

Recent Developments in Missile Defense

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Introduction

The debut of missile defense came at the height of the Cold War and its impact on nuclear deterrence – hence on global stability – had been hotly debated at the time. Even today, two decades after the end of the Cold War, the very term “missile defense” means to many analysts nothing else than defending against nuclear ballistic missiles. In truth, missile threats and missile defense have long diverged from the nuclear equation. Once the exclusive domain of the superpowers, ballistic missiles with high explosive warheads are today almost as prevalent as tactical air power and often replace it as conventional strike weapons. Where air defense was once enough to secure a country's sky against hostile penetration, missile defense might now be required to do the job. Yet ballistic missiles still remain the choice platforms for nuclear delivery, and missile defense is still the only way to thwart them. This complicates the issue, entwining the nuclear and “conventional” balances. It is still the truth to say that missile defense is an adjunct to nuclear equations - but it is no longer the whole truth, as this paper will strive to demonstrate.

This paper tracks the rapid worldwide ascent of missile defense in the last few years as well as its context, whether nuclear or otherwise. Since missile defense is nothing but a response to missile proliferation, we shall first sketch the trends of missile threats around the world (save for the nuclear strategic missiles of

major nuclear powers). The paper will put a special emphasis on the case of missile defense in Israel as a prime example of a response to non-nuclear threats from radical and non-government entities. Further emphasis will be put on missile defense in the US as a prime example of response to emerging nuclear threats from radical states. The decades old saga of US homeland missile defense and its European adjunct will be treated in some detail. Finally, the paper draws some broad conclusions from the wealth of information, the main one being that the simplistic view of missile defense as an exclusive adjunct to nuclear balances needs a revision.

Missile proliferation

Missile Threats in East Asia

Both North Korea and China deploy sizable ballistic missile forces. China deploys both nuclear and non-nuclear missiles. Its nuclear missile force of IRBMs and ICBMs constitutes the main component of China's nuclear deterrence and plays little part in any in the regional missile threat scene. It is China's non-nuclear missile forces that are an issue of concern to the US and its allies. China is deploying a large number of tactical, non-nuclear missiles against Taiwan as part of its "Threat in being" policy of cajoling the Republic of China into unification with the People Republic of China. More recently, China has embarked on developing anti ship ballistic missiles. Such weapons, fired from thousands of kilometers away, could theoretically disable or even sink large aircraft carriers. Once perfected, they are bound to change the balance of sea power in the region.

North Korea deploys large number of non-nuclear short and medium range missiles, mainly as a threat against South Korea's military and civilian infrastructure, but also against Japan. At the same time, it is developing longer-range missiles that could threaten US bases in the Pacific Ocean and perhaps even regions in the continental United States. It is reasonable to assume that eventually such IRBMs and ICBMs will be armed with North Korean made nuclear warheads. It is also reasonable to assume that North Korean conventional missiles that can already reach Japan will also be eventually equipped with nuclear warheads, to provide North Korea with viable deterrence against both the US and Japan.

There is now a growing volume of reports on cooperation between North Korea and Myanmar that may include nuclear weapons and ballistic missiles. If true, this is bound to destabilize the entire South East Asia region (For illustration, North Korean supplied No Dong's fired from southern Myanmar could hit Singapore). It will also aggravate and complicate the already extant missile threats in South Asia.

Missile threats in South Asia

The South Asian scene is dominated by two sets of nuclear balances: first, the India–Pakistan nuclear equation, and second the India–China nuclear deterrence. Both India and Pakistan now deploy nuclear ballistic missiles of various ranges that can cover the entire homeland territories of each other. Some of their missiles however are non nuclear. As in the case of China, the role of the non-nuclear missiles forces is to strike the opponent's military infrastructure in conventional wars.

India, but not Pakistan, is developing nuclear, multi warhead IRBMs with sufficient range to reach the heartland of China. This effort is obviously aimed to create a stable balance of deterrence between the two nations.

The security of Pakistan's nuclear missiles has become an issue of concern in the West due to the prevailing internal strife between moderates and radicals. If the radicals manage to gain control of this arsenal, this could unhinge the stability of the entire international community. Pakistani government assurances that the nuclear arsenal is secure allay some of the fears.

