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### Ammunition Quarterly

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### From the Program Manager



Mr. Jerry Mazza

Program Manager for Ammunition

Welcome to the October'01 edition of the Program Manager for Ammunition, Marine Corps Systems Command's "Ammunition Quarterly." Past editions of this publication have included a wide array of technical information. Many articles however attempted to educate the ammunition community in general on the complex, macro-level, joint ammunition management challenges we all face. Similarly, I believe this publication will provide useful information related to both new and refurbished munitions items as well as where we are going in the Ammo Systems arena. You will find a very informative article on our current efforts in replacing the current generation

of smoke pot with a Foreign Comparative Testing led effort. Ms. Ann Jackson of my staff prepared a very good synopsis of this program.

In addition to the Floating Smoke Pot, I draw your attention to the "nematodes" article. Like many other commodity areas, ammunition is significantly affected by the recent European Union decisions to regulate coniferous non-manufactured wood. We have met with HQMC staff on this issue and will continue to work with higher headquarters to mitigate, to the maximum extent, impacts to our ammunition logistics support. Please take moment to read this information. While nematodes may not be of great interest unto themselves, their impact to our efforts in ammunition support, as well as any commodity involving potentially affected wood, can be significant.

As the Primary Inventory Control Point (PICA) for the Linear Demolition Charge (LDC), we have recently entered into efforts of improving reliability based on design changes of the LDC. To augment those changes, refinement of Operator Instructions to mitigate operator error should prove valuable in reducing the number of malfunctions we have experienced.

As we all know, virtually every action dealing with ammunition, be it my staff here at Quantico, or within your respective organizations, starts with the state of the stockpile. That understanding coupled current level of activity has further validated my intent our commitment to ensure we have total asset visibility for Class V (W) and, it all revolves around Ammunition Information Systems. There has been much activity within the systems arena, from the demise of the Joint Ammunition Management Standard System with its wholesale implications, to filling a deficiency with the Training Ammunition Management Information System-Reinvented (TAMIS-R).



Because this is so critical to all that we do, I ask you to take a few moments and read the article provided by Ms. Hellgrath. It is the future state of Ammunition visibility!

Semper Fi,

# Floating Smoke Pot Foreign Comparative Test Program

*Ms. Ann Jackson, MARCORSYSCOM (PMAM-RDA)*

The Foreign Comparative Test (FCT) Program is an Office of the Secretary of Defense (OSD) sponsored program that aids Program Managers in funding the testing of munitions and systems that are produced by foreign countries. The program funds testing of foreign items to assess their suitability for use in the Department of Defense (DoD).

For the year 2001, PMAM is working on a replacement system for the Floating Smoke Pot M4A2 (DODIC K867). The existing K867 produces smoke that possessed carcinogenic properties and a fuze that has experienced reliability problems.



*Demonstration of smoke density, KM03 Smoke Pot*

Comet Pyrotechnik, a German munitions manufacturer, is currently producing a similar product and is working with the Program Manager, Ammunition to develop a system that will meet Marine Corps requirements and remain friendly to the user and environment. Comet has extensive experience with smoke products and currently

has fielded a similar system to our M4A2 Smoke Pot that is non-toxic and with no fuze reliability issues.



The benefits to the DoD, and Marine Corps in particular include: reduced fielding time; a more reliable fuze; environmentally friendly filler; and reduced research and development costs. By using the FCT Program, this round of ammunition can be fielded earlier since a majority of the acquisition requirements, to include the research and development, environmental and functional testing have been addressed or satisfied. This is within the spirit of the FCT Program, which is primarily designed to field systems that are already in use in foreign Services. Additionally, FCT programs serve to strengthen U.S. and other country alliances while aiding the industrial bases of both countries.

