PROJECT MANAGER SOLDIER WEAPONS

SOLDIER WEAPONS ASSESSMENT TEAM REPORT 6-03

OPERATION IRAQI FREEDOM

31 July 2003

PM Soldier Weapons
PM Maneuver Ammunition Systems
United States Army Infantry Center, Directorate for Combat Developments, Small Arms Division
TACOM - Armament Research Development & Engineering Center

Executive Summary

Purpose. The Small Arms Assessment Team was formed to~~for in~~ support ~~of~~ Project Manager Soldier Weapons (PMSW) ~~to~~ assessment of small arms ~~lessons and issues~~performance during Operation Iraqi Freedom (OIF). T~~he t~~asks were~~as~~ to assess the current state of weapons, ammunition and accessories directly managed by PMSW: M9 Pistol to MK 19 AGL and determine what worked well and what did not.

Background. Since the initiation of OIF, a number of reports have come from the theater describing problems and lessons learned on a variety of soldier equipment including weapons. PM Soldier Weapons chartered a weapons team to conduct a comprehensive assessment of weapons performance in OIF. ~~On 15 May 2003, LTC Jim Smith from the Program Executive Office (PEO) Soldier published lessons learned on all PEO related equipment from Operation Iraqi Freedom (OIF). A number of issues were raised but required further investigation in order to address fully. As a result, PMSW chartered a small arms assessment team to provide details to the issues raised in the PEO Soldier Lessons Learned.~~ **(Editing done by Col. Michael J. Smith, 8/5/2003, 5:38 PM)** The team consisted of representatives from the U.S. Army Infantry Center (USAIC) Directorate for Combat Developments, Small Arms Division (DCD, SAD), Project Manager Maneuver Ammunition Systems (PM MAS), TACOM Armaments Research, Engineering and Development (TACOM - ARDEC), and was led by the Assistant Project Manger (APM) Soldier Weapons. The team conducted a three week in-country assessment from 10 Jun 03 to 7 Jul 03.

Methodology. The team interviewed unit senior leadership and soldiers (primary users) on The Operational Suitability, Lethality, and Maintainability and Reliability of weapons, ammunition and weapon accessories ~~Operational Suitability, Lethality, and Maintainability and Reliability~~ while conducting operations during Operation Iraqi Freedom. Individual and/or group interviews were conducted, depending on the unit's operational tempo (OPTEMPO). The i~~I~~nformation gathered was consolidated to establish a data base for future reference. Unit AARs or published lessons learned were sought for inclusion into the data base. A host of devices were used to capture data points and to establish a photo gallery, video, and audio library for future analysis. Soldier demographics and units were captured ~~on a sign-in sheet~~ in order to exhibit the sample size and grouping. The team's goal was to use this extensive data base and representative sample to corroborate and serve as the basis of the team's conclusion~~(~~s~~)~~. The team then~~Then~~ analyzed the findings and provided recommendations that may~~will~~ affect ~~the requirements determination and definition; materiel production quality and development; and the acquisition process: fielding priority and~~operational requirements, material development, production, maintenance, or fielding priorities ~~schedule~~. **(Editing done by Col. Michael J. Smith, 8/5/2003, 5:43 PM)**

Team Composition. The team ws made up of both combat and material developers. They ~~make-up was representative and adequate for the mission. The user and materiel developers were well represented and~~ jointly interviewed soldiers, analyzed the data, and provided the recommendations as a team. The team members were:

PM Soldier Weapons (Team Lead)
PM Maneuver Ammunition Systems

TACOM – Armament Research Development & Engineering Center

United States Army Infantry Center, Directorate for Combat Developments, Small Arms Division

External Support. The team also received outstanding support from external sources that facilitated the team's mission. Army Materiel Command – Field Assessment Science and Technology AMC-FAST and the Rapid Equipping~~Fielding~~ Force (REF) were well established in the Area of Operation (AOR) and ~~had conducted similar assessments~~provided support. Their familiarity of the AOR and established unit contacts enabled the team to move about and gain access to units more easily. Moreover, this joint effort with AMC-FAST and the REF provided each team insight and assistance in their mission. Soldiers and units expressed shortcomings and desired capabilities to further enhance their operations which translated to Operational Needs Statements, potential interim fixes, ~~(REF)~~ and future requirements.