Missile threats in the Middle East

The Middle East has the world's heaviest concentration of missiles and rockets. Virtually every Middle Eastern nation deploys ballistic missiles, while several non-government entities possess more rockets than the armed forces of Western nations. Missiles started proliferating into the Middle East in the 1960's and by the 1980's Syria already had Chemical Warfare (CW) missiles deployed against Israel.

The present buildup of immense arsenals is mainly aimed to compensate for the relative weakness of air forces. Iran, Syria, Lebanon and the Hamas regime in Gaza are the prominent wielders of missile and rocket power. Israel is the main target, but so too are the Gulf States and Saudi Arabia, vulnerable to Iranian ballistic missiles and heavy rockets.

The nuclearization of Iran, if and when it happens, might induce further nuclearization of other regional powers and introduce nuclear ballistic missiles into the region. The torturous politics and age-old animosities within the region will not facilitate stable nuclear deterrence policies. Moreover, over time, such nuclearization might pose a concrete threat to Europe and even the US.

Missile threats to Europe and the US

Currently, the EU is not threatened by ballistic missiles, save perhaps its northeastern members that may be targeted by the newly deployed Russian short-range missiles – a symbolic rather than concrete threat. Nevertheless, the growing sophistication and range of Iran's ballistic missiles is bound to give the Islamic Republic the capability of targeting most, if not all, of the EU countries in the not too far future, perhaps during the present decade. Many of the EU eastern European members are already within range of Iran's latest designs. Once equipped with nuclear warheads, Iran's missiles might pose a threat not seen since the height of the Cold War. Whether or not Iran will proceed to target Europe will be a question of intentions, but in any case the capabilities to do so will be available.

2. The spread of missile defense

East Asia

The increasing deployments of missiles, both nuclear and non-nuclear, are prompting numerous countries to embrace missile defenses as tactical response to non-nuclear missiles and as strategic response to nuclear ones. North Korea's missiles caused Japan to invest in a two-tier missile defense system: the upper tier is provided by AEGIS ships equipped with Standard Missile (SM) 3 Block 1 interceptors and the lower tier relies on terrestrial Patriot PAC 3 batteries deployed around the main cities. This array is scheduled to achieve initial operational capability by 2012. It will be augmented later on by a more potent interceptor missile, the SM 3 block IIA that is currently in joint US–Japan development. Once operational, Japan will have one of the first comprehensive homeland missile defense systems in the world.

South Korea's problem is more complicated, since its threat comes not only from ballistic missiles but also from large number of short-range rockets that can hit its capital city of Seoul from nearby North Korean territory. The Japanese missile shield architecture, optimized against medium range ballistic missiles, is therefore inadequate for South Korea. Nevertheless, its government is apparently close to decision of acquiring a suitable missile defense suite to protect its territory, although it is not yet clear which system or systems will be selected. Perhaps as a part of the preparation for such an eventual decision an early warning radar, suitable for tracking ballistic missiles, has recently been purchased from Israel.

Taiwan is facing a sizable threat of tactical non-nuclear ballistic missiles from the People's Republic of China (PRC). The large number and growing accuracy of PRC's missiles threaten to cause severe damage to Taiwan's military and civilian infrastructure in any prospective military confrontation, thereby significantly

eroding its power of resistance (a similar situation exists in the case of Israel, as we shall see further on). Taiwan's current Patriot PAC 2 air defense systems, although possessing some rudimentary capability to deal with tactical ballistic missiles, are clearly inadequate against this level of threat. President's Obama has recently confirmed the promise of his predecessor to supply the more modern Patriot PAC 3 systems to Taiwan, much to the protests of the PRC.

In the PRC itself there are indications that it is now advancing from tactical to strategic missile defense. The PRC is deploying acquired (or copied?) Russian S 300 air defense system that like the US Patriot system has dual capable against air and tactical missile threats. Dubbed HQ-9 by the Chinese, it was reputedly tested successfully against both air and missile threats. At the same time, China has been vociferous to date against strategic (i.e. nuclear) missile defense, upholding the ABM treaty at its time and declaring the policy of pure nuclear deterrence. Yet on January 11 2010, The PRC has laconically announced the success of a "midcourse" intercept of a ballistic target. The deliberate use of the term "midcourse" and the no less deliberate withholding of any further information about the test may indicate that it involved a new and more powerful system than nominal HQ-9 (which is designed for "terminal" phase interception hence incapable of "midcourse" interception). This in turn may signify a shift in China's tradition view on the relationship between nuclear deterrence and defense. If so, it is reasonable to assume that the motivation to this shift was the growing capability and range of India's nuclear ballistic missiles.