The new floating smoke pot now has a DODIC, KM03, and the Marine Corps is catalogued as a user. KM03 now has an interim hazard classification (IHC), and by the end of August 2001, a contract will be in place with Comet Pyrotechnik to build and test rounds for procurement within the next two fiscal years. O

*Ms. Jackson is currently on a rotational assignment to DCS/Logistics, Pentagon. CWO3 P. Barack, MARCORSYSCOM (PMAM-RDA) will be assuming management responsibility for this item. He may be reached at Comm: (703) 784-9397 or DSN: 278-9397.*

# M58 Series Linear Demolition Charge Conversion Program

*Mr. Don Peters, Naval Surface Warfare Center Crane Division*

One of the many tasks of MARCORSYSCOM PMAM is to maintain an inventory of safe, reliable Class V (W) supplies to support the Fleet Marine Force. The Marine Corps analyses and monitors all aspects of their ammunition posture on a daily basis to complete this task.

The task appears to be relatively simple in that ammunition is expended and replaced through acquisition of new ammunition. However, there are alternatives to buying new ammunition. Repair of unserviceable ammo, recycling of obsolete ammo, or installing product improvements to existing ammo can result in a cost savings while still providing the fleet with safe reliable ammo. Marines in the ammunition field are known for resolving tenacious problems and at the same time getting a bang for every buck they spend. An example of this is the M58 series Linear Demolition Charge (LDC). MARCORSYSCOM PMAM utilized its personnel pool, to not only realize a cost avoidance, but also resolve a highly publicized problem area with the LDC. LDC available in South West Asia had a reliability of 24 percent or lower and if the charge did deploy and detonate it was usually because a street smart Marine made a field modification to the charge.

To increase the reliability of the LDC, design and operator instruction charts were developed by Naval Surface Warfare Center (NSWC, Crane), Crane Division Code 403. The design changes were tested and fine-tuned by personnel from NSWC, Crane Codes 403 and 409 (MCPD Fallbrook). By incorporating the modifications into existing LDCs, reliability has increased to 94-98 percent. Examples of the design modifications include an arming wire weave, taping of electrical wires on the opposite side of the arming wire weave and enlargement of the fuze connector quick release pin alignment hole. These modifications greatly reduced the occurrences of broken electrical wires,

broken arresting cables and quick release pins failing to seat. Operator error has been reduced by including new Operating Instruction Charts with each LDC. These charts detail all the steps necessary to correctly install and deploy the LDC. Future safety improvements include the addition of a re-designed fuze that is ESD and HERO safe, removal of excessive electrical wire from the fuze connector rear half electrical connector and a re-designed shorting loop. The current serviceable inventory of LDCs requires no field modifications and can be deployed simply by following the Operating Instruction Charts. One set of cards will accompany each M913 LDC. Unserviceable LDCs in the inventory are being converted to the preferred configuration instead of following the old school of thought; sentencing the ammo to Condition Code "H" for demilitarization.



LDC's Sentenced to Condition Code "H" are being utilized in two different areas, C-4 recovery and conversion of the older condemned M58 series slope nosed containerized LDC. Recovered C-4 is being utilized to produce M757 kits and M023 charges. Conversion consists of making a M58A4 LDC out of a M58A2 LDC. The conversion requires removing the charge from the sloped nose MX11 container, extensive examination/inspection of the main charge, incorporation of new components and arresting cable. These changes insure that the charge conforms to the latest M58A4 system requirements. The conversion is complete with loading the charge into refurbished M58A4 rectangular type shipping and storage container and the

*Continued on page 4*

*LDC Conversion . . . . Continued from page 3*

completion of the documentation including new ammunition data cards.

The greatest challenge in the conversion program has been the refurbishment of excess M58A3/A4 shipping and storage containers. A new M58A4 container cost the Marine Corps more than \$2,400.00. Refurbishment of existing containers to like new has an average cost of less than \$500.00. In order to accomplish this, the ISEA worked with two organizations that had outstanding cost saving histories on previous Marine Corps programs. One of the organizations is a small woman owned company, Armor Metal Group at Madison, IN, that makes and refurbishes metal containers. The other is an association of 500 disabled persons, Knox County Association for Retarded Citizens (KCARC), Vincennes, IN, that currently makes a number of items for Navy/Marine Corps. Production varies from dress uniforms to wooden and metal ammunition containers/pallets. KCARC had previously reduced the cost of Canine Scent Kit boxes from a system price of \$180.00 to \$29.00 with outstanding quality. The ISEA worked with KCARC to establish a rework plan of the M58A2 long lid to make a M58A4 short lid panel resulting in a cost saving of \$395.00 per panel.

