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U.S. FORCES — THEATER MISSILE DEFENSE

by

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Background: A key area of controversy as the Presidential Commission considers the allocation of roles and missions of the services is the question of which service or services should be responsible for Theater Missile Defense (TMD). Prior to the Gulf War insufficient attention was given to this threat to our Armed Forces because Cold War threat analysts indicated that Warsaw Pact theater ballistic missiles were inaccurate and of little military significance. Improvements in ballistic missile accuracy supported modest improvements for the Army Patriot system, but the conventional wisdom of the 80's was that this threat did not present a real problem for air base or fleet assets. The Patriot system could be given some capability to counter Tactical Ballistic Missiles (TBMs) that were INF treaty compliant (less than 500 kilometers in range) and threatened critical military targets. While limited funds were allocated to counter these TBM threats, it never became a high priority, must fund, program.

The Gulf War changed forever that approach to TMD. There is no question that tactically and operationally speaking, the SCUDs fired at Israel and into Saudi Arabia had little or no effect on the outcome of that conflict. Whether the performance of the Patriot PAC-2, which was rushed to the theater to counter the threat, was outstanding or an adman's hype is not important. What is important is the fact that TBMs pose a significant psychological, if not real threat, to U.S. and coalition forces involved in future conflicts. Had the Iraqis used chemical or biological warheads on their missiles the effect would have been much greater on allied forces.

What is the situation today? Over a dozen countries possess TBMs. That number will double by the end of the century. Most of these nations possess the capability to use chemical or biological weapons and about half have, or may have, a nuclear capability in the near future. The success of U.S. cruise missiles during the Gulf War has also made them a weapon of choice in the arsenals of some probable adversaries. One needs only to attend arms exhibitions throughout the world to see ballistic

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and cruise missiles being offered to potential customers. Why would potential adversaries turn to these weapons rather than aircraft, ships or more tanks? There are a number of reasons, to include:

- A capability to intimidate or deter neighboring nations. The threat of their use against friendly populations increases the costs and risks that even a super power such as the U.S. must consider before initiating military action.
- A cheap way to restrict U.S. entry into a contingency area as the TBMs accuracy and range improve.
- A system cheaper and less vulnerable than manned aircraft to strike the rear areas of forces enjoying air superiority.
- Offensive weapons are available in the near term, while effective defensive systems are not readily available.

The recently published Joint Pub. 3-01.5, “Doctrine for Joint Theater Missile Defense”, defines the scope of joint theater missile defense as follows:

“Joint Theater Missile Defense (JTMD) seeks to counter the theater missile (TM) threat. Emphasis is placed on the growing missile threat from developing nations and the U.S. ability to protect its vital interests against this threat. JTMD for contingency, forward-deployed, and reinforcing forces and designated strategic assets located within a theater (e.g., civilian population, seats of government, industrial bases, sea and air facilities) is addressed. The focus is to protect against TM attack through an appropriate integrated and coordinated mix of mutually supporting measures.”

The U.S. military’s concept for defense against tactical missiles is based on four mutually supporting pillars:

1. **Passive Defense** — Actions taken to minimize the effects of a TM attack. Measures include, but are not limited to, reducing the enemy’s target acquisition capability by hiding, camouflaging, deceiving or otherwise confusing him. Vulnerability can be reduced by actions to minimize the effect of conventional, nuclear, chemical and biological weapons.
2. **Active Defense** — Measures taken to intercept and destroy in flight tactical missiles and, specifically, their warheads.
3. **Attack Operations (Counterforce)** — Actions taken to neutralize or destroy an adversary’s ability to produce, deploy and employ TMs.
4. **Command, Control, Communications, Computers and Intelligence (C4I)** — The system required to coordinate and integrate the joint force component’s capabilities to conduct passive defense, active defense and attack operations in an effective manner. This pillar encompasses the total solution from tasking the sensor, to finding the target, to controlling counterfire and active defense, to evaluating the battle damage on enemy systems.