South Asia

India has adapted a policy of strategic and tactical missile defense to augment its nuclear deterrence vis-à-vis Pakistan and China and to cope with Pakistan's non-nuclear missile threat. It was rebuffed by the US when trying to acquire the US – Israeli developed Arrow missile defense system and had to make do with only its early warning cum fire control radar (similar to the type sold by Israel to South Korea) sold to it by Israel. Consequently India embarked on the development of its own two-tier missile defense system, based on two types of interceptors: the upper tier liquid propellant Pritvhi Air Defense (PAD) exoatmospheric interceptor and the lower tier Augmented Air Defense (AAD) endoatmospheric interceptor. It is reasonable to assume that the lower tier interceptor with appropriately tailored system will also serve as a single tier defense against the shorter-range non-nuclear missile threat from Pakistan.

Arabia

The growing Iranian arsenal of non-nuclear missiles and heavy rockets and its frequent display in dramatized exercises has prompted several Gulf States to acquire modern missile defense systems. The most prominent case is that of the UAE, which acquired the highly capable, exoatmospheric US developed Theater High Altitude Area Defense (THAAD) system – the first foreign customer for this

product. The THAAD performance is optimized for destroying medium range ballistic missiles like the Iranian Shahab 3 and Sejil. To cope with the shorter-range heavy rockets that can deploy against it across the Persian Gulf, the UAE is reputedly buying the US made Patriot PAC 3 system.

Kuwait has been deploying US made Patriot PAC 2 system since before the 2003 Iraqi war, and its missile defense forces participated in the successful thwarting of Saddam Hussein's brief missile campaign against US forces in the opening phase of that war. It is now reportedly buying the newer Patriot PAC 3 system. Qatar, who in the 1990's negotiated with Russia for the purchase of the S300 air/missile defense system (the deal fell through), is also reported to be buying Patriot PAC 3 systems from the US.

The case of Israel

While the prospective threat of Iranian nuclear missiles grabs the attention of most analysts, Israel's planners are currently even more concerned by the non-nuclear missile and rocket threats. Israel's antagonists have abandoned air power in favor of missiles and rockets, and in case of war can unleash a virtual firestorm on Israel's homeland territory. The thousands of rockets that hit Israel's north during the 2006 Lebanon War gave a foretaste of what large number of such simple weapons can do to an industrialized country. An added worry comes from the growing accuracy of the threats: with today's technology, both the Iranians and the Syrians have managed to upgrade their hitherto inaccurate heavy rockets into reasonably accurate weapons, such that can hit and paralyze military bases and civilian installations (beside causing heavy civilian casualties). By one estimation, Iran and its allies Syria, Lebanon and the Hamas regime in Gaza can now hit the highly industrialized hinterland of Israel with more than 1000 tons of high explosives. Like in Taiwan's case, non-nuclear missile and rocket are now capable of degrading Israel's power of resistance in a military conflict.

Israel purchased the US made Patriot PAC 2 air/missile defense system in the late 1980's to counter Saddam Hussein's growing missile threats. It first embarked on the development of its own anti missile system – the Arrow 2 - in the early 1990's mainly to counter Syria's CW missiles. The growing threat of both longer range missiles from Iran and shorter range rockets from Lebanon and Gaza prompted Israel to launch three more programs: the high exoatmospheric Arrow 3 to act as a forward tier against Iran's longer range threats, and two short range systems: "David Sling" against heavy rockets (and cruise missiles) and "Iron Dome" against the huge number of lighter, "Katyusha" type rockets. Together with the ongoing Arrow 2 upgrading Israel is currently engaged simultaneously in four missile defense programs, trailing only the US in the variety and scope of its missile defense efforts.

Europe

European political and military authorities regard missile defense in two separate contexts: first, as conventional defense of overseas deploying forces, and second as strategic defense against prospective Iranian nuclear missiles. The need for protecting overseas deploying forces against non-nuclear missiles and rockets led to several acquisition and development programs. France and Italy joined to develop the land mobile, short-range air/missile defense SAMP/T system with its enhanced naval interceptor missile. While that system is already in series production it has yet to be tested against ballistic targets.

