrad, Russia, INS Tushil is the seventh ship of the Talwar-class frigates and the first of the third batch ordered by the Indian Navy. The vessel embarked on its maiden operational deployment on December 17, 2024, navigating through strategic maritime routes and engaging in joint exercises with allied navies. This deployment not only enhances maritime cooperation but also projects India's naval presence across critical sea lanes.

3. Triumphant Tri-Commissioning of 3 Indian Navy Vessels, January 15, 2025.

In an unprecedented event on January 15, 2025, the Indian Navy simultaneously commissioned three formidable platforms at the Naval Dockyard in Mumbai: the stealth-guided missile destroyer INS Surat, the stealth frigate INS Nilgiri, and the diesel-electric attack submarine INS Vaghsheer. This historic tri-commissioning underscores India's burgeoning indigenous shipbuilding capabilities and its strategic resolve to bolster maritime security.All the boats were manufactured at Mazagon Dock Shipbuilders Ltd.

4. Project 75I Submarine Deal Advances, January 23, 2025

On January 23, 2025, a significant development occurred in India's Project 75I, aimed at augmenting the Navy's submarine fleet. A joint venture between Germany's ThyssenKrupp Marine Systems and India's Mazagon Dock Shipbuilders Limited emerged as the sole contender for the $5 billion contract to construct six advanced conventional submarines. These submarines are expected to feature Air-Independent Propulsion (AIP) technology, enabling prolonged underwater endurance and enhancing the Navy's operational capabilities.

5. TROPEX 2025 – A Display of Maritime Dominance, February 8, 2025

The Theatre Level Operational Readiness Exercise (TROPEX) 2025 commenced on February 8, 2025, showcasing the Indian Navy's extensive maritime capabilities. The exercise witnessed the mobilization of 65 warships, 9 submarines, and over 80 aircraft, including the indigenously built aircraft carrier INS Vikrant, Visakhapatnam-class destroyers, and Kalvari-class submarines. TROPEX 2025 underscores the Navy's preparedness to safeguard national interests across the vast expanse of the Indian Ocean Region.

PINAKA: INDIA'S INDIGENOUS ROCKET ARTILLERY SUCCESS STORY

Ms. Amita Pilania
Student, AIDSS,
AMITY NOIDA

"The development and induction of the Pinaka rocket system stand as a testament to India's commitment to advanced indigenous defence technology"
~Dr. V.K. Saraswat, Former DG of DRDO

India's defence sector has long strived for self-sufficiency, yet few indigenous projects have exemplified this aspiration as effectively as the Pinaka Multi-Barrel Rocket Launcher (MBRL) system. A testament to India's strategic foresight, technological prowess, and evolving defence-industrial base, Pinaka represents a landmark achievement in modern artillery warfare. From conceptualization in the 1980s to battlefield deployment and recent technological enhancements, the system has demonstrated a trajectory of continuous innovation, solidifying its place as a formidable force multiplier for the Indian military.

The Pinaka system belongs to the class of Multiple Launch Rocket Systems (MLRS), which have revolutionized modern artillery engagements. Unlike traditional towed artillery that relies on sustained fire over time.MLRS platforms, such as Pinaka, provide rapid, high-intensity bombardment over vast areas, making them indispensable for area-denial and suppression missions. With the ability to fire a full salvo within seconds, Pinaka enhances the Indian Army's operational tempo and survivability through its shoot-and-scoot capability, allowing launchers to relocate immediately after firing and thus evade counter-battery strikes. This agility, combined with its lethal firepower, makes Pinaka a critical asset in high-intensity conflicts and border skirmishes, particularly in mountainous and high-altitude terrains where static artillery positions are vulnerable.

From Concept to Combat: The Evolution of Pinaka

The origins of Pinaka can be traced back to the late 1980s, when India sought an indigenous replacement for the Soviet-era BM-21 Grad rocket launchers. The Defence Research and Development Organisation (DRDO) spearheaded the program, with key research and manufacturing inputs from the Armament Research and Development Establishment (ARDE), Research Centre Imarat (RCI), and the Defence Research and Development Laboratory (DRDL). Unlike many indigenous defence projects that faced bureaucratic inertia and technological hurdles, Pinaka benefitted from an efficient development cycle, owing to seamless coordination between state agencies and private-sector partners.

A defining moment in Pinaka's history was its battlefield debut during the Kargil War of 1999. Operated under extreme high-altitude conditions, the system proved its mettle by effectively neutralizing enemy positions and fortifications. The war not only validated the system's combat efficacy but also underscored the importance of indigenous artillery solutions in addressing India's unique operational challenges. Since then, the Pinaka system has undergone multiple iterations, incorporating extended range, improved accuracy, and enhanced mobility, culminating in the latest Guided Pinaka variant.

The Role of Private Industry: A Force Multiplier in Defence Manufacturing

One of Pinaka's defining successes has been its effective integration of private industry into India's traditionally state-dominated defence sector. Unlike previous projects that relied exclusively on government-run entities, Pinaka was developed in collaboration with leading private firms such as Tata Advanced Systems Limited (TASL), Larsen & Toubro (L&T), and Munitions India Limited. These partnerships accelerated the production cycle, introduced advanced precision engineering techniques, and enhanced cost efficiency—factors critical to maintaining both domestic defence readiness and international competitiveness.Private-sector involvement has also fostered a scalable production ecosystem, reducing import dependency and ensuring that India remains self-reliant in critical military technologies. By streamlining logistics and manufacturing processes, the Pinaka program has become a model for future indigenous weapons development, demonstrating that a well-coordinated public- private partnership can yield cutting-edge, combat-ready platforms.

Technological Advancements: The Emergence of Guided Pinaka

Pinaka's evolution from a conventional MLRS to a precision-strike system underscores India's commitment to enhancing indigenous defence capabilities. The latest iteration, the Guided Pinaka, marks a significant leap forward, featuring an extended operational range of 75 km, nearly doubling its predecessor's reach. This enhancement is coupled with a sophisticated guidance package that integrates inertial navigation and satellite-based targeting, ensuring greater accuracy and effectiveness in modern battlefield scenarios.

The integration of advanced warheads further augments the system's lethality, enabling precision strikes against enemy fortifications, command centres, and logistical hubs. With a series of successful test firings validating these enhancements, the Guided Pinaka is now set for large-scale production, reinforcing its role as a critical component of India's artillery modernization strategy.