The conversion effort is over 30 percent complete. Final completion is expected in the spring of 2002. It is expected that when the conversion is completed, the Marine Corps will have over 1,000 units. At today's replacement cost, 1,000 units would cost the Marine Corps approximately 31 million dollars. It is anticipated that the conversion project will cost a little less than \$4 million.

The PMAM retains a Core group of Engineers, Technicians, Program Analyst, Logisticians and Configuration Management Specialists located at NSWC, Crane Division. Through them PM-AM is able to accomplish numerous tasks associated with procurement, quality assurance, inventory management and maintenance of the complete Marine Corps ammunition inventory. This is another example of the Marine Corps being able to accomplish more with less.  
O

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## **NO Joke. . . Attack of the Nematodes!**

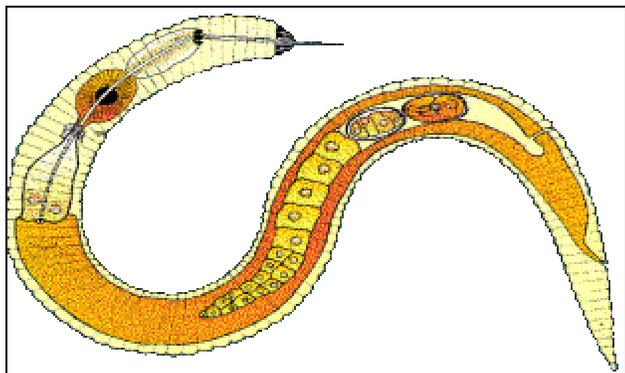
*Mr. Edmond Lettinhand and Ms. Anna Smith,  
MARCORSYSCOM-PMAM/SYS/EES*

Nematodes have recently become of prime interest to the Munitions community. The European Union (EU, comprised of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, Ireland, The Netherlands, Portugal, Spain, Sweden and the United Kingdom), on March 12, 2001 issued an emergency decision to regulate coniferous non-manufactured wood materials. This decision placed the Nematode in the forefront of munitions issues that may affect all DoD munitions stockpiles.

The EU has been concerned with an infestation of their countries by the pinewood nematode (PWN = *Bursaphelenchus xylophilus*) for several years. Nematodes were found to be entering European countries by shipments of goods on pallets, skids, crating, packing blocks, drums, and cases made of coniferous wood. Conifer wood is any of various types mostly needle-leaved or scale-leaved, chiefly evergreen, and cone bearing gymnospermous trees or shrubs, such as pines, spruces and firs. Nematodes feed on plants using a miniature hypodermic needle-like structure called a stylet. They suction out the contents of the plants cells one by one. A plant parasitic nematode completes a life cycle in 3-4 weeks. Some have longer life cycles, up to 1-2 years. During this life cycle their primary mission is to eat and lay eggs. After killing the plant, the nematode will die but the eggs left behind can lay dormant until soil and water carry it to infect other plants. Nematodes can be found in solid wood packing material under areas that have bark or in holes larger than 3 mm. This excludes plywood, particleboard, oriented strand board, veneer, wood wool or any product that was created using glue, or a combination of heat and pressure. Non-Manufactured Wood Packing (NMWP) or Solid Wood Packing Material (SWPM) are the acronyms used to describe the affected material.

In response to the Nematode initiative, a joint task force that included all DoD agencies was established to

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*Nematode's...Continued from page 4*

**Nematodes are microscopic worms with transparent outer skin. It would take about 800 to cover a thumbnail.**

develop plans to address this issue. During September 2001, representatives from DoD will meet and brief the EU on a proposed plan that supports this initiative. From this meeting, DoD will provide definitive guidance on this initiative.

Effective 1 October, all shipments containing NMWPM departing CONUS for a EU member country must be constructed using heat-treated wood. In order to comply the following actions are being taken. All new acquisitions and re-buys will include the following contract clause: "Wooden containers, boxes, crates, reels, pallets, etc. produced from Non-Manufactured coniferous wood shall be constructed from Heat Treated (HT) material (HT to 56 degrees centigrade for 30 minutes) and certified by an accredited agency recognized by the American Lumber Standards Committee (ALSC) in accordance with ALSC Non-Manufactured Wood Packing policy and Non-Manufactured Wood Packing enforcement regulations, both dated May 30, 2001."

