

20 mm PGU-28/B Replacement Combat Round

Executive Summary

- The Air Force conducted LFT&E of the Penetrator with Enhanced Lateral Efficiency (PELE) in accordance with a DOT&E-approved test plan.
- The PELE exhibited lethality against all targets engaged during qualification and Live Fire testing.
- The PELE exhibited the capability to produce damage off the main axis of penetration as a result of the lateral fragmentation produced upon target impact.

System

- The Air Force initiated the PGU-28/B replacement program following significant safety issues with the PGU-28/B that resulted in its removal from use. The Air Force sought to restore a combat capability through non-developmental means and chose the PELE 20 mm projectile as the candidate system.
- Alliant-Tek Systems (ATK) and Diehl Munitionssysteme of Germany, in a cooperative effort, developed the 20 mm PGU-28/B replacement cartridge by integrating the PELE projectile with an ATK 20 mm cartridge case.
- The PELE does not use explosives or a fuzing mechanism. Rather, it is a kinetic energy projectile that converts forward momentum into lateral fragmentation and penetration.
- The projectile case is steel, whereas the inner core is plastic. Target impact causes the plastic filler to expand in diameter with very high pressure. The rapid expansion of the plastic filler ruptures the steel case, achieving fragmentation with lateral velocities of about 300 meters per second.



- The PELE cartridge is intended to be compatible with F-15, F-16, and F-22 aircraft.

Mission

Fighter aircraft pilots will use the PELE cartridge to produce mission kills against enemy fighter and light civilian aircraft, produce mobility kills against light utility vehicles, and to inflict personnel casualties.

Activity

- In 1996, the Air Force's 46th Test Wing of the Air Armament Center conducted side-by-side ballistic testing of four candidate replacement rounds for the PGU-28/B semi-armor-piercing high explosive incendiary projectile. Based upon those results, the Air Force selected the PELE as the most suitable candidate and proceeded toward completing developmental and operational testing, and ultimate fielding of the replacement projectile.
- During the 3/4QFY07, the 46th Test Wing conducted qualification and Live Fire testing of the PELE.
- The Air Force conducted test shots from a fixed gun mount against personnel targets (plywood mannequins) and against materiel targets (trucks with diesel and gasoline stowed, armored personnel carriers, and a Cessna aircraft).
- The Air Force also conducted F-16 air combat missions from various altitudes, attack azimuths, and attack elevations against personnel targets (plywood mannequins) and against materiel targets (trucks, armored personnel carriers, and a parked F-16 aircraft).

- The Air Force has completed LFT&E and OT&E (Force Development Evaluation). The Air Force 53rd Wing is preparing a fielding recommendation based upon test results and will present that recommendation to the Air Combat Command (ACC) during 2QFY08. Future procurements of the PELE will be based upon ACC's fielding decision.

Assessment

- The PELE exhibited significant lethality against personnel targets.
- The PELE exhibited significant lethality against the truck targets and the Cessna target. The main penetrator exhibited potential to penetrate not only the thin skin of the targets, but also the engine blocks. The penetrator exhibited adequate fragmentation (breakup) to achieve lethality effects off the main axis of penetration. The penetrator also exhibited potential to initiate fires when impacting stowed gasoline.

AIR FORCE PROGRAMS

- The PELE perforated the armor on the armored personnel carrier with sufficient energy to cause internal damage to components and personnel.
- The PELE exhibited lethality along and adjacent to the main axis of penetration against the F-16 aircraft. Fragmentation caused significant damage to electrical, control, and hydraulic lines.

Recommendations

- Status of Previous Recommendations. This is the first annual report for this program. There are no previous recommendations.
- FY07 Recommendations. None.