Strategic Export Potential and Global Interest

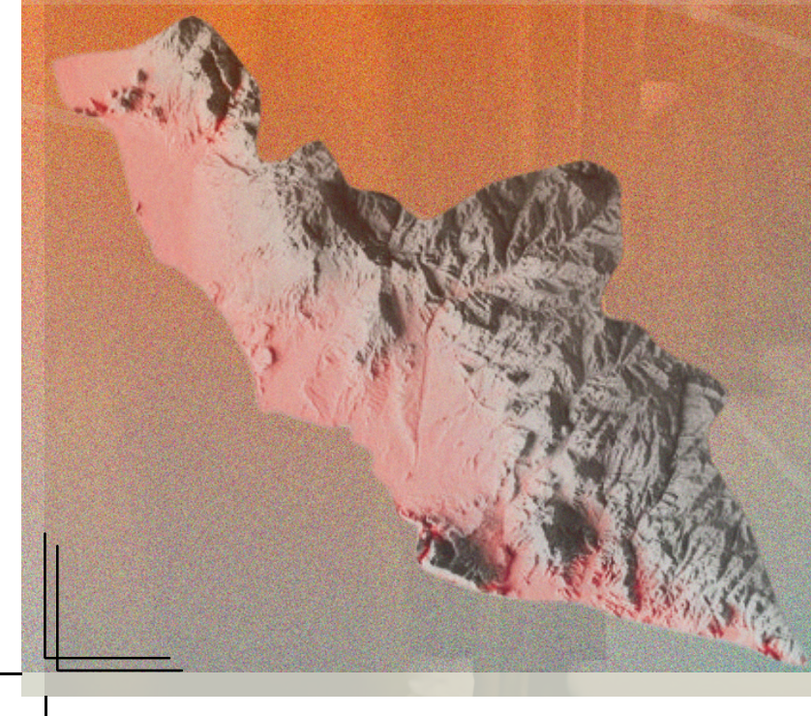
Beyond strengthening India's domestic artillery capabilities, the Pinaka system has also emerged as a key instrument in India's defence export ambitions. The system's first international sale to Armenia in 2022 underscored its battlefield reliability and operational effectiveness, positioning India as an emerging player in the global arms market. This deal not only strengthened Indo-Armenian defence ties but also signalled India's intent to challenge traditional Western and Russian dominance in the artillery domain.

In a particularly significant development, France has expressed interest in evaluating the Pinaka system, marking a notable departure from traditional Western procurement patterns. France's potential consideration of Pinaka reflects the growing credibility of Indian defence manufacturing and underscores the shifting dynamics in global military procurement. A successful French acquisition would further elevate India's status as a reliable defence exporter, paving the way for expanded sales to regions such as Southeast Asia, Africa, and Eastern Europe.

Conclusion: A Pillar of India's Future Defence Strategy

Pinaka's success story exemplifies the broader transformation of India's defence industry—a shift from dependency on imports to self-reliance on cutting-edge military technology. The system's continuous evolution, from a conventional MLRS to an extended-range precision-strike weapon, aligns seamlessly with India's long-term strategic objectives under the Atmanirbhar Bharat initiative. Moreover, its growing export footprint highlights the potential for India to emerge as a significant player in the global arms trade, thereby strengthening both economic and geopolitical standing.

More than just an artillery platform, Pinaka represents a paradigm shift in India's approach to defence innovation and self-sufficiency. By leveraging indigenous research, fostering private-sector collaboration, and expanding global defence partnerships, India has set a precedent for future military programs. As Pinaka continues to evolve and attract international buyers, it will not only enhance India's strategic capabilities but also reinforce its position as a formidable force in global military affairs.



PULSE STRATEGIC | INDIAN AIRFORCE

1. Indian Air Force and Republic of Singapore Air Force Conduct Joint Military Training, November 13 to 22, 2024.

The Indian Air Force (IAF) and the Republic of Singapore Air Force (RSAF) conducted the 12th edition of their Joint Military Training at Air Force Station Kalaikunda, West Bengal. The exercise aimed to enhance defense cooperation and featured advanced air combat simulations, joint mission planning, and debriefing sessions. The RSAF participated with eight F-15SGs, eight F-16s, one G550 Airborne Early Warning aircraft, and over 300 personnel, training alongside the IAF's Rafale and Su-30 MKI aircraft. This collaboration strengthened interoperability and combat readiness between the two air forces

2.Parliamentary Panel Addresses Indian Air Force Squadron Shortage, December 2024

In December 2024, a parliamentary panel reported that the Indian Air Force's combat fleet strength stood at 31 squadrons, below the minimal requirement of 42. The shortfall is attributed to the retirement of aging aircraft without immediate replacements. The report highlighted ongoing efforts to mitigate the impact through various procurement programs.

3.Govt Allocates Rs 48,614 Crore for Advanced Aircraft and Aero Engines in Defence Budget, Enhancing IAF Capabilities Amidst Dwindling Squadrons,4th February 2025

In a move aimed at bolstering India's air power, the government has earmarked a substantial ₹48,614 crore in the upcoming defence budget specifically for the acquisition and development of advanced aircraft and aero engines. This investment underscores a commitment to modernizing the Indian Air Force (IAF) amidst concerns over its dwindling fighter squadrons.The allocation reflects a two-pronged strategy: procuring cutting-edge aircraft and fostering self-reliance in critical engine technology. This aligns with the 'Make in India' initiative, promoting domestic manufacturing and reducing dependence on foreign suppliers.

4. Indian Air Force Conducts First Night Landing at Agatti Airport, On December 26, 2024,

Indian Air Force AN-32 aircraft successfully executed the first night landing at Agatti Airport in Lakshadweep. This operation demonstrated the IAF's enhanced operational capabilities and its commitment to extending reach to remote and strategically important regions.

5.Induction of C-295 Transport Aircraft Enhances IAF's Tactical Airlift Capabilities, January 30, 2025

The Indian Air Force inducted its first C-295 transport aircraft at the Agra Air Force Station. The ceremony included a flypast featuring the C-295 flanked by two Su-30MKI fighter jets and a water-cannon salute. This addition is expected to bolster the IAF's tactical airlift capabilities, particularly in transporting troops and equipment to remote and challenging terrains. The induction marks a significant step in modernizing the IAF's transport fleet.