~~AMC FAST:~~

~~MAJ Robert Johnston~~
~~SFC Sam Newland~~
~~Mr. William Andrews~~

~~Rapid Fielding Force:~~

~~SFC Tim South (Baghdad, Iraq)~~ **(Deleted by Col. Michael J. Smith, 8/5/2003, 7:20 AM)**

Units Interviewed.

Over 1000 soldiers were interviewed from the units listed below.

173d ABN Bde: Kirkuk, Iraq
- 1-508th ABN BN
- 2-503d ABN BN

2-14th IN BN, 10th Mountain Division: Erbil, Iraq

3d Infantry Division
- 3d BDE Cp New Jersey, Kuwait
- 1st Bde, Baghdad, Iraq
- 1-41st IN

4th Infantry Division, Tikrit, Iraq
- 1-22 IN

1st Armored Division, Baghdad, Iraq
- 1-36 IN
- 1-37 AR
- 2-3 FA
- 2-325 AIR, 82d Airborne Division

101st AASLT DIV, Mosul, Iraq
1-502d
2-502d
526th FSB

501st MP Co, Baghdad, Iraq

Major Findings.

Generally, weapons, ammunition and accessories functioned properly and reliably during Operation Iraqi Freedom. However, soldiers and units continue to purchase commercial items, fabricate or resort to field expedience to overcome shortcomings in the AOR.

Operational Suitability:

The Iraqi desert was very challenging and harsh, but the current weapons, ammunition and accessories the soldiers took to battle functioned, withstood the elements and were lethal. The weapons that stood-out were the M2 HMG, M240B MMG and the M4 MWS. The M2 HMG and M240B MMG were praised mostly for their ruggedness and reliability. The weapon's reliability was most important to the soldiers. The M4 MWS' modularity, size and weight was well received by soldiers issued this weapon system. It enabled soldiers to conduct clearing operations in urban terrain and easily transition from day to night operations ~~quickly~~.

Although the M4 MWS was reliable, the team observed light primer indentation occurrences in the M16 series rifles: M4s and M16s. As soldiers locked, loaded and cleared weapons prior to and after operations or as directed, the primer was indented. Upon return to CONUS discussions with weapons engineers revealed that each time a cartridge is chambered in an M16 Series Rifle or M4 Series Carbine, a slight indentation is made on the primer. This is caused by contact of the free-floating firing pin against the cartridge primer as the bolt closes. This is a function associated with normal operation of the weapon. The Army conducted tests to investigate the effects of multiple detents on 5.56mm ammunition. No slam fire, or accidental discharges occurred.

However, cartridges are not intended to be repeatedly re-chambered as this may de-sensitize the primer and/or deform the body of the cartridge case sufficiently to cause misfires. The potential for a misfire may occur in as few as 10 to 20 lock and load cycles of the same cartridge. No misfire occurrences were directly observed from indentations but soldiers relayed some occurrences of accidental discharges when going through the clearing procedures and one soldier experienced a misfire – from a round cycled through the chamber numerous times. Further testing is planned to more accurately quantify these conditions and establish the need of a Maintenance Advisory Message (MAM). **(Inserted by Col. Michael J. Smith, 8/6/2003. 5:46 PM)**

~~It is not clear why this occurrence happens but there may be two results: one, the primer may ignite and discharge the round when the round is chambered, or two, the primer may fail and not discharge the round when intended. No occurrences were directly observed but soldiers relayed some occurrences of accidental discharges when going through the clearing procedures and one soldier experienced a misfire – from a round~~

~~cycled through the chamber numerous times. Further investigation is required to resolve this issue.~~ **(Deleted by Col. Michael J. Smith, 8/5/2003, 10:34 AM)**

As stated above, soldiers rank reliability and durability as key weapon characteristics and are not willing to trade them for anything – to include weight. Similarly, soldiers do not consider the weapon as part of their load, but rather as an enabler. They are willing to carry the weight if the weapon or device increases his lethality. This is best illustrated by soldiers purchasing their own magnified optics and the strong desire to carry an additional sidearm or shotgun for defensive and offensive purposes. Lethality is more important to the soldier than any other consideration or factor.

