



Courtesy U.S. Armor Association

ARMOR MODERNIZATION

“Tank Trail to the Future...”

by Colonel David M. Cowan

Colonel Cowan is the TRADOC System Manager - Abrams, based at Ft. Knox. -Ed.

A mobile armored system that provides the speed, firepower, survivability, and shock effect to close with and destroy an enemy will be the centerpiece of combined arms ground combat on the 21st Century battlefield. The Tank Modernization Plan, published in the fall of '96, provides a road map for the Total Armor Force specifically tailored to the Force XXI battlefield. This plan reflects a year of intense efforts by many players from the entire Armor community to produce a strategy which meets the challenges of today and tomorrow. The Tank Mod Plan does indeed do that and is a “must read” for all tankers.

The purpose of this article is to introduce the mod plan to a wider audience. This is the first in a series of articles

which will detail the Modernization Plan for our armored force. In this first edition, we'll review the development of our modernization strategy.

The Armor Caucus

An assessment of the Armor modernization strategy in August 1995 by the Armor Center concluded that a holistic approach to Armor vehicle modernization was needed, that existing plans were unaffordable, and that the science and technology base for Armor was not aligned with 21st Century battlefield needs.

The realization of these shortcomings led to the Atlanta Caucus Initiative. On 22 November 1995, the Armor Center hosted a joint Combat Developer/Materiel Developer briefing at Headquarters FORSCOM for senior Armor leaders. The Caucus provided a forum to review and discuss the existing modernization plans, gain consensus on the problems, and decide upon a single strategy for Armor modernization.

Senior Armor leaders explicitly rejected evolving the Abrams into a Future Main Battle Tank (FMBT). They determined that only a revolutionary vehicle should merit significant modernization funding and that a new strategy for Armor modernization was necessary. Discussion yielded the following key points as a framework for developing the modernization plan:

- Accept prudent risk; continuous Abrams production/upgrades and FMBT fielding are not affordable
- Invest in a “Leap Ahead” FMBT for production in 2015-2020
- Mitigate risk by:
 - Completing M1A2 SEP (final production number beyond 1079 undetermined)
 - Developing improved 120mm munitions
 - Developing the XM 291 (120mm) gun
 - Installing select high-payoff improvements on the current fleet

- Develop and field a Future Scout/Cavalry System

On 15 January 1996, the Chief of Armor commissioned four Integrated Concept Teams (ICT) to flesh out Armor Caucus I guidance. The ICT core membership came from The TRADOC System Manager-Abrams Tanks (TSM-Abrams); the United States Army Armor Center Directorate of Force Development (DFD); the Program Executive Officer-Armored Systems Modernization (PEO-ASM); the Project Manager, Tank Main Armaments Systems (TMAS); the Tank Automotive and Armaments Command (TACOM); the Army Research Laboratory (ARL); and various research and development commands. The four ICTs focused on: the current Abrams fleet, gun and ammunition, a Future Main Battle Tank, and a Future Scout and Cavalry System.

Specifically, the ICTs had to develop modernization plans, based on Atlanta Caucus guidance, and influence the 98-03 Program Objectives Memorandum (POM). The ICTs used the methodology in TRADOC's new "Requirement Determination Pamphlet" to determine Force XXI conceptual implications, identify required operational capabilities, estimate the rough order of magnitude of costs and schedules, and formulate a program and a plan for modernization.

Multiple general officer reviews resulted in adjustments and culminated in successful briefings to the TRADOC and FORSCOM commanders and the Vice Chief of Staff of the Army.

The collective work of the Current Abrams Fleet, Gun and Ammunition, and Future Main Battle Tank ICTs is the foundation for the Tank Modernization Plan, and provided an immediate framework for the POM submission. This has resulted in an executable shift in tank modernization that complies with guidance from the Atlanta Caucus and is approved by the Army.

A second Armor Caucus was held during the June 1996 Armor Conference. Senior Armor leadership reviewed the key points of the previous caucus and were briefed on the current status of the Armor Modernization Plan. Caucus leadership determined that the M1A2 SEP tank with high payoff improvements may be called an "M1A3," but would not include a new turret or 140mm gun. Senior leaders

also directed a thorough review of the science and technology base to align programs to support the Tank Modernization Plan.

The Army Science Board Ad Hoc Tank Modernization Study

As the Caucus and ICT efforts unfolded, an Army Science Board Ad Hoc Tank Modernization Study also took place. The study analyzed armor modernization with the following objectives:

- Determine which technologies offer the most cost- and operationally-effective improvements for insertion into the Abrams tank beyond the current M1A2 upgrade program, and when the windows of opportunity will be present to insert these improvements.
- Determine when the Army will reach the technology and engineering "crossover" point(s) where it becomes more effective to develop a new tank rather than continue to insert advanced technologies into the Abrams tank, and what technology and engineering factors drive the choice between continued upgrades or the initiation of a new system.
- Determine, with respect to the "crossover" points, if a decision process, methodology, or model can be derived to address this issue for the tank and, if so, determine its potential for application to other ground combat systems.

After using a three-stage, decision-aid model to assess four possible tank modernization alternatives, the board arrived at the following conclusions:

- The Army does not yet visualize a change in the central role of the tank on the future battlefield. While recognizing the importance of UAVs, digitization, and helicopters, the need for a tank-like system remains a high priority well into the next century.
- Foreign advances in protection and gun/ammo combinations that are already in evidence indicate that by approximately 2015, the Abrams will be surpassed in its world #1 ranking by a new tank, perhaps Russian, if no new improvements

are added to the Abrams M1A2 SEP tank.

- A careful search of new technology failed to show a breakthrough for tank improvements before 2020. Several technologies could bring improvements to the Abrams family, but no such technology is on the horizon that would make it necessary and cost effective to opt for a new tank, or Future Main Battle System (FMBS), before 2015.
- The Abrams tank family, with prudent technology insertions as they mature and become available, should continue to be improved until an FMBS is warranted. The key areas for upgrading are survivability and lethality.
- Based on detailed battle analysis, the use of smart rounds for the tank (like STAFF or X-Rod), when coupled with improved target acquisition capabilities, shows a high leveraged payoff in range and lethality. An active protection system (APS), and the use of IR suppression and radar signature reduction techniques, if combined, would produce a significant improvement in the loss-exchange ratios by reducing U.S. tank losses.

The Army Science Board further proposed an implementation strategy that included continued M1A2 production (beyond Tank 1079), with a goal of completely fielding the active component (an additional 1967 M1A2 tanks). The Army Science Board proposal for continued M1A2 production did not include an examination of affordability.

Conclusion

With the results of the two studies on hand, senior leaders concluded that continuous M1A2 production/upgrades and investment in a Future Combat System were not affordable. They did feel, however, that prudent use of our resources will allow us to apply specific, high-payoff modifications to the Abrams fleet, mitigate risk with the development of a new gun and ammunition, and provide for leap-ahead capabilities that support development of a revolutionary Future Combat System. The "Way Ahead" for tank modernization is set. Subsequent articles will detail the modernization plan for the Abrams Fleet, Main Gun and Ammunition, and the Future Combat System.