In a parallel effort, Germany, Italy and the US are jointly developing the MEADS short-range air/missile defense system, based on the Patriot PAC 3 interceptor but with a brand new suite of radars and battle management centers. Once operational, the US plans to have MEADS replace all its Patriot systems.

The US made Patriot PAC 3 has been acquired by Germany, Greece and the Netherlands, while Spain, Netherlands and Denmark have purchased naval AEGIS systems that could eventually fire the Standard Missile 3 (SM3) interceptor. Turkey has invited bids for a nation wide air/missile defense array, and is being offered the Patriot PAC 3 by the US, the S 300 by Russia and the HQ 9 by China.

As for the strategic dimension of missile defense, Europe planners contemplate a continental (“territorial”) missile defense shield based largely on US missile defense assets position in Europe. A decision to that effect might be taken in the forthcoming meeting of NATO heads of state in Lisbon.

US missile defense initiatives

The US is the largest developer and user of missile defense systems today. For the protection of US forces abroad the US Army now fields the Patriot PAC 3 air/missile defense system and the heavier THAAD exoatmospheric system. In parallel, the US Navy is deploying the anti missile version of its shipboard AEGIS systems, based on the Standard Missile 3 (SM3) upgrade of the air defense oriented SM2. President Obama recently scrapped a futuristic high power laser system aboard a Boeing 747 jumbo jet but not before it scored some impressive successes in live interception tests. US tactical missile defense systems (Patriot PAC2) participated in the 1991 Gulf War with indifferent results and in the Iraq war of 2003 with impressive results.

The US has already engaged twice in developing homeland missile defense systems, once in the 1970’s (“Safeguard”) and once more in the 1980’s (“Star Wars”). Both episodes ended without showing tangible results. When President Clinton reluctantly signed the National Missile Defense act in 1999, he thereby launched the third episode of US strategic defense system, although in a much

toned down version relative to its two predecessors. Its implementation is dubbed the Ground Based Midcourse Defense System (GMDS), consisting of a sizable, three stage high exoatmospheric Ground Based Interceptor (GBI) and giant floating radar, the GBX. In 2002 President Bush revoked the ABM treaty and ordered the GMDS system to be deployed. It was planned to install 44 of those large interceptors in Vandenberg AFB, California, and in Fort Greeley, Alaska. However, the incoming Obama administration curtailed this plan in favor of a different approach to the US strategic missile defense issue.

US missile defense in Europe

The new approach to US strategic defense came in response to European criticism and Russian objections. For appreciating the circumstances that led to it, it would be useful to recall that Clinton's National Missile Defense act raised several objections by some European allies, one of which was that it will "uncouple" US security from that of Europe (similar objections were made against "Star Wars" in its time). President Bush responded by ordering the deployment of a GMDS battery in Europe to provide protection both to Europe and the East Coast of the US against future Iranian threats.

The plan was to position a radar in the Czech Republic and to deploy 10 two-stage versions of the GBI interceptor in Poland. Independent studies confirmed the Pentagon claims that this battery would offer protection against a limited missile attack to most of the NATO countries (save the southeastern nations closest to Iran) as well as to the East Coast of the US. The defensive value of this deployment was however severely limited by the very small number of deployed interceptors. Since the standard operating procedure of the US Army is to fire a ripple of two interceptors against each threat, the entire Bush planned deployment could engage at most only five hostile missiles.

Dubbed "The Third Site", the plan evoked sharp criticism in Europe and met with stiff resistance from Russia. Ostensibly Russia's objections were purely military, claiming that GBI interceptors from Poland could thwart Russian ICBMs on their way to the US, thus eroding Russia's nuclear deterrence. Nevertheless further motivations could be discerned in Russia's litany of objections including the resurfacing of the concept of spheres of influence. The Third Site became a bone of contention between the US and Russia and a source of deep concern for the "core" European nations regardless of its enthusiastic endorsement by Poland's and the Czech Republic's governments.