Figure { SEQ Figure * ARABIC }. A soldier modified M16A4. Note the commercial ergonomic pistol grip, bipod and optic.

Load carrying systems is a prevalent issue in Iraq. Several systems were used in theater: the All-purpose, Lightweight, individual Carrying Equipment (ALICE) Load Carrying Equipment (LCE), Load Bearing Vest (LBV), and the Modular Lightweight Load-Carrying Equipment (MOLLE), but the MOLLE is the only system developed to interface specifically with the Interceptor Body Armor (IBA). The LCE, LBV and the M203 Grenade Vest were too bulky and cumbersome and did not interface well with the IBA, but soldiers used many of the ALICE components and attached them to the IBA. The two units issued the MOLLE attached the pouches directly to the IBA and used other items from the system to carry mission essential equipment. Load carrying issues were less pronounced in these units. Several units and soldiers purchased commercial load carrying systems and/or pouches in order to achieve better form, fit and function with the IBA. A number of commercial items, modifications and fabrications on current items, and field expedient methods were observed to address this issue. Soldiers continue to purchase items from catalogs or the internet from companies such as Black Hawk, Tactical Tailor or Eagle in order to overcome this shortcoming.

Figure { SEQ Figure * ARABIC }. Black Hawk ammunition carrying system purchased by the soldier.

Figure { SEQ Figure * ARABIC }. ALICE ammunition pouches attached to the IBA.

The M4 Modular Weapon System (MWS) is issued primarily to light infantry, Special Forces, and tank crewmen. It was evident that clearing operations in Iraq were not limited to infantrymen, light or mechanized. The majority of the force deployed in Iraq was~~are~~ mechanized units and issued the M16A4 MWS which proved cumbersome in the confines of tracked vehicles and during clearing operations in Baghdad. ~~Combat Support units~~Other soldiers (non-Infantry) were also conducting these types of operations and are typically equipped for personal defense with an M9 pistol. These operations were typically conducted at night, but the majority of the soldiers did not have laser aiming devices, Close Combat Optics (CCOs), or tactical flashlights and did not have the interfaces to attach accessories to the Mil Std. M1913 r~~R~~ail system. Many soldiers used field expedient methods to attach ~~several~~ items.

The majority of Combat Support and Combat Service Support soldiers are vehicular mounted and the M16 is cumbersome to place into operation while in the confines of the vehicle. At times, the length of the M16 is awkward and interferes with MOS specific tasks. Due to combat support and combat service support unit's related tasks and missions, a more compact weapon or carbine may be needed.

Lethality:

It is apparent that the close range lethality deficiency of the 5.56mm (M855) is more a matter of perception rather than factactuality, but there were some exceptions. The majority of the soldiers interviewed that voiced or desired "better knock-down power" or a larger caliber bullet did not have actual close engagements. Those that had close engagements and applied Close Quarters Battle (CQB) tactics, techniques, and procedures (TTPs) – controlled pairs in the lethal areas: chest and head and good shot placement, defeated the target without issue. Most that had to engage a target repeatedly remarked that they hit the target in non-vital areas such as the extremities. Some targets were reportedly hit in the chest numerous times, but required at least one shot to the head to defeat it. No lethality issues were voiced with targets engaged at 200 meters and beyond. It is apparent that with proper shot placement and marksmanship training, the M855 ammunition is lethal in close and long range.

Units deployed in Iraq are experiencing the same issues with the Generation I M68 Close Combat Optic (CCO) raised from Afghanistan. Condensation inside the body, loose power switches, poor durability and short battery life were all primary issues raised. However, units that received improved M68s (Gen II) through the Rapid Fielding Iniative (RFI) did not have any issues – the sights were well received and did not experience the same issues as the Gen I CCOs. All the soldiers equipped with the Gen II M68s reported longer battery life. The antireflection device (ARD) provided an unexpected advantage in Iraq – reduction of glare. Soldiers were able to distinguish the red dot better in direct sunlight.

