

# Muzzle Velocity Management During Operation Desert Storm

by Captain B. L. Peyton, USMC

Many field manuals and *Field Artillery Bulletin* articles have discussed the advantages of having an effective muzzle velocity (MV) management system. This includes both managing the spread of propellant lots throughout the battery and battalion and maintaining an accurate data base of individual weapon muzzle velocity variances (MVs). The management system proved far easier to discuss than to implement during Operation Desert Storm. The difficulties encountered when attempting to manage accurate weapon and ammunition information were overwhelming and were the result of three circumstances beyond the control of an artillery battalion.

## The Problems

The first impediment to managing MVs stemmed from a large number of propellant lots being issued for each propellant model (M3A1, M4A2, M119A1/A2 and M203). Firing batteries routinely drew two and sometimes three lots for each propellant model in position. None of these lots were common among the firing batteries. The battalion fire direction officer (FDO) was faced with six to eight propellant lots on hand for any propellant model; the small size of each lot prevented spreading one or two across the entire battalion. Unfortunately, the ammunition supply point (ASP) personnel proved insensitive to the requirement for issuing homogeneous lots to individual artillery battalions.

The second stumbling block encountered in MV management was the lack of any data base for the M119A1/A2 and M203 propellant models. This was primarily due to the safety restrictions on firing the higher charges at training ranges. Further, we didn't have enough ammunition earmarked for training to

give us an MVV data base for the higher charges. But because of the pace of the maneuver advance during combat, we used M119A1/A2 and M203 propellants for more than 90 percent of the rounds we fired. Trying to establish a data base during fast-paced combat proved impractical.

The third obstacle to MV management was created by the combination of the number of small lots issued, a lack of a data base for the higher charge propellants and another problem: the nature of the M90 velocimeter. The unit of issue of one velocimeter per firing battery was inadequate. The tempo of this battlefield included short periods of intense firing followed by absolute calm. Adjust fire missions were aberrations, as most fires requested were planned. Trying to move the M90 velocimeter from one weapon to another while measuring velocities during intense firing was impractical. One firing battery tried to do this during an Iraqi counterattack but had to quit as the tempo of firing increased.

The cumulative effect of these problems completely stopped any attempt to manage MVs. Had a data base for M119A1/A2 and M203 MVVs existed and more homogeneous lots of propellants been issued, we could have used the M90 to infer second-lot calibrations, thus meeting the requirement for accurate weapon and ammunition information. But as was the case, the battalion could meet only three of the four requirements for accurate, predicted fire, regardless of our training and knowledge.

## The Solution

The solution to this problem is undoubtedly just as easy to discuss as MV management and, most likely, just as difficult to implement. To prevent these problems from repeating themselves, I recommend the following actions.

•The artillery community must communicate the need for ammunition lot management to the combat service support (CSS) elements who control the ASP. This may require an artillery officer with the CSS element and other artillery personnel at the ASP to ensure the need is recognized and acted upon. Given the size of Marine forces in Desert Storm, this would have to occur at the Marine expeditionary force (MEF) level to ensure across-the-board success.

•We must give firing elements opportunities to establish MVV data bases for the high charges during routine training exercises. This will require close scrutiny of range restrictions to ensure our desire for safe training doesn't handicap preparations needed for combat.

•We need a replacement for the M90 velocimeter. The new device should be easier to move from weapon to weapon, be powered by an internal source and have fewer components than the M90. This would reduce the physical difficulties of obtaining measured MVs for a firing battery.

## Conclusion

The need for accurate weapon and ammunition information is valid—the increased accuracy gained from an effective MV management is indisputable. The challenge lies in removing the obstacles that prevent implementation of the theories.

Fortunately, the Iraqis' overall lack of resolve to seriously resist diluted the impact of our having reduced accuracy stemming from ineffective MV management. The potentially disastrous effects this could have had on effective counterbattery and close supporting fires warrants our fixing the problems now. Next time we may not be so lucky.



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