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INDO-ISRAEL COLLABORATION FOR INTEGRATED ANTI-MISSILE SYSTEM

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India and Israel will jointly build an Integrated Anti-Missile System (IAMS) to be deployed against nuclear and conventional missiles. The proposed missile defense program will see participation by Rafael and Israel Aircraft Industries (IAI) in partnership with Defence Research and Development Organisation (DRDO), state-owned Bharat Dynamics Limited (BDL) and Bharat Electronics Limited (BEL). The new program has been approved by the Indian Defence Ministry, with a contract expected to be signed in the next six months, according to a scientist with the DRDO at Defexpo India 2014[i]. Defense News reported the proposed system will integrate India's long-range Prithvi air defense missile system, with a mobile radar system being developed by BEL in partnership with IAI. Rafael executive in India said the company has offered to build India a dedicated command, control, communications, computers and intelligence (C^4I) system, to integrate with the planned missile defense system[ii].

DRDO under the aegis of Indian government in the year 1999 initiated development of its own Ballistic Missile Defence (BMD) system. India's BMD is a two-layered system supposed to tackle incoming missiles with exo-atmospheric interception using Prithvi Air Defence system (range of 80-120 km) and endo-atmospheric interception using Aakash missiles for Advanced Air Defence system (range of 15-30 Km). Prithvi Air Defence (PAD) system is devised for mid-course interception of attacking missile in its cruise phase and the Advanced Air Defence (AAD) is a terminal phase interception system which is designed to counter incoming missiles after their entry into the atmosphere. In their present

configuration, these systems are designed to counter missiles with range close to 2,000 km traveling at speeds ranging from Mach 3 to Mach 8[iii].

PAD and AAD were successfully tested in November 2006 and December 2007 respectively and with this, India became the fourth country possessing the capability of developing an Anti-ballistic missile system after United States, Russia and Israel[iv]. After a series of successful tests, then DRDO Chief, Dr V.K.Saraswat in an interview to PTI on May 06, 2012 confirmed the successful completion of phase-1 of ballistic missile defence shield with demonstrated capability of targets at 2000 Km. The phase-2 of the project aims to handle ballistic missiles with a range of 5000 Km and is expected to be completed by 2016[v].

Israel has advanced anti ballistic missile systems developed to counter threats from its neighborhood. Boeing and IAI co-produce the Arrow II interceptor and are developing the Arrow III interceptor for the Israel Ministry of Defense (MoD). The Arrow system uses the two-stage Arrow II interceptor to destroy an incoming target with a fragmentation warhead. Arrow III, also a two-stage interceptor, is designed to destroy an incoming target with an exo-atmospheric kill vehicle and provide additional defense capability for evolving threats[vi]. In addition Rafael Advanced Defence Systems has developed a truck-towed mobile air defence system called Iron Dome. The system has been developed with US funding to counter very short range rockets and artillery shell (155mm) threats with ranges of up to 70 Km. It can be operated in all weather conditions including fog, dust storm, low clouds and rain[vii]. Rafael is also developing another system known as David's Sling, which is designed to intercept medium-range missiles, as well as ballistic weapons that get past Arrow-III and Arrow-II[viii].

In the past, in addition to developing an anti-ballistic missile capability, India has expressed an interest in purchasing and perhaps producing a domestic variant of the Israeli Iron Dome anti-rocket system, according to the U.S.-based Defense News[ix]. This was confirmed in November 2012, when Indian newspapers reported the country's defense planners were considering the acquisition of an indigenous version of Iron Dome. Subsequent to this, it was in February 2013 when Rafael put its rocket-killing Iron Dome

system and the Stunner interceptor used in David's Sling, on display outside the Jewish state for the first time at the Aero India exhibition in Bangalore[x].

Coming to the question of efficacy and efficiency of IAM system, it has been experienced that there is no BMD system that can guarantee absolute protection against an incoming ballistic missile threat. A ballistic missile has three phases- the boost phase, the cruise phase and the terminal phase. A BMD system is complex in the sense that it is a system of systems, the main components of which will constitute an early warning sensor system to detect the rogue ballistic missiles boost phase, long range tracking radars to track the missile thereafter and an integrated system for initiating, tracking and guiding of interceptor missile to its target. The system will be integrated through layered network of real time data links feeding inputs to a Mission Control Centre (MCC) for command and control. The best time to intercept the missile is in its boost phase itself as it presents a sizeable radar cross section, but the limitation is the reaction time available. In the cruise phase, the ballistic missile would have shed its booster stages and would present challenges in tracking. In the terminal stages, the missile will be making a reentry into atmosphere and would present a large radar target due to heating effects. A BMD system generally will be designed to intercept the rogue missile using a minimum of two tier system and will fire a salvo of Anti Missiles (AM) at intervals to intercept it in exo-atmosphere as well as in endo-atmosphere.

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In this backdrop, it would be fundamental to scrutinize few issues prior to finalization of contract. IAMS system is yet to prove its success to shield a vast expanse of area and has been demonstrated to defend small states against much weaker adversaries. There is no guarantee that the system will ensure the estimated results. It is a well known fact that the Israel's Ministry of Defense has given Rafael the green signal to sell the ABM system to other countries a few years back[xi], but no contract has been secured by Rafael till date.

In case an IAMS is installed, will it be extended to safeguard Indian sub-continent or will be positioned for selected cities or regions. Are we aiming at having a widespread network of IAMS for each region? The response of IAMS against multi-pronged missile attacks also needs a pragmatic evaluation. As IAMS will come at exorbitant cost, its strategic advantage and deterrence capability will need a realistic assessment at an appropriate level.

IAMS will require a network of sensors. Will the sensors be ground based or will the system be integrated with sensors in air? If so, besides air borne sensors, are we factoring the satellite based sensors which will play the crucial role of early warning? If that is so, we should also plan for a constellation of military satellites to be integrated in this system. The call is for a long term perspective plan by the MoD taking on board the consensus of members from Strategic Forces Command, three service headquarters, Department of Space, DRDO, ISRO and participating Public Sector Units. As the Israeli systems have been developed with United States funding, we also need to ensure that USA will not put any restriction on transfer of technology. Collaboration for IAMS will definitely propel the ongoing BMD project of DRDO and reinforce existing ties with Israel, but the efficacy of the project will depend on the credibility and acceptability of comprehensive Indian vision planned for the next few decades.

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[i] http://www.defensenews.com/article/20140206/DEFREG03/302060025/India-Israel-Build-Anti-Missile-System accessed on 13 Feb 14

[ii] Israel to help India develop missile defense shield; http://www.defencenews.in/defence-news-internal.aspx?id=jEZBUB$$A050=

[iii] India's Missile Defense: Is the Game Worth the Candle? By Frank O' Donnell and Yogesh Joshi, August 02, 2013 accessed on 13 Feb 14 from http://thediplomat.com/2013/08/indias-missile-defense-is-the-game-worth-the-candle/?

[iv] Pooja Tyagi; "A look at the Indian Ballistic Missile Defence programme", accessed from http://www.indiatvnews.com/news/india/a-look-at-the-indian-ballistic-missile-defence-programme

[v] http://www.thehindu.com/news/national/article3390404.ece

[vi] http://www.boeing.com/boeing/defense-space/space/arrow/

[vii] http://www.army-technology.com/projects/irondomeairdefencemi/

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[xi] Israel to help India develop missile defense shield; http://www.defencenews.in/defence-news-internal.aspx?id=jEZBUB$$A050=