Magnified optics were used more during OIF. Soldiers and units purchased several types and brands, but the most popular was the Trijicon, Advance Combat Optical Gunsight (ACOG) 4x, a Special Operations Peculiar Modification (SOPMOD) component. Leaders primarily used these sights for target detection and identification, but the majority of the soldiers used the capability to acquire and engage targets. Soldiers were more confident in their ability to engage targets with more precision. There is some debate to the utility of a magnified optic during CQB situations. This item is part of the Rapid Fielding Initiative.

Soldiers voiced a need for an integrated sight. Although the accessories enabled soldiers to acquire and engage targets more effectively, weapon real estate was at a premium. Soldiers were limited to mounting a day or night sight and were required to boresight and/or zero the sights individually each time they were mounted. Soldiers strongly suggested a combinatorial day/night sight with an integrated laser aiming device and capable for close and long range engagements.

As the mission transitioned from combat operations to SASO, soldiers were faced with different situations that did not warrant deadly force. Several soldiers voiced the need for a non-lethal capability. ~~It was apparent that the Infantry Divisions and brigades were not aware that the kits were available in theater.~~ There are six brigade Non-lethal Mission Capability Kits (NLMCK) in theater, but they are allocated to the Provost Marshal. It was apparent that the Infantry Divisions and brigades were not aware that the kits were available in theater. This issue was an~~more related to~~ asset visibility and logistics issue, but units began to requisition the NLMCK upon notification of its availability.

Maintainability/Reliability:

Though were minimal maintainability and reliability issues raised, a number of universal issues were voiced related to the M249 SAW maintainability, the M203 durability, lubrication types, and magazines. SAW gunners were unanimously dissatisfied with the complexity of the M249 SAW. Its numerous small parts encumbered field stripping and were easily lost. Some SAW gunners resorted to extremely unorthodox methods to retain weapon availability. The M249 SAW was the most problematic weapon in the theater.

Figure { SEQ Figure * ARABIC }. M249 SAW with field expedient repair.

The biggest issue among M249 SAW gunners is the 200 round plastic ammunition box. Some box and weapon interfaces were observed as weak and unreliable. SAW gunners consistently remarked that the box habitually falls-off no matter the movement technique: walking or rushing. The spring tension is insufficient to retain the box in the slot. Soldiers are using bolts, screws or wire to act as a retaining pin in order to keep the box from slipping from the slot. The box was extremely brittle and prone to break, especially at the box and weapon interface. Discussions with weapons engineers upon return to CONUS revealed that the weak interfaces were previously addressed in a change of the plastic ammunition box design. Some of the problems encountered may have been due to issue of the old design ammunition boxes. Also, the ammunition tends to rattle against the box and soldiers were using MRE cardboard or moleskin to buffer the noise. However, the M249 SAW 100 round soft Combat Ammunition Pack (CAP) was universally praised and was preferred over the 200 round plastic box. Gunners conveyed that they would rather repack their ammunition basic load in several 100 round soft pouches than use the 200 round plastic box. **(Inserted by Col. Michael J. Smith, 8/5/2003, 1:57 PM)**

The M203 GL was most affected by the desert environment. Sand and dirt migrated into the trigger housing and clogged or jammed the safety. This issue is compounded by excessive lubrication. Fine powdery sand easily entered this area and could not be prevented without placing the weapon in a hermetically sealed bag. Additionally, the hand guards tended to slip-off. It is believed that the extreme heat caused the glue to melt and the bonding properties to break-down.