ASSAD'S DOWNFALL

UNLEASHING A PARADIGM SHIFT IN GLOBAL SECURITY

Mr. Kabeer Ghose
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NOIDA

The political crisis in Syria, centred around the 'controversial' rule of President Bashar al-Assad, has been one of the most defining conflicts of the 21st century. His ousting by the Hay'at Tahrir al-Sham (HTS) and other rebel groups on December 8, 2024, marks the beginning of another chapter which exemplifies the continued instability in the West Asian region. The international community must understand the complexities involved if it intends to engage with the interim president Ahmed al-Sharaa, also known by the nom de guerre Abu Mohammad al-Julani.

Troubled Waters

In order to ensure that the volatile region does not become an open field for the Islamic State to again establish its Caliphate, it becomes imperative to understand the events which unfolded in November and December 2024. The 'lightning-advance' of the rebel groups against the Assad regime, which toppled it on December 8, 2024, has direct links to the 2011 Arab Spring movements which led to a decade long civil war. Syria has been a focal point of great power politics, with the United States (US) and Russia adopting opposing stances.

Russia, which has been a staunch supporter of Assad, would likely view his removal as a strategic loss, potentially forcing it to do an assessment of its military presence in the region, whereas the US and its allies might perceive his ouster as a victory against authoritarianism. Syria as a piece of the regional chessboard becomes even more complicated due to strong presence of fundamentalist terrorist organizations like the ISIS, the Al Qaeda and their affiliates.

Although some observers may claim them to be weakened and diminished due to concerted efforts of the US, its allies and the Syrian Democratic Forces, others reiterate that these groups can resuscitate given the opportunity and point towards the continuing strong presence of ISIS and its fighters in northeastern Syria. The implications of the sudden removal of Assad for Syrian governance are immense. The post-Saddam Iraq and post-Gaddafi Libya actually suggest that the sudden removal of an authoritarian leader without a structured transition leads to lawlessness.

Though Ahmed al-Sharaa had distanced himself from Al Qaeda, observers and military analysts around the world are deeply concerned about the possible resuscitation of Al Qaeda and other affiliated entities and groups posing a significant threat to the regional and global security.

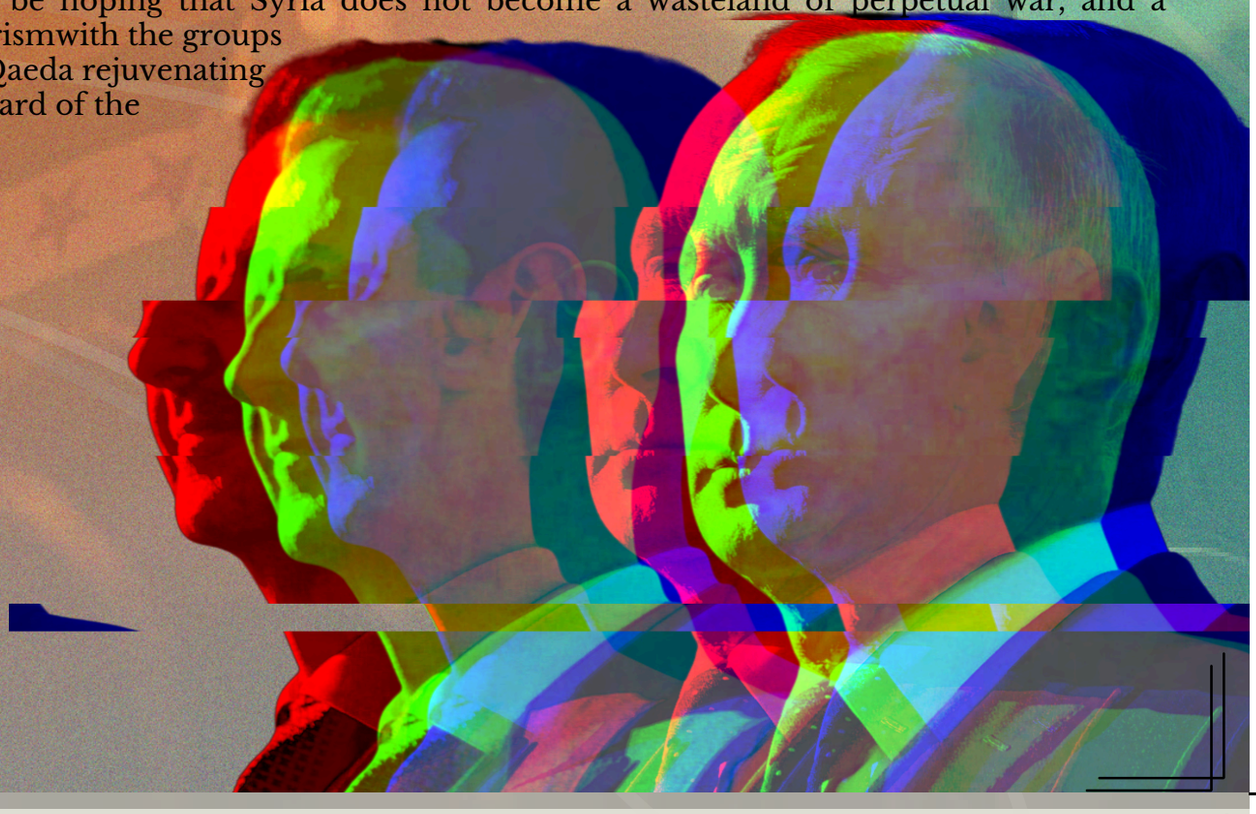
Further, Assad's ouster could possibly reshape the entire West Asia's geopolitical landscape. Syria has been a critical ally of Iran and a key sector in the so-called Shia Crescent, that extends from Tehran to Beirut. A regime change would weaken the Russian and Iranian influence and embolden Saudi Arabia, Israel and Türkiye to expand their influence. The same was evident from the events that unfolded as soon as Assad fled, and the IDF (Israeli Defence Forces) extending its military presence beyond the Golan Heights, further into southern Syria and capturing strategic military installations.

Further, as the Israeli defence minister Israel Katz confirmed on January 28, 2025, Israeli troops could remain in southern Syria indefinitely to prevent the hostile forces from exploiting the power vacuum following Assad's ouster. As far as Türkiye is concerned, it has been a well established fact by now that it actively supported anti-Assad factions. Hence it might seek to expand its influence in northern Syria.

