



mishap

LESSONS LEARNED

MISHAP SUMMARY

Mishap
Explosive (Demolitions)

Damage
N/A

Injury
One (1) Minor Injury

Operation
CONUS Training; Midwest

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Dangerous Demolitions

SUMMARY

An Engineer Company conducting demolitions training detonated two 40 lb cratering charges from a distance of 54 meters. Shortly after “all clear” was called by the range OIC, unit personnel noticed a Marine lying motionless on the ground. The unit Corpsman was called and conducted a head-to-toe examination/vitals check and did not find any obvious injuries, but he noted a large dirt/mud mark in the center of his flak jacket. It was determined that the Marine had been struck by a football-sized chunk of mud/clay and he had just had his “bell rung” so they continued training. Within five minutes of initially being hit with the debris, the Marine stated that his back and chest hurt and reduced breathing was noticed in his right lung. At this point the Marine was evacuated to the Camp fire station and then to a local hospital. Upon arriving at the hospital it was determined that the Marine had two broken ribs and a collapsed right lung.

CONCLUSIONS

- **Direct Cause.** The direct cause of this mishap was a routine violation in that Marines were in uncovered positions well inside the minimum safe distance (MSD) for the amount of explosives used. Per MCO 3570.1C, the MSD for any charge exceeding 4.4 lbs is 300 meters (unless using a missile proof bunker). However, the range in use did not have a covered bunker.
- **Skill-based Error.** The company leadership converted the 80 lbs of explosives used into 34 lbs of TNT-equivalents using the relative effectiveness factor, which was inappropriate. According to the USMC Program Manager for Ammunition, “the DoD considers net explosive weight to be the explosive weight of the item (as printed on the box),” so in reality the unit detonated twice the range limit.
- **Inexperience.** While technically qualified, the Range OIC and RSO were lacking in experience, which may



have allowed negative peer pressure to pervade the training evolution and their failure to enforce the 300 meter MSD.

- **Supervisory Gaps.** There were numerous school-trained Combat Engineers at the Officer and SNCO level on the range that had the training, background, and authority to oversee and safeguard this type of training and could have prevented the mishap from occurring. However, they failed to correct a known problem.
- **Root Cause.** The root cause of this mishap was a lack of adequate refresher training in basic MOS skills. It had been over a year since the unit had last conducted demolitions training. Per the T&R Manual, sustainment training is required every three months in order to maintain proficiency in cratering operations. The deciding factor in selecting the location to detonate the charges was based on the amount of electric firing wire on hand (54 meters) and a lack of comfort using the MK 152 (remote firing device).

LESSONS LEARNED

- Appropriate supervision is essential to the safe execution of all tactical operations.
- Crawl-Walk-Run. The use of a building block style training plan to ensure Marines are properly trained in the execution of their mission essential tasks, and well-versed in the hazards they may face in performing their duties.
- Follow SOPs. Adhering to established rules, regulations, and standard operating procedures is integral to safely executing tactical operations.
- Clearly written SOPs regarding demolition operations are needed in order to ensure there is no room for misinterpretation. It is also essential that leaders and supervisors ask for clarification prior to executing a training evolution if any ambiguity exists, regardless of how minor it may appear.
- It is incumbent on leaders to ensure that training areas and ranges have adequate safety measures prior to conducting live fire or demolitions training.