

Soldier Armed

Compact Kinetic Energy Missile

By Scott R. Gourley

Considerable recent Army program development activity has focused on providing warfighters with an expanded array of battlefield lethality effects—expanding a commander's combat options by placing "more arrows in the tactical quiver."

One arrow that has long been explored but yet to be placed in that quiver is the kinetic energy missile. Its latest technological iteration is the compact kinetic energy missile (CKEM). As with its immediate predecessor, the line-of-sight anti-tank (LOSAT) CKEM holds the promise of providing tomorrow's light forces with a mix of enhanced lethality and survivability.

During a program update presented at the October 2005 AUSA Annual Meeting, Buster Thrasher, CKEM business development manager for Lockheed Martin, provided a look at where the Army stands on the possible fielding of a future kinetic energy battlefield missile. "Some of you were familiar with the LOSAT program that was almost going to be fielded with the military," Thrasher began. "But because of cost constraints, the LOSAT program was closed out last year."

Under LOSAT program plans, the Army had projected fielding one Humvee-based LOSAT battalion (36 launchers) to each of the Army's five light infantry divisions. A total of 174 launch platforms would have been provided with approximately 1,500 missiles.

That design, now terminated, was just the latest attempt to integrate and field a kinetic energy weapon on the

battlefield. Previous configurations had included late Cold War designs to place a LOSAT missile on a Bradley chassis, post-Operation Desert Storm designs placed on an M8 armored gun system and the 1998 development program to place LOSAT on a Humvee.

That LOSAT missile design had weighed 174 pounds and measured nine feet in length. Through significant engineering work, the CKEM design has managed to repackage the same capability into less than 100 pounds and five feet in length.

The CKEM features a RF uplink for

existing and future communications and a dual-pulse, new propellant formula, minimum smoke solid rocket motor that delivers the "novel" kinetic lethality to ranges of 5 to 8 kilometers.

Thrasher noted, "Some have asked, 'Are you going to be shooting targets at 8 kilometers?' Well, that's pretty much constrained by whatever platform it goes on. If your optics or fire control can't see, then certainly you're not going to try to engage at that range."

At the ranges that are possible, the CKEM is capable of delivering devas-



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An outgrowth of the line-of-sight anti-tank program, the compact kinetic energy missile (CKEM) will measure approximately 5 feet in length, weigh less than 100 pounds and travel at speeds of approximately one mile per second.

Developers are looking at options for integrating CKEM on platforms like the unmanned Future Combat System multifunction utility/logistics equipment vehicle shown here.



Lockheed Martin

tating destructive effects at sea level speeds of approximately Mach 6.

"To put this in perspective, the 120 mm tank round has about 8 megajoules of energy, a megajoule being a unit of measurement of energy," Thrasher said. "The CKEM delivers in excess of 35 megajoules of energy, so when it hits a target it's definitely going to defeat it."

He emphasized that the size reduction of the current design has reached a plateau based on the Army's lethality requirements. "With the physics the way they are, if you go down to 55 or 60 pounds [for your missile], you're not going to have the megajoules of energy that you'd like to have," he said.

Thrasher noted CKEM's ability to defeat the toughest and most sophisticated targets on the battlefield, including current and projected active protection systems (APS). "Right now some of those [APS] systems, like those we have in development in the Army, can defeat a lot of chemical energy missiles," he added, "but there's simply no reaction time for an APS to defeat the CKEM missile. There's no target type out there that it can't be used for," he continued. "I'll admit that CKEM may not be your weapon of choice for an engagement in a MOUT [military operations in urbanized terrain] environment, but you can use it if you need to." The opti-

mum battlefield solution described by Thrasher would involve a battlefield mix of both chemical energy and kinetic energy missiles.

Thrasher pointed to the fact that LOSAT spiral development processes provided a strong foundation for the CKEM program. "The biggest impact [of LOSAT termination] was that our platform went away," he said, "because we had developed the [kinetic energy] fire control system with Raytheon and done the integration onto the Humvee." In the near term, CKEM efforts are being directed toward the Humvee platform, with the Army providing several of the former LOSAT chassis for initial CKEM integration.

That integration work is being conducted under a 36 month ATD [advanced technology demonstrator] program for the Aviation Missile Research Development and Engineering Center. "The current ATD expires in September 2006," Thrasher noted, adding, "We've got eight missiles that we'll be firing all next year at different targets."

Emphasizing that follow-on program plans were still unofficial, he indicated that the CKEM team was working with the user community to explore the possibilities of extending the 36 month ATD an additional 18 months to allow the program to feed directly into fiscal year 2008 funding. "Then we could work some 2008 POM [Program Objective Memorandum]

money to make CKEM a SDD [System Development and Demonstration] program," he said.

Along with the current Humvee configuration, Thrasher said that CKEM could also be migrated to Stryker or Bradley platforms. "The quickest path is to put it on the Humvee, which we've already proven," he said. "But [the platform] is an Army decision. Again, we're also looking at putting CKEM on Strykers and possibly, down the road, using CKEM to replace the TOW missile on the Stryker ATGM variant. As you know there are 50 some Stryker ATGMs fielded to the Army today and this would make a good match to give those Strykers increased lethality." One rough artist concept showed a Stryker with a pop-up turret equipped with four CKEM missiles. "You could also put it on the Bradley to replace the Bradley TOW system," he said, adding that this is all conceptual work being performed by Lockheed Martin while awaiting further Army guidance and decisions.

The company has also started rough examination of some armed robotic applications, including placing CKEM on the unmanned Future Combat Systems MULE [multifunction utility/logistics equipment vehicle] platform.

"It keeps our soldiers out of harm's way," Thrasher concluded. "It gives them greater destructive capabilities; therefore, they will be more lethal on the battlefield." ★