Humanitarian considerations

Syria, a country which has been a focal point of great power politics with both the United States and Russian Federation adopting opposing stances, has suffered one of the worst humanitarian crises in modern history. With millions displaced both internally as well as externally, the transition period following Assad's ouster would likely lead to further displacement and human suffering, unless a well-coordinated international humanitarian response is implemented.
The European Union (EU) foreign ministers' nod to begin easing sanctions on Syria after the ouster of Bashar al-Assad indicates that the West looks to build bridges with the war-ravaged country's new leadership. These sanctions go back in date to the period when the Syrian civil war was at its peak. EU's foreign affairs representative Kaja Kallas said, "This could give a significant boost to the Syrian economy and help the country get back on its feet." Yet, she also noted that "while we aim to move fast, we also are ready to reverse the course if the situation worsens, and in parallel, we will scale up humanitarian aid and recovery efforts". This shows Europe's willingness to help in the reconstruction of Syria and possibly have better ties with the future Syrian leadership. However, it must not be forgotten that Syria's interim President Ahmed al-Sharaa, and the Islamist group, i.e., the Hay'at Tahrir al-Sham remain under EU sanctions.

Although the lifting of sanctions temporarily might give a boost to Syrian economy which already is in shambles, the human suffering would continue unless the sanctions are completely lifted. Ironically, all the sanctions that exist today were imposed on Syria during the Assad regime, which no longer exists. Some might dismiss this is as wishful thinking, citing the nature of political instability of the region which is already affected badly after the events of October 7, 2023, which marked the beginning of the Israel-Hamas war in Gaza. Yet, security analysts around the globe would be hoping that Syria does not become a wasteland of perpetual war, and a brewery of terrorismwith the groups like ISIS and Al Qaeda rejuvenating to hoist the standard of the caliphate.



Conclusion

Only time will tell whether the removal of Assad would provide an opportunity for democratic reforms or the authoritarian rule would continue under the new regime. What's important is that the international community must be prepared to manage the forthcoming challenges because Syria's further descent into chaos post Assad shall have serious consequences for regional as well global security.

> **"The fall of the regime is a fundamental act of justice. It's a moment of historic opportunity for the long-suffering people of Syria to build a better future for their proud country."**
>
> **~President Joe Biden**

STRATEGIC PULSE

R&D AND ATMANIRBHARTA

1.DRDO Successfully Tests Long-Range Hypersonic Missile

On November 16, 2024, the Defence Research and Development Organisation (DRDO) conducted a successful flight trial of India's first long-range hypersonic missile off the Odisha coast. The missile demonstrated the capability to travel at speeds exceeding Mach 5, significantly enhancing India's strategic strike abilities. This achievement places India among a select group of nations possessing advanced hypersonic technology.

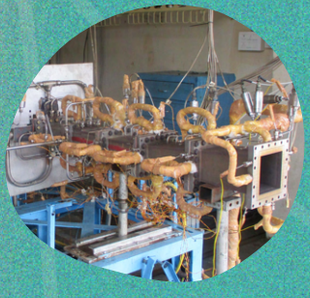
2.DRDO Transfers Medium Range-Microwave Obscurant Chaff Rocket to Indian Navy

On December 26, 2024, the Defence Research and Development Organisation (DRDO) handed over the Medium Range-Microwave Obscurant Chaff Rocket (MR-MOCR) to the Indian Navy. This advanced system enhances naval defense by creating a microwave obscurant cloud, effectively reducing the radar cross-section of ships and providing protection against enemy radar-guided missiles. The successful transfer marks a significant advancement in indigenous electronic warfare capabilities.

3.DRDO Successfully Tests Nag Mk 2 Anti-Tank Guided Missile

On January 13, 2025, the Defence Research and Development Organisation (DRDO) successfully conducted field evaluation trials of the indigenously developed Nag Mk 2, a third-generation anti-tank guided missile. The tests, carried out at the Pokhran Field Firing Range, demonstrated the missile's "fire-and-forget" capability, effectively engaging targets at both minimum and maximum ranges. The Nag Mk 2, featuring enhanced maneuverability and an improved range, is now ready for induction into the Indian Army.

4. DRDO Successfully Conducts Ground Test of Scramjet Engine



On January 21, 2025, DRDO successfully conducted a 120-second ground test of an active-cooled scramjet engine at its DRDL facility in Hyderabad. The test demonstrated stable combustion at supersonic speeds over 1.5 km/s, marking a critical step in India’s hypersonic missile development.Indigenous innovations, including endothermic scramjet fuel and advanced thermal barrier coatings, were also validated. Defence Minister Rajnath Singh hailed the achievement as a major milestone in advancing India’s self-reliant hypersonic technology program.

5. India Explores NASAMS Acquisition to Strengthen NCR Air Defense

India's efforts to strengthen air defense in the National Capital Region (NCR) have highlighted the potential acquisition of the National Advanced Surface-to-Air Missile System (NASAMS). Jointly developed by Raytheon (U.S.) and Kongsberg (Norway), NASAMS offers layered defense capabilities and was first deployed in Washington, D.C., post-9/11. India initiated talks with the U.S. for its deployment in 2018, but the sale was never finalized. Despite advancements in India's Ballistic Missile Defense program, gaps remain in countering drone threats. Experts emphasize that adopting NASAMS could bolster NCR's security and enhance India-U.S. defense cooperation.

JANUARY ISSUE
2025

EXPLORING THE NEW AGE OF WAR
ISSUE
N.002

PINAKA

MULTI-BARREL ROCKET LAUNCHER

THE WEAPON WATCH

Mr. Barshan Karmakar
Ph.D. Scholar, AIDSS.

WEAPON WATCH /RAKSHA DRISHTI

- **Developed By-** ARDE (Armament Research and Development Establishment)
- **Manufactured By-** DRDO (Defence Research Development Organization), Tata Advanced Systems, and the Ordnance Factories Board (OFB).
- **Length- 2.91–5.17 m (9 ft 7 in – 17 ft 0 in)**
- **Diameter-** 122–214 mm (4.8–8.4 in)
- **Caliber**- 122 mm (4.8 in) (ERR 122), 214 mm (8.4 in) (Pinaka Mk-I, Mk-I Enhanced, Mk-II, Mk-II ER)

- **Effective Firing Range**- 37.5 kms to 75 kms
- **Maximum Firing Range**- 90 kms
- **Weight of Warhead**- 100 kg (220 lb) to 250 kg (550 lb)
- **Payload Capacity**- 22 Tonnes
- **Operational Range**- ~ 800 km
- **Accuracy**- ≤ 1.5% range for Pinaka Mk-I, ADM, Mk-I Enhanced & Mk-II ≤ 60m and <30m CEP, with Trajectory Correction System for Guided Pinaka ≤ 1.5% range for ERR 122

- **Number of Barrels**- 12
- **Elevation**- 55-degrees
- **Traverse**- 90-degrees
- **Rate of Firing**- Salvo of 12 rockets per launcher or 72 rockets per battery under 44 seconds.

