

Cluster munitions: the US aims for safer submunitions with the same effects

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The United States has put its cluster munition ban on hold, but is still working to replace its submunition weapons with ones that do not leave behind unexploded ordnance. *Daniel Wasserbly reports*

The US Department of Defense (DoD) in late 2017 reversed a Bush-administration policy that was to rid the US armed forces of cluster munitions by 2019. Instead, the Pentagon plans to keep cluster munitions in its arsenal until the munitions can be more effectively replaced with similar area-effects weapons – and new means of achieving those effects are beginning to emerge.

The 2008 Convention on Cluster Munitions (CCM) was ratified and came into force in August 2010, with states joining the convention committing to destroy their cluster munitions stocks within 10 years. Also in 2008, a directive by then-Secretary of Defense Robert Gates declared the US armed forces, led by the US Army, would replace cluster munitions with more reliable warheads. Gates' policy was strict enough to essentially rule out the explosive submunitions that underpin cluster weapons. It said the Pentagon could “only employ cluster munitions containing submunitions that, after arming, do not result in more than 1% unexploded ordnance [UXO]”.



A US Army M109A6 Paladin howitzer conducts a fire mission at Qayyarah West Airfield in Iraq as coalition forces move towards Mosul. The army's C-DAEM and other projects hope to add a 155 mm 'area effects' weapon that does not leave behind UXO. (US Army)

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Some notable military powers have not joined the CCM, including China, North Korea, Russia, South Korea, and the United States. So although the Pentagon in 2008 principally banned cluster

munitions, fears of Russian, North Korean, or Chinese armour and artillery – and a possible return to ‘great power competition’ more generally – have led US military officials to reconsider Gates’ policy.

Alternative warhead

To maintain strike capabilities without cluster munitions, the US Army is still in the process of replacing the submunition variant of the 227 mm Guided Multiple Launch Rocket System (GMLRS) – a precision fires weapon that was especially popular among artillerymen in Iraq and Afghanistan for its range and accuracy. GMLRS’ Dual-Purpose Improved Conventional Munitions (DPICM) model is being replaced with the M30A1 GMLRS Alternative Warhead (AW).

The first GMLRS AW rocket was built at Lockheed Martin’s Camden, Arkansas, facility in 2016. An initial production contract for it was awarded in June 2015. “Each GMLRS AW rocket will be packaged in an MLRS launch pod and will be fired from the Lockheed Martin [High Mobility Artillery Rocket System] HIMARS or M270 family of launchers,” the company said. GMLRS can be fired from the tracked M270A1 Multiple Launch Rocket System and the wheeled M142 HIMARS.

GMLRS AW and GMLRS Unitary share 90% common parts, Becky Withrow, director of business development for Lockheed Martin Missiles and Fire Control, told *Jane’s*. The technology uses the same spinning tail section, booster motor, guidance package, control augmentation system, and fusing as the GMLRS Unitary variant, but changes the warhead's payload to Orbital ATK’s Lethality Enhanced Ordnance (LEO) technology.

The new warhead's design uses a PBXN-110 explosive fill (the Unitary variant uses PBXN-109) and, instead of a fragmenting charge, about 180,000 tungsten spheres are layered around an explosive charge. Those penetrators provide the area effect, but are inert so will not result in unexploded ordnance. This solution was likely necessary because Gates’ former cluster munitions policy required no more than 1% UXO, and explosive submunitions technology had not been reliable enough to meet that.

The policy may now be on hold, but the GMLRS AW is in full-rate production and the first delivery to the US Army was in July 2016.

“We are working on a GMLRS extended-range programme, and that will eventually extend the range out to 150 km,” Withrow said. “A GMLRS extended-range weapon could use either the AW or the Unitary warhead,” she added. The extended-range GMLRS is now in development and the army hopes to have it in the field by about 2021.

For their part, the army and US Marine Corps (USMC) have at times argued that safer solutions such as GMLRS AW, meant to replace cluster munitions but replicate their effects, have not come along quickly enough – hence the DoD’s suspension of the ban.

Lieutenant General John Murray, US Army deputy chief of staff for resourcing (G-8), told Congress in May 2017 that not using cluster munitions would ‘absolutely’ mean an unacceptable capability gap for land component area effects when fighting against a near-peer adversary.

At the same hearing, USMC Lieutenant General Gary Thomas, deputy commandant for programmes and resources, said he would “advocate a change”. He added, “The DPICM capability is very important to our force and to replace that capability is going to take a lot more time and a lot more money.” Lt Gen Thomas said the USMC was still proceeding to buy GMLRS AWs but would

not receive its full requirement until the mid-2020s. Such arguments, and growing concern about possible high-end conflicts in which striking area targets might be important, augured the 2008 cluster munition policy's suspension.

ATACMS

For longer-range systems, the army is still converting its M39/M39A1 Army Tactical Missile System (ATACMS) with anti-personnel and anti-materiel (APAM) bomblets into the M57E1 ATACMS Unitary via a service-life extension programme (SLEP) that Lockheed Martin is also leading. This new ATACMS Unitary will use a 500 lb WDU-18/B warhead from the US Navy's Harpoon missile.

The army and Lockheed Martin will re-grain the M39/M39A1 motor, update obsolete navigation and guidance software and hardware, and replace the M39/M39A1 APAM bomblets with the WDU-18/B warhead. This will essentially reset the ATACMS service life, extending it for another 10 years, Misty Holmes, business development manager for Lockheed Martin Missiles and Fire Control, told *Jane's*.

The M57E1 missile uses inertial measurement unit (IMU) and GPS guidance to travel out to 300 km, and, like GMLRS, it can be fired from the tracked M270A1 or wheeled M142 rocket launchers.

To create area effects without submunitions, an M57E1 ATACMS Unitary could also be fitted with a proximity sensor to add an airburst mode. "We've actually completed the testing, and qualified it, and so we're hoping it will be part of the SLEP II contract, and that contract should be issued this summer [mid-2018]," Withrow said.

The Pentagon's annual Director of Operational Test and Evaluation report for 2017 said ATACMS has performed well in testing, and "five of five ATACMS with proximity sensors reliably detonated [during testing in 2017]". The report added that the proximity sensor "consistently detonated within the required height of burst range and within the accuracy requirement".

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