The incoming Obama administration undertook to "reset" US-Russian relations but at the same time confirmed US commitment to defend Europe against the prospective Iranian missile threat albeit with "proven" anti missile systems. Following a protracted period of reassessment, it froze the size of the two existing GMDS sites and scrapped the Third Site. Instead, it adapted the Phased Adaptive Approach (PAA) that aimed to provide the same level of defense to

Europe and the US but at a more measured pace. Like its predecessor, the new program involves the deployment of US missile defense assets in Europe, the main differences being the choice of weapons and the deployment timetable. Instead of the two stage version of the GBI, the PAA will rely on sea based and ground based naval AEGIS systems using advanced versions of the SM3 interceptors. Instead of a single step deployment scheduled for 2017, the new plan calls for phased, four steps deployment starting in 2011 and continuing till 2020, when full capability to protect the US from sites in Europe will be achieved.

The PAA is still patchy at points and has gaps that need to be filled. The more advanced versions of the SM3 missile on which the plan relies are not yet available. The interim version dubbed SM3 block 2A is in development but has yet to make its first flight. The ultimate SM3 block IIB version, vital for defending the US from European sites is virtually a new missile that does not exist as yet even on the drawing board. Nevertheless, and in spite of some overselling hypes (e.g. contrary to promotion it is *not* based on “proven” systems), the PAA was enthusiastically endorsed both in the US and in Europe. While the US administration has been adamant in denying any connection with the “reset” policy, it is hard to avoid a contrary impression. The PAA, based on the lightweight, relatively slow SM3 interceptor was envisaged as less challenging to Russia than the heavy, very fast GBI missiles of the defunct Bush plan. This appeasing feature was perhaps one of the reasons (but not the only one) for its warm reception in the US and “core” Europe. To compensate Poland, the US agreed to deploy a US operated Patriot PAC 3 battery in the intended location of the Third Site.

Russia’s reaction was different. The initially cool reception was soon replaced with open hostility. High-ranking Russian officials called it “worse than the previous (i.e. Third Site) plan”. Matters came to a head in the negotiation over the new Start treaty. Russian demands to impose limitation on US “strategic” missile defense in the treaty were forcefully rebuffed by the US; nevertheless, the preamble to the completed treaty document contains language that is seen by Russia (as well as in some US quarters) as limiting the US freedom of action in missile defense. In the preambles, both sides recognized the linkage between strategic offensive arms and strategic defensive arms and asserted that that the *current* defensive arms did not undermine strategic offensive arms.

Stripped of its diplomatic ambiguity, this language may mean is that that Russia is ready to live with the first and perhaps the second phases of the PAA but will resist the later phases with their extended deployment and upgraded performance. The jubilant reactions from some Russian sources to the conclusion of the new Start treaty document may indicate that this is precisely how they interpret it. In their view the language of the new Start treaty reinstates the ABM treaty in spirit if not as legally binding agreement. It therefore seems that the PAA is bound to hit some rocky patches ahead. The saga of US homeland missile defense as well as its European annex is far from over.

Summary and conclusions

The above survey indicates very clearly that missile defense is spreading in lockstep with missile proliferation, whether nuclear or otherwise. Wherever the missile threat is nuclear (such in the case of North Korea's threat on Japan), the responsive missile defense array is part of a nuclear balance. Yet where the missile threat is mainly non-nuclear (such in the case of Taiwan and Israel), missile defense is deployed regardless of the impact on any prospective nuclear confrontation. Simply put, countries buy into missile defense whether the missiles they are facing are nuclear or not. This tendency is even more conspicuous in the case of mixed nuclear and non-nuclear missile threats, such as in the case of South Korea and India.

The Cold War is seen today as a model of stability via pure deterrence. Defense was shunned by consent as enshrined in the ABM treaty. This had to do – at least in part - with the primitive technologies (by today's standards) available at the time. The US Safeguard of the 1970's required nuclear interceptors to ensure the destruction of incoming nuclear warhead. As a paradoxical result, the defense itself constituted a nuclear threat to the US homeland no less than the nuclear threat from incoming Soviet missiles. Today's technology enables interceptors with tiny conventional warheads or even with no warheads at all (relying on "hit to kill", body to body collision between interceptor and target) to destroy incoming ballistic missiles, as is being proven again and again in test ranges.

The advent of modern missile defense is offering two additional options for strategic planners: Defense without Deterrence, as selected by Japan and the United Arab Republic, and Defense with Deterrence, as opted for by India. The knee jerk reaction of many analysts to missile defense is "don't do it". This is an obsolete vestige of Cold War thinking. Analysts and policy makers would do well by accepting that missile defense is an inevitable fact of life. Rather than shunning it they should factor it into their calculus and exploit its advantages for security and stability.