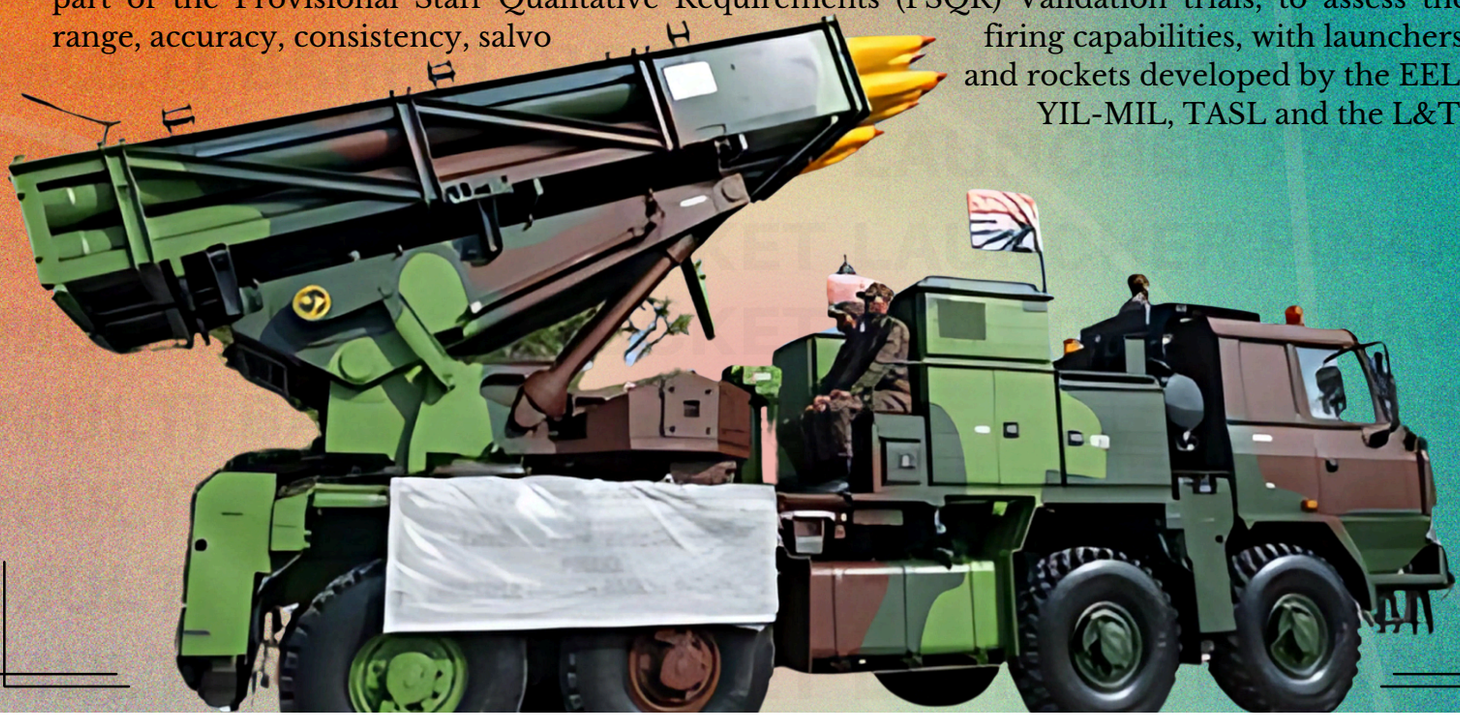
WEAPON WATCH /RAKSHA DRISHTI

The Pinaka Multi-Barrel Rocket Launcher is a highly tested, battle-proven, all-weather capable Weapon System used by the Indian Army's Regiment of Artillery. The development of the Pinaka MBRL is a testament to the growing public-private partnership in India's Defense Ecosystem between the major defense production and research units like the DRDO (Defence Research Development Organization) and the TASL (Tata Advanced Systems Limited). The main objective with which this system was developed is to deliver a large volume of firepower in a short time to strike sensitive targets. The fast-reloading capability and high-pointing accuracy enables the Pinaka MBRL to deliver a large volume of firepower against critical enemy targets in a short time. The launcher system is supported by four hydraulically actuated outriggers while firing, which are pivoted upon a revolving base with two pods mounted on either side. Each of the pods contains 6 launcher tubes to load the rockets on a 2x3 matrix. The Pinaka MBRL holds a maximum range of 45 kms (Mark-1) and 90 kms for the Mark-2 version, with being able to fire a salvo of 12 rockets per launcher in 44 seconds.

Developmental History

According to the religious scriptures of Hinduism, Pinaka is known as the Celestial Bow of the Hindu Deity Shive. The Pinaka MBRL is also known as the Indian version of the Russian Grad, as some of its characteristics are derived from it, which is also operated by the Indian Army. The operational variation of both the Pinaka and the Russian-made BM-21 Grad is based on the mechanism of a Barrage or Massed Artillery System.

Referring to the origin of the system back in 1981, when the Indian Army placed the need to acquire long-range artillery systems. In July 1983 the Indian Army formulated the General Staff Qualitative Requirement (GSQR) for this system. Between the 1990s to 1999, the Pinaka MBRL underwent its initial tests with the Mk-I in the 1990s. In 1999 user trials were conducted, following which the systems were deployed into action during the Kargil Conflict in the same year. The subsequent development and trial of the Mk-II variants began in 2013. In 2017 the systems demonstrated an enhanced firing range of 75 km and in 2019 the Mk-II variant showcased a firing range of 90 km, further leading to the development of an enhanced version of the Pinaka Mk-I variant. However, this enhanced version saw the test of smaller rockets in salvo modes. In 2022, these enhanced versions and the ADM variants underwent comprehensive user trials along with production and testing by the EEL and Yantra India Ltd-Munitions India Ltd. (YIL-MIL). Finally, in 2024, the Guided variant of the Pinaka MBRL completed its final tests as a part of the Provisional Staff Qualitative Requirements (PSQR) Validation trials, to assess the range, accuracy, consistency, salvo firing capabilities, with launchers and rockets developed by the EEL, YIL-MIL, TASL and the L&T.