All Non-Manufactured coniferous wood (i.e., pallets, lumber, containers, reels, boxes, crates) procured locally must be heat-treated (HT to 56 degrees centigrade for 30 minutes) as certified by an accredited agency recognized by the American Lumber Standards Committee (ALSC) in accordance with Non-Manufactured wood packing policy and non-manufactured wood packing enforcement regulations, both dated May 30, 2001, and marked accordingly.

If IMPAC cards are used to buy NMWPM, lumber and/or products packed with NMWPM, the

purchaser must ensure the lumber and NMWPM are HT and marked accordingly. Previously packaged items, pallets, boxes, crates, reels, etc., constructed using untreated non-manufactured coniferous wood should be used to fill order requests for shipment to non-EU countries.

The Defense Logistics Agency's defense supply center Philadelphia (DSCP) (S91) has changed the item descriptions for current coniferous wood pallet NSN's to require Heat-Treated material and certification. The DSCP also requires hardwood pallets be stamped "NC" (Non Coniferous) along with the cage code and date of manufacture. Since hardwood is not in the EU restrictions, this will allow identification and obviate inspection or heat-treat. Markings, documentation or certification requirements will be subject of future guidance.

For MARFORS and COMMARCORMATCOM near-term focus should be on identifying NMWPM held by units scheduled to deploy to the European theater in the next six months. Long-Term goal is to develop POA&M to bring all deploying units and supplies into compliance by 1 October 2002.

The following are not immediately affected by EU restrictions. Landing Forces Operational Readiness Material (LFORM) and material aboard Maritime Propositioning Force (MPF) loaded prior to 1 October 2001. Units presently deployed and those departing the U.S. on deployment prior to 1 October 2001. The intent is to ensure all wood pallets, boxes, and packing material on vessels and at propositioning sites is of compliant HT wood during the next scheduled rotation cycle.

The PMAM has assigned representatives in the development process of the POA&M. These representatives will provide the knowledge base of for all Class V (W) assets. O

*Mr. Lettinhand and Ms. Smith are currently assigned to MARCORSYSCOM-PMAM, and may be reached at DSN 278-9160 and 9484 respectively.*

# PASSIVE DEFENSE CONSTRUCTION: TRUCK BOMB QD

*Mr. Greg Heles, U.S. Army  
Defense Ammunition Center and School*

The purpose of this article is to assist the user in the design/implementation of passive construction features that improve survivability from terrorist car/truck bomb attacks.

Separating the building(s) to be protected from the suspected detonation site by the greatest possible distance is the best way to protect personnel inside. Keeping the initial explosion as far away as possible will reduce damage to the structure(s) and debris/glass hazards. In lieu of distance, barricades can be built and the structure can be hardened, but these are costly semi-effective solutions. Unstrengthened buildings are expected to sustain damage up to 20% of total value, but remain standing.

Personnel may suffer temporary hearing loss from the overpressure. Personnel may suffer serious injury from primary or secondary (building debris) fragments. Plate glass will shatter and be projected into the building with considerable velocity. Laminated glass will break but will remain in the frame of the window.

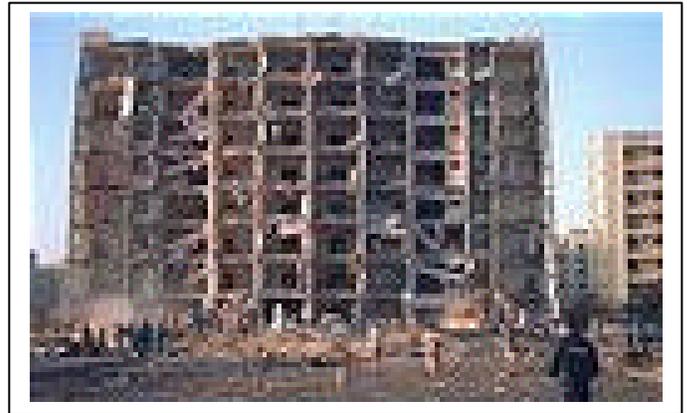
Expected damage from a car/truck bomb can be computed. The overpressure (in pounds per square inch) experienced at a set distance is a multiplication factor (K factor) times the cube root of the explosives weight involved. For example, the cube root of 1000 is 10, so the distance required to provide K24 protection from a detonation of 1000 lbs of high explosives is 240 feet ( $24 \times 10 = 240$ ). K- Factor is a term that is used within the explosives safety community. There are sets of K- factors (K=24, K=40) where the physical effects of a bomb blast are known. The following is a summary of the effects expected at 'survivable' K-factors:

a. K18 (3.5 psi)

1. Unstrengthened buildings are expected to sustain damage approaching 50% of replacement value.

2. 1% chance that personnel will suffer eardrum rupture. Serious injury and death are possible from fragments, debris or firebrands.

3. Plate glass will shatter and be projected inward with considerable velocity. Laminated glass will break but be retained in place if in a strong frame.



*Kobar Towers after Truck Bomb Attack*

b. K40 (1.2 psi)

1. Unstrengthened buildings are expected to sustain damage of up to 10% of total value, but remain standing.

2. Personnel in the open are not expected to be injured by the blast. Personnel may suffer serious injury from primary or secondary fragments.

3. 90% chance that plate glass will shatter and shards will be projected into the building. Laminated glass will break but will remain in the frame of the window.

c. K88 (.4 psi)

1. Unstrengthened buildings are not expected to be damaged unless struck by a fragment.

2. Personnel may suffer serious injury from primary or secondary fragments.

3. 10% chance that plate glass will shatter, however, any shards produced will not be propelled far into the room. Laminated glass is expected to survive unless struck by a fragment.

d. Distances have been computed to provide these levels of protection from a detonation of 100, 500,

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1,000; 5,000, and 10,000 lbs of high explosives. These distances are:

K Factor	100 lbs	500 lbs	1,000 lbs	5,000 lbs	10,000 lbs
K18	84 ft	143 ft	180 ft	308 ft	388 ft
K24	112 ft	191 ft	240 ft	410 ft	517 ft
K40	186 ft	318 ft	400 ft	684 ft	862 ft
K88	409 ft	700 ft	880 ft	1505 ft	1896 ft

Protection from fragments - Defeating Fragments can be difficult and expensive. High velocity, low angle fragments can be stopped by earthen barricades or robust concrete construction. High angle, lobbed fragments can penetrate roofs but strengthening roofs adds considerable weight to the structure.

Protection from glass shards - Shards produced by the breaking of glass windows can cause significant casualties at a great distance from the explosion site. Eliminating windows from the side of the structure facing the expected blast is prudent. Replacing windows with laminated glass is also effective. Fragment retention films that adhere to glass windows are available and when backed up by an anchored curtain (which catches the window should the entire window break inward) make a good short term fix to an existing structure. Placing masking tape on the inside of the window is not effective at K factors below 40.

Recommendations:

a. Separate the structure from a vehicle checkpoint as far as possible. Put parking areas well away from the structure. Do not allow routine parking adjacent to the building.

b. If you eliminate glass shards as a hazard you have reduced the need for distance. Beyond the K24 distances the primary hazard to personnel is glass shards. Use laminated glass where possible, particularly with new construction. Consider using the fragment films and curtains as a solution for existing buildings. O

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# AMMUNITION INFORMATION SYSTEMS

*Ms June Helligrath, MARCORSSCOM-PMAM/IMSD*

Logistics Command and Control (C2) has been an issue for quite sometime with many endeavors undertaken, planned, and in progress. Probably the single most important endeavor is that of the Global Combat Support System (GCSS).

