

Guided Multiple Launch Rocket System (GMLRS) – Unitary

Executive Summary

- U.S. and allied forces have fired over 930 Guided Multiple Launch Rocket System-Unitary (GMLRS-Unitary) rockets in support of current combat operations.
- The Army completed the GMLRS-Unitary IOT&E in April 2008.
- DOT&E completed a Beyond Low-Rate Initial Production (BLRIP) and LFT&E report in support of the Army's planned December 2008 full-rate production decision. GMLRS-Unitary is operationally effective, lethal, and operationally suitable.
- Operational testing demonstrated unit leaders can use the command and control software to effectively employ GMLRS-Unitary.

System

- The GMLRS-Unitary warhead rocket has a single 196-pound high explosive warhead and a range of 70 km. The rocket uses Inertial Measurement Unit guidance and the GPS to attack targets with a required accuracy of less than 15 meters from the desired aim point.
- The procurement objective for GMLRS-Unitary is 34,848 rockets. The Army plans to enter full-rate production in December 2008.
- The M270A1 Multiple-Launch Rocket System and the High Mobility Artillery Rocket System (HIMARS) are capable of firing GMLRS-Unitary rockets.
- GMLRS-Unitary will have three fuze settings in order to attack different target types at extended ranges:
 - Proximity fuze for use against personnel in the open
 - Delay fuze for lightly fortified bunkers and structures
 - Point detonating fuze for single, lightly armored targets



- GMLRS-Unitary rockets provide a day and night engagement capability in all terrain and weather conditions.

Mission

Commanders will use GMLRS-Unitary rockets to attack point targets in restricted terrain that may require reduced collateral effects beyond cannon artillery ranges.

Prime Contractor

- Lockheed Martin

Activity

- Coalition forces have fired over 930 GMLRS-Unitary rockets in support of current combat operations. The rockets are achieving commander's desired effects based on data provided to DOT&E by the Army.
- The Army completed the IOT&E at White Sands Missile Range, New Mexico, in April 2008.
- DOT&E completed a BLRIP and LFT&E report in support of the Army's planned December 2008 full-rate production decision.

Assessment

- GMLRS-Unitary is operationally effective, lethal, and suitable. GMLRS-Unitary achieved effects on 11 of 12 missions with a median miss distance of 4 meters for all missions during the IOT&E flight phase.
- Operational testing demonstrated unit leaders can use the command and control software to effectively employ GMLRS-Unitary.
- The GMLRS-Unitary with the point detonating fuze meets collateral damage requirements as demonstrated through

modeling and confirmed with developmental and live firing test data.

- The rocket demonstrated the 92 percent reliability requirement in developmental and operational testing. The principal failure mode is lack of warhead detonation in the delay fuze setting.
- Developmental and operational testing confirmed that with accurate target location, GMLRS-Unitary can meet its effectiveness requirements against countermeasured targets. The Army has confirmed deployed units in combat can locate stationary targets with the needed accuracy.
- During the IOT&E, one rocket detonated over 750 meters from its intended aimpoint. The warhead should not detonate at this large miss distance. As designed, the rocket will not arm if its navigation sensors report it is more than 250 meters from the desired flight path 1.5 to 3 seconds prior to impact. The Army conducted a thorough analysis and could not determine a definitive root cause of the anomaly. They did conclude the missile test was within the GMLRS operational envelope and there were no system design deficiencies, assembly discrepancies, or failure trends.
- The Army Aviation and Missile Research Development and Engineering Center and the contractor focused their analysis of the 750-meter miss on the accelerometer within the rocket guidance system. The program manager and contractor have identified software and assembly process enhancements related to the accelerometer and will phase them into the production process. The Army is issuing a Medium Risk Safety of Use Message due to this anomaly.
- During the second IOT&E flight test, two rockets missed the target by 35 to 100 meters due to a software-human interface problem. During the fire mission, the launcher software gave the crew a poorly worded advisory that the rockets did not have GPS capability. The crew proceeded with the fire mission and the rockets flew without GPS and missed the target. The Army is updating the launcher software so that the crew receives a more pronounced warning on their fire control panel.
- Rockets have been restrained in the pod after receiving the command to fire during developmental testing and in a few

reported cases in theater. In these rare events, the rocket motor continues to burn inside the rocket pod and does not leave the launcher. These restrained fires have not caused Soldier injuries. The rockets that experienced restrained fires came mostly from one production lot and the Army has removed that lot from theater. The contractor has redesigned the rocket restraining mechanism and will field the redesigned pods after the full-rate production decision and completion of additional flight testing.

- The rocket motor and the warhead are not insensitive munition compliant. The GMLRS-Unitary warhead is the least vulnerable to enemy fire within the family of MLRS munitions. DOT&E recommended that the Army continue pursuing improvements to the insensitive munition rating, which the Army is currently investigating.
- The Army conducted additional GPS jamming in developmental tests and the IOT&E, as requested by DOT&E. The rocket was able to defeat all of the GPS-jammed targets in the IOT&E using GPS jamming tactics, techniques, and procedures.

Recommendations

- Status of Previous Recommendations. The Army is addressing all previous DOT&E recommendations.
- FY08 Recommendations. The Army should:
 1. Continue pursuing methods to improve insensitive munition ratings.
 2. Fully characterize the root cause of the 750-meter radial miss error seen in the IOT&E. Develop, verify, and test the fixes to preclude recurrence.
 3. Continue the planned software modifications to prevent crews from unknowingly firing GMLRS-Unitary rockets that cannot acquire GPS.
 4. Complete planned tests of the redesigned restraining mechanism.
 5. Include GMLRS-Unitary effects against buildings in the Army's targeting tool. It does not currently include GMLRS-Unitary effects, so Soldiers in the IOT&E had to use a surrogate weapon system.