Operational Performance of the Pinaka MBRLs

The Pinaka Multi Barrel Rocket Launcher (MBRL) system is a highly advanced artillery system designed for precision, lethality, and rapid deployment. The systems are equipped with six launcher vehicles, each carrying 12 rockets. The systems integrate six loader-replenishment vehicles, three replenishment vehicles, and two command post vehicles, one of which serves as a standby unit. Each launcher contains an onboard fire control computer and AGAPS (Automatic Gun Alignment and Positioning System) to ensure precise land navigation and orientation without the need for separate survey teams. The Rockets of the Pinaka MBRL demonstrate exceptional accuracy with free-flight rockets achieving a consistency of 1.5% of their range and guided rockets to maintain a circular error probable (CEP) of less than 60 meters. The shoot-and-scoot capability also allows rapid repositioning to evade counter-battery fire, whereby its automated features also help to ensure swift deployment to response-to-fire calls. The Pinaka MBRL is also capable of saturating a square kms with 72 rockets in 44 seconds, whereby it can deliver a devastating impact over a 1000 by 800-meter area. The mobility is also enhanced by the commonality of the TATRA 8x8 carrier vehicles across the system to ensure seamless logistical support.

Operators and Export Success

Considering the operational performance and the effectiveness shown by the Pinaka MBRL, it has attracted review for trials and exports. But, various considerations like geopolitical factors, technology transfer, end-user certification and operational compatibility to all international arms trade regulations and agreements count for ensuring a successful strategic trade.
In 2022 Armenia acquired 4 Batteries of the Pinaka MBRL alongside other defense equipments from India. This procurement also included provisions for an extended range of guided rockets for the Pinaka, which were finally delivered in 2023. The Pinaka was also deployed in frontline action during the Armenia-Azerbaijan Nagorno Karabakh War in 2020.
Recently Indonesia and Nigeria have also shown their interest in the Pinaka MBRL. But this system again came to the forefront of attraction in 2024, when the French Army selected it for evaluation trials as a result of acquiring new Multi-Barrel Rocket Launcher systems.

STRATEGIC PULSE

DEFENCE ACQUISITIONS

India to Purchase $4 Billion Wall-Like Radar to Counter Chinese Threats from 6,000 km"

India and Russia are finalizing a $4 billion defense deal for the Voronezh radar system, a key asset to bolster India's air defense. Developed by Almaz-Antey, the radar has a detection range exceeding 8,000 km and will enhance India's ability to monitor threats across South Asia and the Indian Ocean. Aligned with the "Make in India" initiative, 60% of the system will be locally produced. Despite U.S. CAATSA sanctions, India continues to balance ties with Russia and the U.S., strengthening its defense infrastructure while promoting indigenous manufacturing.

2.DRDO Transfers Medium Range-Microwave Obscurant Chaff Rocket to Indian Navy

In January, A joint venture between Germany's ThyssenKrupp and India's Mazagon Dock Shipbuilders Ltd emerged as the sole contender for a $5 billion contract to build six advanced AIP based submarines for the Indian Navy. Successful field trials led to scheduled commercial negotiations. This deal ig going to bloster India's Underwater Stealthiness as it will allow the Submarines to stay longer upto 2 weeks without the the need of snorkling or surfacing.

3.CABINET APPROVES PINKA 10,000 CR. DEAL TO BLOSTER BODER DEFENCE

The Cabinet Committee on Security approved the acquisition of Pinaka rocket ammunition, valued at ₹10,200 crore (approximately $1.4 billion). The order includes contracts for different ammunition variants to equip ten Pinaka regiments, enhancing the Indian Army's artillery capabilities.This news shows, India Army's support and trust for Indegenous systems that are on par with the global standards. The Pinaka has gained international recognition, with countries like Armenia placing orders.

4. DRDO Successfully Conducts Ground Test of Scramjet Engine

the U.S. State Department approved a $1.17 billion sale of MH-60R Seahawk helicopter equipment and support to India in December 2024. The sale is part of the U.S. Foreign Military Sales (FMS) program. The sale will help India improve its anti-submarine warfare and maritime capabilities. It will also enhance India's naval operations in the Indo-Pacific region. The sale will strengthen India's defense preparedness.

