



Crafting a Strategy Leads to Right Decision

By Maj. Gen. Bill Chen, U.S. Army retired

Most major defense programs involving competitive technology development have a defined process that allows for selection of a winning contractor for the follow-on engineering and manufacturing development phase. But not all programs follow this structured acquisition process.

I faced a major challenge during my tenure as the Army's Program Executive Officer for Missile Defense in 1992 and 1993. The programs within the PEO office were the Army's national and theater missile defense programs. Within theater missile defense, Terminal High Altitude Area Defense was off to a good start. Lockheed Martin Corp. had just been awarded its engineering develop-

ment contract. Likewise, improvements for the Patriot missile and technology development on the Extended Range Interceptor (ERINT) air defense missile looked promising, with the programs fully funded for the engineering and manufacturing development phase.

Only One Could Be Chosen

The fully funded status for improvements to Patriot and ERINT was short-lived. Both were interceptor programs in technology development and could satisfy lower-tier missile interceptor roles. Because affordability became an issue, funding was cut to only allow one of these interceptor programs to enter development and production.

As it was, Patriot and ERINT were

on separate technology development paths. They were not part of a pre-designed competitive technology development program that led to selecting a winner for engineering development and manufacturing. Thus, my challenge was how to craft the "down-selection" strategy to select the missile interceptor for development and production.

The Patriot missile and ERINT also involved different technologies. The

Loral Corp., later acquired by Lockheed Martin Corp., was one of two major contractors involved in competition for the Army's lower-tier interceptor missile program. Its interceptor won and was designated the Patriot Advanced Capability (PAC)-3 missile, shown here.

LOCKHEED MARTIN CORP.

Patriot missile uses a proximity fuse with a blast fragmentation warhead. The guidance system directs the missile to an intercept point to then detonate the warhead. The ERINT interceptor used hit-to-kill technology—kinetic energy to hit the incoming target, like hitting a bullet with a bullet. Neither technology had been fully demonstrated.

Millions at Stake

Given that two major contractors were involved—Raytheon Co. for Patriot and Loral Corp., later acquired by Lockheed Martin, for ERINT—I wanted to ensure fair competition, be open with both contractors and have open communications with them. Millions of dollars were at stake because the contractor selected, if successful, would be the contractor for production of the missile. I wanted to develop the evaluation criteria for the down-select and orchestrate the decision process.

My overall strategy and plan involved first establishing the down-select criteria. The high cost of missile flight-testing would preclude reliance on flight-testing, as we could never afford enough missile tests to measure performance. Engineering data would be evaluated, but engineering data still is paper analysis. My conclusion was that the most important criteria must be hardware-in-the-loop simulations, where the simulations could run a full range of incoming ballistic missile scenarios and determine the missile interceptor responses.

Having just commanded the U.S. Army Missile Command at Redstone Arsenal, Ala., and being knowledgeable about their simulation center, I knew their capabilities on hardware-in-the-loop simulations must play a role in the down-select process. In sum, the criteria established were:

- Hardware-in-the-loop simulations.
- Flight-test results.
- Engineering data.

Next, I informed senior leadership at Raytheon and Loral about the down-select criteria via phone calls to the top contractor executives, and I had follow-on visits to the contractor facilities.

Top Evaluators

My most critical actions were to establish the government's evaluation process

with the establishment of a Missile Selection Board and a higher-level Missile Advisory Council. The board was a body to evaluate the results of the hardware-in-the-loop simulations, flight-test results, engineering data and contractor engineering development and manufacturing proposals. Results were reported to the council. The council reviewed the board's results and prepared a report to the Army Acquisition Executive and Defense Acquisition Executive.

I made a decision to appoint experts and stakeholders, specifically, users, force planners, program analysts, Army Staff, the Strategic Defense Initiative Organization and Office of the Secretary of Defense staff members to populate the board and council. This way, they were contributors to and participants in the process and could be counted on to get the support of their bosses.

I also informed congressional staffers of the process. With the two major defense contractors located in Massachusetts and Texas, I knew they had the support of their congressional delegations. My visits to congressional staffers reduced the queries they initiated.

Finally, my strategy and approach were to be persistent and not waver on the process. Until we completed the down-select process, we could not make a decision. We needed to maintain integrity of the process. During the process, after some missile flight-testing on one of the programs, I received phone calls from a senior government official asking why we could not make an earlier decision. I had to say no to the senior official, twice—firmly stating that we had not completed the process.

Time to Choose

The outcome of the down-select process was the ERINT interceptor won. It was designated the Patriot Advanced Capability (PAC)-3 missile.

Compared to a competitive technology development phase involving two or more competing contractors leading to a traditional source selection, the key difference in this Patriot vs. ERINT down-selection was the comprehensive hardware-in-the-loop simulations conducted using the hardware and software constituting the Patriot missile with its

proximity fuse system and ERINT with its kinetic energy kill mechanism. While in a traditional source selection contractors could submit in their proposals results of their own hardware-in-the-loop simulations in their contractor facilities, in the case of the Patriot vs. ERINT down-selection, all simulations were conducted by the government, ensuring a common environment and conditions for the evaluation of the competing interceptors in a full range of scenarios against threat ballistic missiles. In the history of the Army's missile defense development programs, no other evaluation of competing missile interceptors had used hardware-in-the-loop simulations to the extent done in this Patriot vs. ERINT down-selection.

Intellect Plus Instinct

In my case, I was a product of the Army Acquisition Corps and experienced in weapons systems acquisition. I had been a user, combat developer and project manager. I had Army Staff experience in acquisition management, and I had commanded the Missile Command. Faced with my challenge, my actions were to use my intellect and wisdom base and to trust my instincts for crafting the strategy and developing a vision and sense of direction with a clear set of goals. I ensured a transparent, fair process with open communications. I empowered the team I established (Missile Selection Board, Missile Advisory Council) and satisfied my stakeholders. Throughout the process, I maintained the integrity of the process and persistently stuck with the process until completion.

I believe the process and outcome resulted in the right decision for the Army, and the PAC-3 missile became the Army's first kinetic energy, hit-to-kill technology interceptor. The Terminal High Altitude Area Defense missile also uses hit-to-kill technology. ★

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