No one type of lubricant stood-out as the best in OIF. A wide variety was used to include: CLP, Graphite, Motor Oil, Strike Hold®, LSAT, Gun Wipes®, and~~or~~ Mil Tech ®. But no matter the lubricant, the common denominator was periodic maintenance. Every soldier described cleaning the weapon, applying lubrication, removing the excess lubricant and periodically brushing-off the dust. When soldiers conducted daily operator level maintenance and applied a light coat of lubricant (regardless of type) to the weapon, the weapon functioned reliably. The best lubricant of all was determined to be soldier elbow grease. **(Inserted by Col. Michael J. Smith, 8/5/2003, 1:59 PM)**

Numerous weapon magazine reliability issues were cited by soldiers. Many of the M16 series and M9 magazines exhibited the same issues raised in Afghanistan. Several of the magazines ~~were~~ failed~~ing~~ to feed. It is evident that the spring tension was~~is~~ inadequate to feed the rounds in several magazines observed. Some of the M9 magazines had no tension at all. Several observed M16 magazines were difficult to seat in the weapon, or the feed lips tended to spread apart. Soldiers resorted to loading less than 30 rounds into the magazine. These issues may be attributed to worn out magazines ~~ammunition loaded in the magazine for an extended time~~ and from a lack of maintenance. However,~~, but~~ these issues were not cited with the Beretta® or OKAY® magazines. OKAY® magazines were fielded under the Rapid Fielding Initiative.

~~The biggest issue among M249 SAW gunners is the 200 round plastic box. The box and weapon interface is weak and unreliable. SAW gunners consistently remarked that the box habitually falls-off no matter the movement technique: walking or rushing. The spring tension is insufficient to retain the box in the slot. Soldiers are using bolts, screws or wire to act as a retaining pin in order to keep the box from slipping from the slot. The box is extremely brittle and prone to break, especially at the box and weapon interface. Lastly, the ammunition tends to rattle against the box and soldiers are using MRE cardboard or moleskin to buffer the noise. On the other hand, the M249 SAW 100 round soft pouch was universally praised and was preferred over the 200 round plastic box. Gunners conveyed that they would rather repack their ammunition basic load in several 100 round soft pouches than use the 200 round plastic box.~~ **(Deleted by Col. Michael J. Smith, 6/5/2003, 11:33 AM)**

Equipment Shortcomings – Unit or Individual Purchases:

Due to fielding priorities, many units deployed to~~in~~ OIF were not fielded items from the RFI. In fact,~~, but~~ the majority of the units that deployed to OIF did not receive RFI and were forced to supplement individual equipment with unit or personal purchases. Some soldiers were~~are~~ purchasing these items from catalogs while deployed. The items range from load bearing equipment to weapon sights and optics. Many, if not all these items are standard Army issue and are available in the supply system.

Some of these items are listed below:

- Rifle Accessories:
  - Magnified Rifle Optics (Trijicon, Leupold, or Bushnel etc…)
  - Reflex Sights (EO Tech or Trijicon)
  - Tactical Flashlights (Surefire)

  - Bipods (Harris)
  - Back-Up Iron Sights (KAC or Swan)
  - Tactical Slings (Black Hawk, Spec. Ops etc…)

- Sniper Accessories
  - Spotting Scope (Leupold)
  - Ballistic Tables
  - Log Book (Black Hawk)
  - Camouflage Paint
  - Improved Bipod (Harris)

- Load/Ammunition Carrying System(s)
  - MOLLE-type pouches for IBA (Black Hawk)
  - Ammo Bearer Bags (Tactical Tailor or London Bridge)
  - Three-Day Assault Packs (Black Hawk or Eagle)
  - Tactical Vest (Black Hawk)

- Tactical Pistol Leg or Shoulder Holsters (Black Hawk)

- Pistol Visible Aiming Laser

- Crew-Served Weapon Sighting Systems (Israeli Wheel)

Conclusions.

Soldiers are confident that their weapons systems will defeat any threat in Iraq and they are generally well maintained, despite harsh and extreme desert conditions. ~~On the same token, soldiers will~~They have and will do what ~~-~~ever it takes to keep their~~his~~ weapons functional. ~~Additionally, u~~Units and soldiers were forced to procure commercial items to meet shortcomings in equipment – before and during operations. However, u~~U~~nits that received items (four brigades) through the Rapid Fielding Initiative had minimal equipment issues.

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