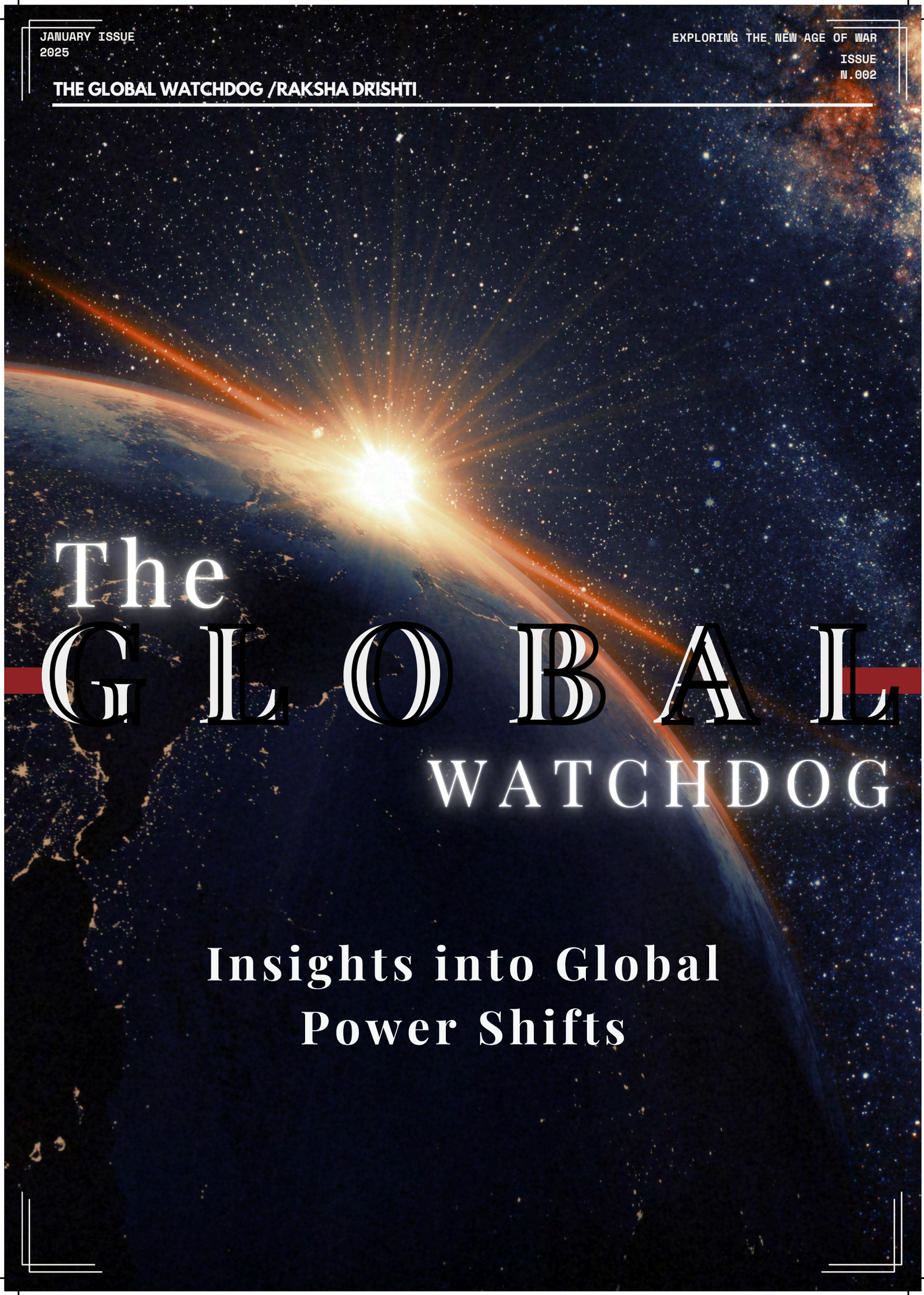
5. Indian Navy Inducts Final 6th Scorpene Submarine INS Vagsheer

In a landmark ceremony held in Mumbai on February 10, 2025, the Indian Navy commissioned INS Vagsheer, the sixth and final submarine of its indigenous Scorpene (Kalvari) class. The event was attended by top naval officials and dignitaries, marking a significant milestone in India's drive for self-reliance in defense manufacturing.Built by Mazagon Dock Shipbuilders in collaboration with France's Naval Group, INS Vagsheer boasts advanced stealth features, cutting-edge sonar systems, and integrated weaponry designed to counter emerging maritime threats in the Indian Ocean Region. The induction of this state-of-the-art platform further enhances India's undersea warfare capabilities.

JANUARY ISSUE
2025

THE GLOBAL WATCHDOG /RAKSHA DRISHTI

EXPLORING THE NEW AGE OF WAR
ISSUE
N.002



The GLOBAL WATCHDOG

Insights into Global Power Shifts

INDIAN OCEAN REGION

INDIA

1. India and France held a Maritime Cooperation Dialogue in New Delhi, where they agreed to strengthen collaboration between their maritime assets and organizations in the IOR to counter various forms of illegal maritime activities, such as piracy, maritime terrorism, and the smuggling of contraband. Additionally, they will address challenges like illegal, unreported, and unregulated (IUU) fishing, hybrid and cyber security threats, as well as marine pollution in the maritime region. Both nations emphasised the importance of ensuring free and secure access to sea lanes of communication.

In a significant boost to its maritime defense, the Indian Navy commissioned three key platforms - the guided-missile destroyer INS Surat, the stealth frigate INS Nilgiri, and the diesel-electric submarine INS Vagsheer This move is part of India's strategy to counter China's expanding naval footprint in the IOR, crucial for India's security and economy. India's modernisation drive includes constructing 60 ships in domestic shipyards, with plans to induct 31 more, such as next-generation frigates, corvettes, and stealth submarines. Among those under construction is the Russian-built frigate INS Tushil, expected to reach India soon after crossing multiple seas. Another Russian frigate, INS Tamal, is scheduled for delivery by 2025.

INDONESIA

2. India and Indonesia have intensified their naval cooperation to protect and advance shared interests in the IOR. The maritime defence partnership is a key element of their common Indo-Pacific vision, further reinforced by the visit of the Indonesian President to India. Their growing collaboration includes Indian Navy ships making port calls at Indonesian ports, training Indonesian military personnel in India, and increasing joint exercises. The 43rd India-Indonesia Coordinated Patrol, conducted from 10-18 December along the International Maritime Boundary Line (IMBL), showcased the strengthening maritime ties between the two nations.

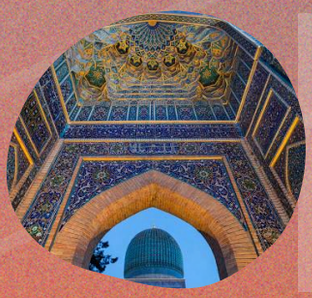
SRI-LANKA

3. China has announced plans to invest USD 3.7 billion in Sri Lanka, marking the island nation's largest-ever foreign investment. This substantial investment will be used to build a state-of-the-art oil refinery in Hambantota. The announcement came as China and Sri Lanka signed a new agreement to upgrade their Belt and Road Initiative (BRI) cooperation during Sri Lankan President Anura Kumara Dissanayake's state visit to China. The visit was described as a "significant milestone," securing the country's largest foreign direct investment to date through the Chinese-funded refinery project.

MALDIVES

4. Chinese Foreign Minister Wang Yi made a surprise visit to the Maldives and met President Mohamed Muizzu to discuss bilateral relations, especially as the Maldives strengthens ties with India. This marked the first high-level Chinese visit since Muizzu's trip to China in January 2024. Muizzu urged fast-tracking infrastructure projects under existing agreements, focusing on social housing and road development. He welcomed the surge in Chinese tourists as the largest visitor group. Wang praised Muizzu's development vision and assured China's continued support for the Maldives' sustainable development and ongoing projects.