The Joint Pub. 3-01.5 correctly points out that a TMD consists of an “integrated and coordinated mix of mutually supporting weapons”. It is absurd to believe that any single service has or should have the total TMD mission for all the possible contingency scenarios faced by U.S. armed forces today. It is as ludicrous as believing that airpower, seapower or landpower acting alone could have won the Gulf War. Only the carefully integrated and orchestrated use of all forces made that victory possible, quickly and with minimum casualties. The same will be true of a properly designed TMD system.

Management: Management of TMD programs within the Defense Department is unique among programs of its size and complexity. The management of all the research and development programs is centered in the Ballistic Missile Defense Organization (BMDO). The BMDO develops the overall TMD program plan and budget. Program development is coordinated with the military services who are the executing agents for different elements of the program. The BMDO is charged with responsibility for defending the program within DoD and before Congress. Military services execute research and development programs and are responsible for eventual fielding of the system in terms of force structure, training, doctrine development and operations, and maintenance costs. In spite of criticism of this approach by some, it does reduce to some extent redundant research and forces integration of service-unique or related systems. Another positive effect has been the isolation of TMD funds so that they cannot be diverted to other programs to which the services have assigned a higher priority for funding. This diversion of TMD funds has plagued similar programs in the past. Unfortunately for TMD, a single large line in the DoD budget is a lucrative target for budget cutters, both in DoD and the Congress, who do not understand the complexity of the program. It must be recognized that an effective TMD system involves different components in each service tied together into a flexible system which must be tailored to individual areas of operation.

Concept: A highly-effective system must consist of alternate attack means to assure a low leakage rate. A proper mix of sensors, weapons and C4I results in a layered defense which can counter the variety of threats that may be encountered in a contingency area. Those layers have been named the lower (to defend small areas) and upper tier (to defend cities and large forces). The lower tier/layer engages threat missiles which leak through the upper tier or have the capability to underfly upper tier systems. Some TBMs will be difficult for the lower tier to engage under any circumstance because of their approach velocity or angle of approach, therefore, even a layered defense is difficult to make totally leak-proof. The Air Force has contended that the most effective way of destroying an enemy TBM is during its boost or ascent phase. Attacks upon launch would occur early enough to allow later attack by lower or upper tier systems if required and would cause missile debris, particularly from mass-destruction weapons, to fall in enemy territory, if successful. This far-term concept is not without staggering problems. The threat missile must be detected, identified, tracked and destroyed within approximately 90 seconds from launch. This is not a trivial problem, and the research and development program for this approach will demand an exorbitant share of a DoD budget. Depending upon the boost or ascent phase interceptor platform used, it may be necessary to provide a significant self-defense capability as part of the operational concept.

Service Roles: Each of the services has a stake in TMD. The U.S. Marine Corps, recognizing the vulnerability of its force when committed to an incursion from the sea, is engaged in a short-term program for a limited defense against short-range TBMs and some cruise missiles. The program consists of modifications to the USMCAN/TPS-59 radar to give it the capability to detect and classify tactical ballistic missiles to ranges approaching 600 kilometers. This data is then passed to a Hawk fire unit through a modified command and control unit for engagement by a modified Hawk missile. The capability, while limited, does provide some point defense capability in the near term. Marine air provides a capability for attack operations if a launcher, missile storage site or command and control center can be pinpointed.

