



AKASH SURFACE TO AIR MISSILE (SAM) SYSTEM: A SUCCESS STORY IN THE MAKING

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The Integrated Guided Missile Development Program (IGMDP) was conceived by Dr APJ Abdul Kalam, the then Director of India's Defence Research and Development Laboratories (DRDL). It was proposed after setting up a multidisciplinary study team to develop missiles the need for which was likely by the defence services in the near future. The project obtained Government of India (GoI) sanction in July 1983. The IGMDP envisaged development of the Prithvi and Agni ballistic missiles, Trishul, short range surface to air missile (SAM), Akash, medium range SAM, and the Nag, a third generation anti tank guided missile (ATGM)ⁱ.

BACKGROUND

The IGMDP was intended to provide the country independence in technology that was likely to be essential for modern war fighting. Agni was initially conceived to be a technology demonstrator to develop and test re-entry technology. However later it followed the Prithvi missile into production in various different variants with different ranges. The Trishul missile development was not progressed beyond its initial development trials. The Nag ATGM development has continued with development trials and user evaluation progressing. The Akash SAM progressed well and after extensive and rigorous evaluation by IAF started to be inducted into the IAF to fill the medium range SAM requirement that had been filled by the Soviet era SA-3 so far. The Indian Army however, did not accept the Akash, saying that the missile system did not meet its required

performance parametersⁱⁱ. However, the Times of India reported on 23 Feb 2014 that the Indian Army (IA) may induct the Akash missile soonⁱⁱⁱ. This seems to imply that the IA has either found that the Akash SAM does now meet its performance requirements or that the latter have been reworked to factor in the performance available from the Akash SAM. Either way it is good news for India's indigenous arms industry. Induction of Akash into IA as well as IAF earlier will pave the way for the weapon system to mature and for further enhanced variants to be developed. Unit cost of the SAM system could also be expected to reduce as economies of scale come into play with larger orders. Most weapons manufacturing countries follow a base model with minimal capabilities followed by increasingly more capable variants following. For instance the Soviet fighters started with an initial model entering service such as the base model MiG-21F to be followed at intervals with increasingly more capable variants, the MiG-21F led to the MiG-21FL, MiG-21M, MiG-21MF, MiG-21Bis and now the MiG-21Bison. America follows a similar pattern. F-16s entered service as F-16A (Block-15) aircraft. In stages the basic F-16 has been improved progressively through regular Block modifications to the F-16C/D (Block-52) and Block-60/62, which are the most advanced F-16s in existence and are in UAE service. In a similar way it would be prudent for the Indian Armed Forces to accept indigenous equipment in base performance configurations and then give time to the developer to progressively upgrade the performance through addition of new capabilities and / or adding new capabilities to the base model equipment. Such a system if adopted would help the research and development organisations to follow realistic development goals and timeframes while also enabling them to build upon successes achieved to go to greater heights. IAF has accepted its first Tejas Light Combat Aircraft (LCA) in Initial Operational Clearance (IOC)-II configuration, while stipulating Final Operational Clearance (FOC) configuration for follow on orders. This has helped the production agency to commence production while working

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in parallel to add further capabilities in a phased manner. Indications are that further up gradation of the LCA's capabilities will follow a phased improvement system with the Tejas Mk-II on the cards^{iv}.

In a similar way the initial induction of Akash into both IAF and IA could pave the way for the basic system to stabilise in actual service conditions. While this is happening user desired changes and modifications could be collated and given to the manufacturer. At the same time a phased program to enhance the SAM's capabilities could be taken up. This would increase the utility as well as in service life of the weapon system. The Soviet era S-300 SAM system has progressed through its basic variant through the S-300PMU1 and S-300PMU2 and S-400 to the latest S-500 SAMs, the later variants of which series have very long range destruction capability as well as increasingly effective anti ballistic missile (ABM) and anti-satellite capabilities as well. On the American side the MIM-104 Patriot SAM system has followed a similar induction and enhancement path. Starting from the MIM-104A it is now in the MIM-104F variant. This latest variant is also called the Patriot Enhanced Capability (PAC)-3 variant. The Patriot's main mission has also changed progressively from anti-aircraft to anti-ballistic missile engagement.

The examples from the aircraft domain and other countries' missile programs highlight the fact that it is not prudent to demand very advanced performance from weapons manufactures who would be pushing their own capabilities and technology to the limit to achieve such high performance figures. It is more practical to set a lower base line performance level and then to progressively increase the performance requirements from a number of increasingly more capable variants in the following years. A spin off from such a process is likely to be greater self confidence of the scientists and engineers involved in the project. Such self confidence and belief in their own capabilities would provide great benefits in development of other or follow on weapon systems.

CONCLUSION

Reports to the effect that IA is considering induction of the Akash SAM system are good news for the nation's scientific community engaged on defence research and

development. Induction by IA and IAF should reduce unit costs as order numbers build up. A phased improvement plan for the weapon system has potential to enhance its lethality in later years as well to extend its useful in service life. A similar phased improvement plan from the lower capability base model initially inducted is the pattern followed by most advanced weapons systems manufacturers in the world.

(Disclaimer: The views and opinions expressed in this article are those of the author and do not necessarily reflect the position of the Centre for Air Power Studies CAPS)

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i "Integrated Guided Missile Development Programme (IGMDP)", <http://www.brahmos.com/content.php?id=10&sid=25>, accessed on 07 Mar 2014.

ii "Indian Army hedges its bets on Akash missile system", http://twocircles.net/2008jan14/indian_army_hedges_its_bets_akash_missile_system.html, accessed on 07 Mar 2014.

iii [Jatinder Kaur Tur](#), "Akash missile may be inducted into Army soon", <http://timesofindia.indiatimes.com/india/Akash-missile-may-be-inducted-into-Army-soon/articleshow/30878068.cms>, accessed on 07 Mar 2014.

iv "FOC and Fast Tracking Tejas MK-2 Development", <http://www.defencenews.in/defence-news-internal.aspx?id=yH2CYcpgKrM=>, accessed on 07 Mar 2014.