CENTRAL ASIA REGION



UZBEKISTAN

1. Uzbekistan is moving to diversify trade routes that bypass Russia, with a five-year plan outlined by President Shavkat Mirziyoyev focusing on expanding the Middle Corridor connecting China to Europe via the Caspian Sea. The plan aims to reduce transportation costs, improve logistics, and decrease reliance on Russian trade routes. Key upgrades include expanding truck stops and improving border crossings at Davut-ota, Gisht Kuprik, and Navoi. Transport Minister Ilkhom Makhkamov highlighted plans to improve connections with Afghanistan and Turkmenistan to boost trade with Iran, Turkey, and Azerbaijan, while aligning these efforts with the newly launched Kyrgyz-Uzbek-China railway.

CHINA

2. China has strengthened its position as the dominant economic power in Central Asia, with trade turnover growing nearly 5% in 2024 to $94.8 billion, surpassing Russia as the region's top trade partner. Chinese exports to Central Asia totalled $64.2 billion, while imports amounted to $30.6 billion, largely consisting of natural resources, precious metals, and foodstuffs. Kazakhstan remained China's top trade partner, with trade rising 7% to $43.8 billion. Kyrgyzstan recorded the highest growth, with bilateral trade increasing 15% to $22.7 billion, reflecting China's expanding influence in the region.

TAJIKISTAN

3. Tajikistan, Central Asia's poorest nation, holds vast reserves of rare earths and minerals essential for the global digital economy. Mukhtar Fazilzoda, head of the state geological service, announced the discovery of 15 new deposits in December. These resources, mainly in the mountainous eastern regions, are difficult to access due to harsh natural conditions. Recent technological advancements made surveying possible. Fazilzoda emphasized the need for further studies to determine the size of deposits, including lithium, and attract foreign investment and expertise for mining and development.

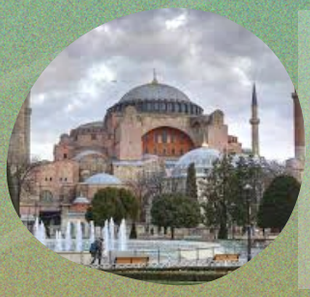
KAZAKHSTAN

4. Following last year's referendum supporting nuclear energy, Kazakhstan is rapidly advancing plans to build at least two nuclear reactors. President Kassym-Jomart Tokayev aims to create a "nuclear cluster" to drive economic growth. The Prime Minister Olzhas Bektenov stated that the government is close to finalizing an agreement for the construction of the first nuclear plant in the Almaty region "in the near future." Meanwhile, preliminary studies are underway to identify a suitable location for a second plant, reflecting the country's growing commitment to nuclear power development.

CAR

5. The World Bank predicts slower economic growth for most CAR countries over the next two years. Kazakhstan's growth is expected to rise to 4.7% in 2025, driven by higher oil exports, but then decline to 3.5% in 2026. Tajikistan is forecasted to experience the sharpest slowdown, with growth falling from 8% in 2024 to 5% in 2026. Meanwhile, Kyrgyzstan and Uzbekistan are projected to maintain relatively stable growth at 4.5% and 5.8%, respectively. The World Bank provided no economic data for Turkmenistan.

WEST ASIA REGION



TURKEY

1.On February 4, 2025, Syria's transitional President Ahmed al-Sharaa and Turkish President ayyip Erdogan are expected to discuss a joint defense pact in Ankara. The proposed agreement includes establishing Turkish airbases in central Syria and providing training for Syria's new army. This move signifies a deepening of military cooperation between the two nations following the overthrow of Bashar al-Assad's regime.

SYRIA

2.Syrian President Bashar al-Assad has been forcibly removed from power following a rapid offensive by Hay'at Tahrir al-Sham, which seized key cities, including Aleppo and Damascus. Assad fled to Russia as rebel forces took control, leaving Syria in a state of turmoil. The collapse of Assad's regime signals a major setback for Iran's influence in the region, while Türkiye and Israel strengthen their positions. With ongoing power struggles and foreign interventions, Syria's future remains uncertain, raising concerns over political Islam's resurgence and shifting regional dynamics. The conflict's outcome will shape Syria's trajectory for years to come.

IRAN

3.On October 1, 2024, Iran launched approximately 200 ballistic missiles at Israel in retaliation for the assassinations of key figures, including Hamas leader Ismail Haniyeh and Hezbollah leader Hassan Nasrallah. The attack marked a significant escalation in the Iran-Israel conflict

PALESTINE

4.Blueprint for Trump's Plan to Redevelop Gaza revealed.Details have emerged about President Donald Trump's proposal to transform Gaza into the "riviera of the Middle East." The plan involves relocating Palestinians and redeveloping the area under U.S. oversight, aiming to reconstruct Gaza using a Build-Operate-Transfer approach. Critics have condemned the plan, citing potential violations of international law and unauthorized removal of Palestinians from their land.

WEST ASIA

5.Gulf States Reaffirm Neutrality in Iran-Israel ConflictIn October 2024, Saudi Arabia, the UAE, Qatar, Bahrain, and Kuwait declared they would not allow the United States to use their airbases for military action against Iran, reaffirming their stance of neutrality in the ongoing conflict between Tehran and Israel.The Gulf Cooperation Council is advancing plans for the Gulf Railway, a 2,177 km network intended to connect all six member states, including Kuwait, Saudi Arabia, UAE, Qatar, Bahrain, and Oman. The project aims to enhance regional connectivity and is slated for completion by 2030.

STUDENT'S FORUM

A THURSDAY CONCLAVE: A GATHERING OF MINDS

Every Thursday, students from all batches of our department, including PhD scholars, come together for a unique and enriching experience. The "Thursday Conclave" serves as a platform for open discussions, knowledge sharing, and collaborative learning, transcending academic levels. These gatherings foster a vibrant academic environment where students exchange ideas, debate contemporary issues, and present their research interests. From thought-provoking debates on global strategic affairs to informal Q&A sessions with faculty, these weekly meetings strengthen our sense of community and encourage a culture of critical inquiry. The Thursday Conclave is more than just a meeting—it's where future strategists connect, learn, and grow together.

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RAKSHA DRISHTI

Our contributors.

C O L L A B O R A T E , I N N O V A T E , E L E V A T E .

We are proud to announce that the Raksha Drsihti now critically engages with insights from students outside AIDSS too. This interdisciplinary dialogue enhances our publication's scholarly quality and embodies our core motto and for this issue we have a Feature Story from contribution from a Political Science Student pursuing a B.A. (Hons + Research) in Political Science at AISS, Amity University, NOIDA

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COVER STORY

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