



mishap

LESSONS LEARNED

MISHAP SUMMARY

Mishap
M825 WP Artiller Life Fire

Damage
\$2,713.51

Injury
None

Operation
Artillery

DISCLAIMER

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Artillery Live Fire Mishap

BACKGROUND

An artillery battery was conducting a M777A2 155MM howitzer live fire exercise and fired several M825 White Phosphorous (WP) rounds into the impact area. A privately owned vehicle driven by a civilian employee was struck by a M825



canister as the civilian employee was driving home. It is currently unknown what specifically caused the round to travel outside of the impact area. Base ejecting projectiles can exceed their intended target locations by up to 1,000 meters, which may be caused by an air foil effect or an early functioning fuse. The M825 canister struck the vehicle underneath the front bumper and exited near the left front wheel well, causing vehicle damage, but no injury to the civilian employee. The Provost Marshals Office (PMO) and Explosive Ordnance Disposal (EOD) responded to the scene while range control placed all artillery firing units into a check firing status. During a search of the area, EOD discovered a second M825 canister approximately 200 meters east from the first canister. In both instances, the canisters were clear of any explosive hazard with the fuse wells empty.

DISCUSSION

- The canister lost all ballistic characteristics once its felt wedge payload was expended.
- Inadequate stand-off distance between the impact area and high traffic areas. Several important roads run extremely close to the impact area, and this provides insufficient stand-off distance for vehicles and personnel operating in and around the training area.
- The encroachment of an extensively traveled transportation route as well as training areas along the impact area's Northern edge affords the least stand-off distance from artillery target areas.

- The influence that a new weapon system (M777A2), MACS propellant, and M762 fuse may have on base ejecting projectiles when fired at low angle is currently unknown.

CONSIDERATIONS

- The configuration of the impact area and inadequacies of the Surface Danger Zone (SDZ) do not account for the fall of a functioned base ejecting projectile fired at low angle.
- Current SDZs do not adequately account for the impact of a functioned M825 canister, especially when fired at low angle.
- The influence, either individually or in combination, that the M777A2, MACS propellant, and M762 fuse may have on a functioned M825 canister, fired at low angle, to fall within the limits of an SDZ is currently unknown.
- Currently, downrange hazard areas for debris from base ejecting projectiles are not being accounted for properly. As per the 1979 U.S. Army report (Debris Safety Zones for Base Ejecting Projectiles), the maximum empty shell range can exceed the dud shell range by up to 1,000 meters. To mitigate these uncertainties, an engineering investigation will be conducted by MARCORSSYSCOM and U.S. Army Material Command to determine as to what extent, individually or in combination, the M777A2, MACS propellant, and M762 influence the impact of a functioned M825 canister when fired at low angle.
- Low angle firing of M825 can be unsafe because the canister is on a flatter trajectory. Additionally, the canister loses all ballistic characteristics once the felt wedge payload is expended. Furthermore, the canister may be influenced by an “airfoil” effect; essentially generating lift for the canister which would allow it to travel much farther than expected (these two canisters travelled approximately 1,800 meters beyond their intended targets and into high traffic areas). As previously stated, the maximum empty shell range can exceed the dud shell range by up to 1,000 meters.
- The current SDZ dimensions (specifically “Area A” and “Area B”) for M825 artillery projectiles are inadequate and will be changed upon completion of an engineering investigation conducted by MCCDC and TRADOC.
- The DA PAM 385-63 (Range Safety) publication does not properly account for SDZ Area “A” and “B” requirements for M825 WP artillery projectiles. The current Area “A” and Area “B” dimensions are inadequate (350 meters) and must be expanded to at least 725 meters to safely account for the unpredictable nature of expended M825 canisters.
- Inadequacies of an SDZ to account for the fall of a functioned base ejecting projectile fired at low angle; and/or the influence that a new weapon system, MACS propellant, and M762 fuse may have on a base ejecting projectile fired at low angle is currently unknown.
- Safety of use messages (SOUM) 3-10 and 3-11 were published by TECOM in reference to this mishap.