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Policy Memorandum: How to Solve Sino-U.S. Missile Defense Dilemma?

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Disagreement between China and the United States regarding ballistic missile defense (BMD) systems has lasted for more than a decade. Up to now, we did not see any sign of solving this problem in near future. This memo will discuss how to solve this dilemma. Specifically, this article will discuss the technical and political impacts of U.S. BMD on China's nuclear deterrence, and work out hypothetical solutions.

Current U.S. BMD structure has the capability to engage Chinese strategic missiles. Because of China's proximity to North Korea, BMD systems designed to counter North Korean ICBMs naturally have the capability to engage Chinese intercontinental ballistic missiles (ICBMs) and submarine-launched ballistic missiles (SLBMs). The ground-based interceptors (GBIs) based in Alaska can engage Chinese missile at, roughly, the apogee. SM-3 IIAs in Obama Administration's phased adaptive approach (PAA) phase III also have the potential to counter Chinese strategic missiles. Combined with GBIs, the United States could in principle construct a multi-layered missile defense system against Chinese strategic missiles. Such a system would include SM-3s deployed near the Chinese coast; GBIs deployed in Alaska; and SM-3s deployed off the U.S. coast.

Obama Administration's Asia-Pacific BMD plan, declare in March 2012, will increase the threat on China. According to this plan, the United States will deploy two forward-based X-band radars (FBXs) in an undisclosed southern Japanese island and Southeast Asia (maybe Philippines) respectively, as a supplement to the FBX already positioned in Aomori Prefecture in northern Japan. Other radars in this area include the PAVE PAWS radar in Taiwan and the sea-based X-band radar (SBX) home-ported in Adak, Alaska. The three FBX radars in Japan and

Southeast Asia and the SBX could provide perfect tracking capability against China's SLBMs, from early boost phase to late midcourse. Taiwan PAVE PAWS can also track Chinese ICBMs and SLBMs through burnout and deployment of the reentry vehicle and decoys. This track capability is very important because it could contribute to midcourse discrimination between decoys an real warheads, the most challenge job of a missile defense system: if radar can see the deploying process of reentry vehicles and decoys, then the defense could easily distinguish the heavy-weighted real warheads from the light-weighted decoys.

Some plans released recently revealed the huge upgrade potential of U.S. BMD, which, if realized, will increase the threat on China further. As for interceptors, firstly, a congressionally mandated National Research Council (NRC) committee recommended replacing current GBI with two-stage Kinetic Energy Interceptor (KEI); secondly, U.S. Navy said in a memo to Missile Defense Agency in early October that it would like to accept SM-3 IIB interceptor with liquid propellant and a bigger diameter. Both two-stage KEI and liquid SM-3 IIB would be mobile and relocatable, and the burnout velocity of both interceptors would be higher than 6 km/s. As for radars, the NRC committee recommended introducing a new type of ground based X-band radar, doubling of existing FBX radars, one stacked on top of the other, and improving midcourse discrimination capability by the synergy between X-band radar data and concurrent interceptor observation while closing on the threat missile together with shoot-loot-shoot firing doctrine. From the perspective of strategic stability, the combination of fast and mobile interceptors, highly capable and high-resolution radars, and shoot-look-shoot firing doctrine would be a global nightmare.

To what extent U.S. BMD will undermine China's nuclear deterrence depends on China's criterion of nuclear deterrence. A reasonable explanation of China's nuclear posture is the concept of "first strike uncertainty," which means creating uncertainty "in the minds of the potential attacker's leaders about whether it is possible to destroy all of the victim's nuclear weapons before it can retaliate." So in order to deter nuclear attack and give oneself confidence, assured retaliation is not necessary, a degree of retaliatory possibility is enough. The threshold of first strike uncertainty for Chinese leaders can be concluded from China's nuclear experience. Before mid-1980s, Chinese leaders had never mentioned China's nuclear retaliatory capability. They appealed to people's war strategy and the endurance for long-standing warfare rather than nuclear retaliation to deter aggression. Only after mid-1980s, Chinese leaders began to talk about nuclear retaliation. A symbol of China's confidence is that in 1984, China's nuclear force (the Second Artillery) entered combat duty.

The presence of missile defense will reduce first strike uncertainty. At first glance, it seems that missile defense would eliminate first strike uncertainty completely, because a small missile defense could be able to intercept a very small number of Chinese nuclear warheads survived a U.S. first strike. But the reality is that it is very difficult for the defense to discriminate between real warhead and decoys, and it was reported that this problem has not yet been solved by current BMD system. This situation suggests that the difficulty of midcourse discrimination might be a source of uncertainty in the presence of missile defense, providing a window of opportunity for maintaining strategic stability without causing an arms race.

It is reasonable to conclude that at present, with a small-scale and less effective BMD, Sino-U.S. strategic relationship is stable. In the long future, if the United States builds a large-scale BMD with perfect effectiveness, Sino-U.S. strategic relationship would become unstable. We do not know when this perceptional shift will happen. It should be noted that first strike uncertainty is a psychological concept, so China might overestimate U.S. BMD's effectiveness, especially if the United States insists to develop and deploy BMD systems unilaterally and ignore other countries' concerns. Therefore from Chinese leaders' perspective, first strike uncertainty might be much lower than it will probably be, and China might be unconfident of its nuclear deterrence.

There are two kinds of solutions to this problem. Firstly, if the effectiveness of the defense is low, then the size of defense is not very important. Current GMD represents this scenario. A low effectiveness BMD can counter North Korean threats, without undermining Sino-U.S. strategic stability. This is the most favorable solution. A defense with low effectiveness means no extra X-band radars in Asia-Pacific area, no interceptors in Japan, and no shoot-look-shoot firing doctrine. As a return for U.S. constraints on BMD, China could show the United States that it has no interest for nuclear parity.

Secondly, if the effectiveness of the defense becomes high, then the size of the defense must be limited. The BMD structure recommended by the NRC report represents this scenario. In this structure, GBIs will be replaced by two-stage KEIs with a new kill vehicle; stacked FBX radars will be deployed in five sites; and shoot-look-shoot firing doctrine will be adopted. The United States will have reasonable confidence in midcourse discrimination. In this scenario, the size

limit on the defense depends on how effective the BMD is. If all planned forward-based radars are deployed, and the radars can see the decoy-deploying process of China's strategic missiles, which means the BMD has very high effectiveness, then the number of the interceptors should not exceed the number of China's survived strategic missiles. If all forward-based radars are cancelled or downgraded, then the interceptor number could be a little bit higher than that of China's survived strategic missiles.