India's Integrated Guided Missile Development Programme: The BrahMos Way

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The rise in India's strategic prominence could well be attributed to the management of diversities in multiple arenas of demography, including that of terrain, climate, ethnic diversity, socio-economic status, neighbourhood and the geo-political state of affairs. The geo-political scenario in the Indian subcontinent is fluid at this point of time and consequently makes for a strong case for New Delhi to assume the role of a major player in shaping the regional order in the coming period.

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Having faced significant armed conflicts with its neighbours on both the eastern and western fronts since independence, India for variety of reasons did not have a credible missile programme through which it could boast of a sturdy arsenal of missile systems. However, in what was a 'decisive shift' in missile development plans, the Indian defence forces received amazing contributions by the Defence Research and Development Organisation (DRDO) following the formation of the Integrated Guided Missile Development Programme (IGMDP). Government of India

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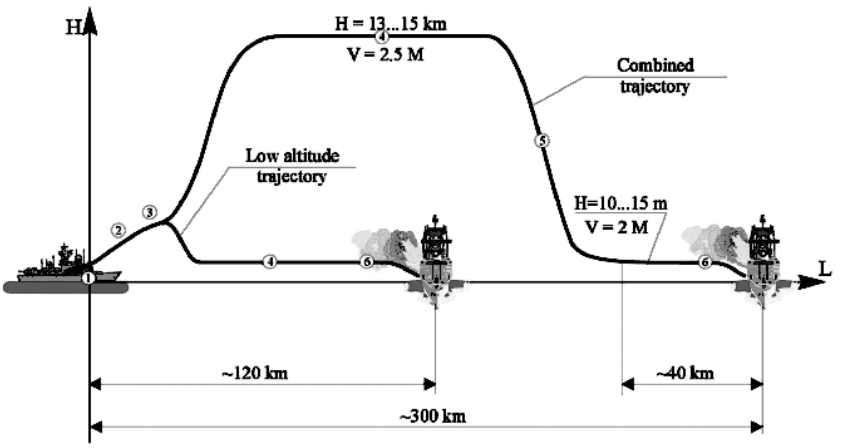
launched the IGMDP in 1983, to develop a family of strategic and tactical guided missiles, including local missile designs and development ability, and manufacture a range of missile systems for the three defence Services. The IGMDP has tasted significant success as far as two of its most significant constituents i.e., the Agni and Prithvi missile systems are concerned. However, due to their strategic nature, these were not meant for use in conventional war at theatre level. Besides, two other programmes, the Akash surface-to-surface missile (SAM) and the anti-tank Nag missile are still in development.

India was on the lookout for a long-range weapon option for the Indian armed forces that is also available to the field force commanders with meaningful accuracy to influence the outcome of operations. Thus, the BrahMos system came up with successful development of its anti-ship and anti-land target capability. BrahMos is a supersonic cruise missile that can be launched from submarines, ships, aircraft or land. Crucially, it is the fastest supersonic cruise missile in the world, at speeds of Mach 2.5 to 2.8, being about three and a half times faster than the American subsonic Harpoon cruise missile. BrahMos is the product of a joint venture between India's DRDO and Russia's NPO Mashinostroeyenia that have mutually formed the BrahMos Aerospace Private Limited. Propulsion is based on the Russian Yakhont missile, and BrahMos Corp has developed its guidance. Interestingly, the acronym BrahMos is perceived as the confluence of the two nations represented by two great rivers, the Brahmaputra of India and the Moskva of Russia.

The inimitably unique cooperation between New Delhi and Moscow managed to produce an outstanding universal weapon system in a remarkably short span of time. Advent of the BrahMos gave the Indian armed forces the much looked-for capability to undertake deep surgical strikes against the enemy. The high speed of the BrahMos gives it better target-penetration characteristics as compared to lighter subsonic cruise missiles such as the Tomahawk. Possession of such weapon systems in the Indian munitions store would successfully prevent any hostile ship close within 300 km at sea or on land when used in abundance with prior planning.

Although BrahMos primarily is an anti-ship missile, it is also capable of engaging land-based targets. Between late 2004 and early 2008, the missile has undergone several tests from a variety of platforms, including a land-based test from the Pokhran desert in western India, in which the S manoeuvre at Mach 2.8 was demonstrated for the Indian Army and a launch in which the land attack capability from the sea was also verified.

Typical Trajectories for Anti-Ship Applications of BrahMos



① - Launch
② - Turn into firing plane
③ - Acceleration, booster separation
④ - Cruising flight
⑤ - Diving
⑥ - Homing

This indeed could become possible owing to the long-term planning by the visionaries of both countries, nurtured by dynamic, resolute and result-oriented leadership based on basic fundamentals. These basic principles are inclusive of a strong desire towards excellence, exploring all potential possibilities and embracing aggressive expansion with quality control. The systematic and timely implementation of ideas laid a strong foundation to achieve the same while some limiting factors such as inertia of thoughts, misjudgement of potential and lack of ideas to put impetus into activities, needed to be changed through motivation, with the help of the government machinery.

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No wonder, success of the BrahMos is attributable to many known factors such as vision, government support, mutual trust between partners and sharing of the best available technologies, effective and dynamic management, passionate entrepreneurial spirit, and guiding principles that are inculcated into

the fabric of the organisation. Furthermore, the strength of the success of this joint venture could be summarised as:

- Creation and establishment of the brand name where the value of the brand is linked entirely to its quality and performance.
- Adopting out of the box solutions.
- Usage of extraordinary management skills by the apex leadership.
- Emphasis on product excellence.
- Strong leadership that can create projection of the vision at a national level.
- Demonstration of principles, which encourage a response with greater awareness of opportunity.

The emergence of the BrahMos as a top-notch weapon system in the world in its category includes research, development as well as establishment of machinery for production. BrahMos has often been compared with other weapon systems of the world in terms of cost. For such a complex weapon system, there are varieties of cost imponderables. Notwithstanding the same, when compared with other weapon systems of its class, BrahMos continues to remain the most cost-effective option, since cost-effectiveness is an outcome of the following factors:

- Technology used.
- R&D effort.
- Dividends in terms of accuracy, speed, reliability, shoot capability and ease at operation.
- Ease of maintenance and comparison of down time.
- Number of associated sub-systems required to operationalise the complete weapon system.
- Comparison of manpower required to operationalise the system vis-à-vis other systems.
- Least collateral damage, reducing fear of escalation of war beyond threshold level.
- Universality of missile as regards to the use from variety of platforms.
- Shelf life.
- Ability to form part of network-centric warfare.
- Capability to engage more than one target with salvo option from the same platform.
- Availability of spares back-up.

DRDO's devoted efforts towards enhancing self-reliance in defence systems, design and development leading to production of world class weapon systems and equipment in accordance with the expressed needs and the qualitative requirements laid down by the three Services surely needs to be acknowledged. The emergence of BrahMos has not only strengthened the country's technological base but has also elevated India's image worldwide since creation of mass production facilities has offered an opportunity to export a weapon system of this magnitude for the first time in the history of India.

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