The Army, with its dominant role in land force operations, has a major stake in the proper integration and use of the four pillars of TMD. Few, if any, major contingencies will be brought to a successful conclusion without the use of landpower. In the defense phase and attack phase of a contingency operation, the Army component commander will be responsible not only for defeating the enemy, but with protecting his force. A key element in the protection of his force is an integrated TMD system. The Patriot PAC-2 system deployed to Israel and Saudi Arabia demonstrated a capability to engage Iraqi SCUDs and Al Husseins. Unfortunately, the system was not leak-proof as shown when an enemy missile struck a barracks. The Patriot PAC-2 capability will be upgraded to a much more capable PAC-3 system with hit-to-kill ERINT missiles. The Theater High Altitude Area Defense (THAAD) missile, currently in demonstrated evaluation phase, coupled with the Ground Based Radar (GBR) will provide U.S. forces with their first capability to engage longer-range threat missiles either endo— or exo— atmospheric, hit-to-kill conditions. The Corps Surface to Air Missile or CORP SAM system is currently in the concept definition phase of the acquisition process. This system will be designed to provide air and missile defense of Army maneuver forces and to protect fixed assets in division and corps areas. Its high mobility and versatility will be especially important during contingency operations. The Army's capability to perform deep fire operations utilizes primarily the Army Tactical Missile System (ATACMS) missile and attack helicopters, under some conditions. By utilizing the four pillars of TMD, passive, active, attack and C4I, the ground force commander will have the capability to employ a formidable TMD system when the developmental elements described are fielded.

The Air Force plays a key role in any contingency operation by establishing air superiority over the battle area. It possesses the capability of attack operations against enemy missile systems throughout the depth of battle. By integrating its organic sensors with National Systems it can often detect launches in sufficient time to give early warning to other systems and attack their launch site. However, attacking launch sites has proven extremely difficult against mobile platforms. The C4I capabilities of the Air Force when integrated with the ground forces' C4I capabilities should eventually provide a robust command and control system. Unfortunately that architecture does not exist today. The future of the far-term Boost Phase Intercept (BPI) concept is not clear today. Eventually, if operationally feasible and affordable it would provide a strong complementary system.

The Gulf War clearly showed the advantage of Navy assets when providing over-the-shore defense of critical friendly assets and attack of enemy assets. This is particularly true in the littoral areas of the world. The Navy's initial TMD program consists of improvement to the AEGIS and Standard Missile System to provide an offshore antimissile lower tier capability similar to the Patriot

PAC-3. The program consists of improvements to the AEGIS SPY-1 Radar and Weapons Control System Software to enable detection, tracking and engagement by the Standard Missile-2, Block IV. The Navy is continuing to study the feasibility of an upper tier capability, perhaps a marinized THAAD. Its land attack capability with sea-launched cruise missiles and/or manned aircraft is also a valuable counterforce asset.

Summary: If one examines the number of systems described above in isolation, it appears that many are redundant and should be scrapped. This would be foolhardy if the U.S. is to develop and field a complementary system or systems which is adaptable to a wide range of threats and physical environments. This threat varies from short-range, low-velocity ballistic missiles, to medium- to long-range ballistic missiles, to cruise missiles that fly at either high or low altitudes, to air-to-ground missiles launched by enemy aircraft. It would be advantageous if there were a single point solution to this problem; however, current technology does not provide that capability.

In the final analysis it will be the Joint Task Force commander or theater commander who will determine the proper mix and deployment of TMD systems most appropriate to the threat, the area of operations and the phase of the contingency operation. Each of the components, land, air and sea, will play lesser or greater roles in the contingency operations dependent on the three considerations indicated above. One thing is an absolute, there will be few very limited contingency missions that do not involve land forces, either Marines or Army. The commander of the land force components must have the capability of protecting his force and employing it in the most effective way to accomplish his mission. No one is better qualified to orchestrate the actions of the forces under his command than the individual who has spent his lifetime perfecting the expertise required of a land, air or sea forces commander. Hence, current and evolving systems should remain in the service most familiar with their use and dependent on their capabilities for the success of an assigned mission.

It is far most important to assure that the four pillars of TMD in and among each of the services are complementary. They should be employed by each service in accordance with their role and mission for a particular contingency theater. The services should work closely with BMDO to achieve this goal instead of arguing over who owns and mans a particular asset.

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