Introduction to Air and Ballistic Missile Defence Systems

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ABSTRACT

This paper introduces the air and ballistic missile defence in conjunction with the potential threat posed by modern operating theatres. This paper describes the defence architecture and describing systems as well as, components of technologies applicable to aircraft and missile defence equipment. Future armies must be prepared to operate in theatres where a wide range of aircraft and missile systems can be used in contrast.

Keywords: *Air Missile, Ballistic Missile, Defence Systems.*

1. INTRODUCTION

The military has gained considerable expertise in developing both air defence and ballistic missile defence systems. For many years, it has played an influential role in the development of air to air and ground to air missiles for air defence. Due to the nature of the multiple branches of these subjects, it was their military interests and power over the next year to integrate and relate related aspects of the problem.[2]

2. THREAT SYSTEM

The future military must be prepared to operate in theaters with a variety of aircraft and missile systems, it can be used against. Achieving a strong defence capability against this threat is both critical and challenging. In particular, the introduction of stealth capabilities, in contrast, will become a determining factor in adequate fielding of theater air and missile defence. Theater ballistic missiles range varies about 100 km to more than 2000 km. They can fly high, frustrated, or low power trajectories. They will eventually have penetration aids and some form of point to point accuracy. Cruise missile and UAVs can operate at high altitudes, from 25 meters to less than 25 KM speed per hundred meters per sec range. From stationary to tactical air to surface, missiles are fired from winged aircraft the inaugural aircraft eventually landed within reach of short-range defence near missiles on the ground. Permanent wings aircraft operate at low altitudes of up to 250km per 100m and speed some hundred meters per second. It may be used stealth technology, countermeasures. Helicopters operated at relatively low speed and low altitude range from 3-4 km above ground level. TBM is most challenging appears, of those threats, the reason for this very less transit time, very high terminal velocity, and very small target size. A TBM is to be carrying the various type of warhead, Machinegun, very high explosive, to bomb let configurations. TBM is an obedient weapon in the hands of aggressors. In addition to the range of the threat system, an integrated strategic air missile defence system, also presents a sequence of action. Larger networks are provided threat alerts, command and control barriers, and counter-attack directions.[2]

3. TECHNOLOGICAL DETAILS

A framework that combines functions of command, control, and communication with battle management must link space-based and ground-based sensors to the system element that controls engagements, commanding the fire units that launch and control the interceptors. A functionally analogous framework will be necessary to defend

against air breathers. Many of the systems that will be needed as elements in an integrated "system of systems" for air and missile defence could evolve as enhancements of systems already fielded. The most important requirement is for the Army to work with the other services to arrive at a common plan for the system's architecture. Among the system elements that will be needed are the following:

1. Area surveillance, warning, and tracking system to detect and, if not track, at least cue other systems to a TBM launch (a space-based system appears to be the most likely candidate for this mission);
2. A similar area system to locate and track hostile air-breathing aircraft and weapons and to assign interceptor systems;
3. An effective IFFN system to permit friendly use of contested air space;
4. Command, control, communication, and battle management capabilities to use interceptor assets for adequate defence of the battlefield or area to be protected; and
5. Adequate interceptor weapons and local systems for control of Interception.[2]

4. TECHNOLOGIES APPLICATIONS AND DEFENSE ELEMENTS

To achieve an integrated "system of systems," the following advanced technologies would be required:

1. High-speed microelectronics is essential to the sensors and high-speed processors.
2. Advanced composite materials are needed to construct heat tolerant, high-speed-flight vehicles that can meet the compressed timelines of future intercept systems.
3. Bistatic radars may be useful in detecting and tracking stealthy air vehicles.
4. Small electronics that can tolerate high acceleration are needed to permit guided projectiles to begun launched should this form of propulsion prove superior to guided rockets for point defence.
5. If guns prove to have advantages over rockets for point defence, pulsed power sources will be needed.
6. Multispectral sensors will be essential for extremely fast hit-to-kill interceptors. They may also be the foundation for advanced non-cooperative systems.[2]

5. CONCLUSION

Air and Ballistic Missile Defence Systems are complex and inevitably expensive if possible, may be able to reduce the costing for the future. Because the Army will operate most of these systems and can give some upgrades like multi-targeting devices at the same time with mass destruction and large scale area, it should be a principal architect of the systems it will operate and the means to coordinate them all in a larger system of air and missile defence systems. The Army cannot be an effective developer and operator of its share of hardware for this integrated system without participating in the creative analysis of the total problem and the definition of the architecture within which all individual systems must operate. Given the importance of success in this task to future Army operations, the Army must take the lead in what obviously must be an inter-service national effort.

6. ACKNOWLEDGMENT

The authors are very thankful to Prof. Dr.A.Gangele, Head of Mechanical Engineering Department, Sandip University, Nashik for their kind cooperation and support and special thanks to Mr.S.S.Kadam and Dr.K.P.Pawar sir for project guidance.

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