GCSS is envisioned to be a family of systems with each Service having its own GCSS, the Corps being known as GCSS (MC). GCSS requirements are articulated in the CINC-129, calling out such things as the need to "provide timely and accurate information on the location of Class V Ammunition" which is requirement #11 of the CINC-129. Specified/implied essential elements of information under requirement #11 are further identified as follows:

**Joint war fighter is looking for visibility of class V, ammunition, on-hand, in-transit or awaiting shipment. The information must be current, real-time with projected departures and arrivals through each node of the distribution system.**

- ?? **Graphically depict the flow of class V within the theater of operation, expected arrival time, and depict bottlenecks or delays within the nodes of the distribution system.**
- ?? **Project the readiness impacts of in-bound class V shipments will have on the overall operation.**
- ?? **Provide drill down capability to find specific class V information, by National Stock Number and DODIC's to determine exact location.**
- ?? **Provide an analysis to graphically portray the impacts of shortages or delays in the distribution of class V on the operation over time.**
- ?? **Provide an analysis / logistics estimate as to the projected usage of class V over the duration of a**

**mission to assess the impacts on readiness.**

**?? Graphically portray the projected usage of class V against availability (including inbound shipments) and the impacts on the prescribed operation.**

**?? Identify transportation requirements via air, road, rail and sea IAW prescribed safety standards and restrictions.**

The need for a comprehensive ammunition family of systems, which are interoperable covering the complete supply chain from production to expenditure, is essential. Even before the identification of GCSS, the services' ammunition communities embarked on an endeavor to develop an Ammunition Management Standard System (AMSS), which evolved to the Joint Ammunition Management Standard System (JAMSS) which was recently terminated.

With the termination of JAMSS, the Corps ground ammunition community was faced with identifying an alternative that would meet the needs of CINC 129 and include accuracy and latency. Our current Class V (W) Inventory Control Point system, MAARS II, cannot meet latency requirements in that it is a batch-processed system. As we analyzed possible alternatives, one of which was modernizing MAARS into an open system environment by making it web enabled/based, led us to collaborate with our Navy counterparts at the Naval Ammunition Logistics Center (NALC) Mechanicsburg.

We currently utilize the Navy's retail information system known as the Retail Ordnance Logistics Management System (ROLMS) at our retail sites/ammunition supply points (ASPs). ROLMS is also used by our aviation ordnance community to manage the Corps Class V (A) assets. It should be noted that the ICP level system for our Class V (A) is the Navy's Conventional Ammunition Integrated Management System (CAIMS). As we dialogued with the Navy, it seemed a logical progression to possibly adapt their ICP level system.

CAIMS, in its current configuration, is unable to meet the requirements but the Navy is finalizing roll out of CAIMS-OSE the modernized, web-based version of CAIMS Legacy. It is our intent to transition to CAIMS-OSE during June 02 if analysis proves it to meet our needs. If we are unable to transition during or

NLT June 02, we will hold the transition in abeyance until after 30 Sep so as to not jeopardize the accuracy of the year-end inventory.

Another on-going endeavor is System Realignment and Categorization/Consolidation (SRAC). SRAC address's the large number of legacy systems with redundant capabilities. We are an active participant in this process striving to ensure we minimize ammunition information systems. Prior to SRAC, we were sensitive to system proliferation and have adhered in theory to our migration plan identified in USMC Logistics Information Resource (LG IR) Plan 1998-2003 Version 2.0, July 198.

A missing piece to the end-to-end (production to expenditure) is a capability below the retail level, which are those assets in the hands of the unit or log train. This office has submitted an E-Business initiative to develop a prototype. We are confident we can address this piece. Although the piece we speak of is more specifically tied to contingency operations, it also has applicability to training operations. We are trying to bridge this deficiency with an application known as Training Ammunition Management Information System-Reinvented (TAMIS-R). This application is an Army developed system used to manage training assets.

The Army requested that we utilize TAMIS-R to forecast our ammunition requirements for training at their facilities. TAMIS-R has great forecasting capabilities, but currently isn't compatible with ROLMS for file transfers, which is crucial to eliminate the need for hand manipulation of data. The MARFORs felt TAMIS-R could serve as a bridge addressing training ammunition forecasting until a hybrid of both systems was developed. As such we are requesting the necessary protocols be established within TAMIS-R to facilitate our use.

In closing, as we work towards Naval commonality of ammunition information systems, we are actively participating in the Business Process Model (BPM) reviews that will assist in the development of a comprehensive Ordnance Information System (OIS). Our next issue will contain articles on TAMIS-R and OIS. O

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