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Training in Multiple Launch Rocket System Units

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for

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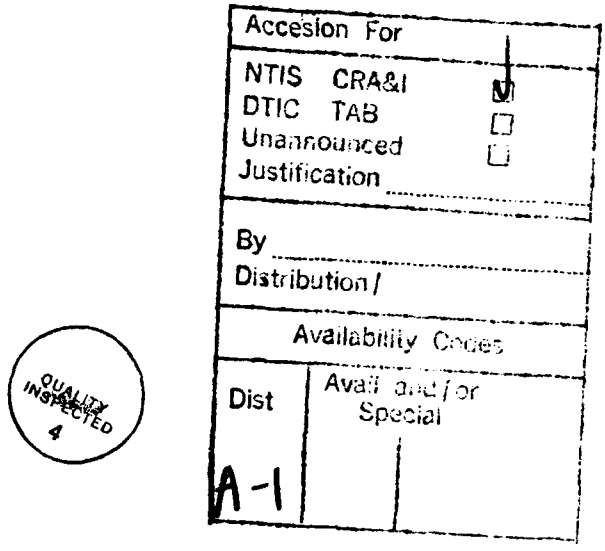

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For this report, researchers used a survey to determine the status of training and performance proficiency in five field artillery units equipped with the Multiple Launch Rocket System (MLRS)--two MLRS battalions and three MLRS separate batteries. Ninety-eight interviews with 225 unit personnel were conducted. Questionnaires on unit performance, training detractors, and training resource availability were completed, and documentary material on training was gathered from units. Researchers analyzed the information gathered to determine the guidance available to MLRS units for training, the training that was planned and actually conducted, the performance evaluation methods used, the training issues and problems encountered by units, and the relationships between these conditions and unit performance proficiency (reflected by confidence of unit members and higher echelon representatives in units' ability to successfully perform collective tasks). They concluded that MLRS units do not presently train in accordance with doctrine for employment of MLRS in combat. A number of factors contributing to this situation were identified and recommendations for improving training in MLRS units were formulated.

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SECTION ONE

INTRODUCTION

This report presents the findings of a study of training in Field Artillery units equipped with the Multiple Launch Rocket System (MLRS). The study was sponsored by the Individual and Unit Training Directorate, Department of Training Development, U.S. Army Field Artillery School, Fort Sill, Oklahoma. Impetus and funding for the study were provided by the Standards in Training Commission within Headquarters, U.S. Army Training and Doctrine Command (TRADOC). The study was carried out by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), Presidio of Monterey, California Field Unit, with contractor assistance from Applied Science Associates, Inc., Butler, Pennsylvania.

This section of the report consists of three subsections. The first is a brief discussion of the focus of the study—the MLRS system and units to which it is assigned. The second subsection discusses the history of this study. Finally, the specific goals of the study are presented.

The Multiple Launch Rocket System and MLRS Units

MLRS is a Field Artillery rocket launching system. The basic MLRS system consists of an M270 Self-Propelled Loader-Launcher (SPLL, also referred to as a launcher or a fire unit). The launcher is a tracked vehicle carrying a crew cab, a Loader-Launcher Module (LLM), a Fire Control Panel (FCP; in the crew cab) and navigational and launcher support electronics and various support subsystems. Launcher communications equipment consists of one AN/VRC-47 radio. The LLM can be trained and elevated and contains two expendable Launch Pod Containers (LP/Cs) with six rockets each. Three types of LP/Cs are in use: the M26 tactical LP/C; the M27 inert training LP/C; and the M28 practice LP/C. The rockets have an unclassified range of 8 to 30 kilometers. Each M26 tactical rocket disperses 644 Dual Purpose Improved Conventional Munitions (DPICM) over the target area. AN MLRS launcher is capable of launching one rocket every 4.7 seconds under ideal conditions; an entire launcher load ("12-pack") can be fired in under a minute. One launcher load of MLRS fire is the approximate equivalent of 3.88 155-millimeter howitzer battalion volleys in terms of munitions on target.

Due to the ease of detection by radar of MLRS rockets in flight and the large firing signature of a rocket launch, MLRS units use dispersion and mobility to avoid counterbattery fire. MLRS "shoot-and-scoot" tactics involve waiting in covered and concealed hide positions until fire missions are received. Launchers then move to preselected firing positions, launch, and proceed to new hide positions or reload points, as dictated by the situation. Using these tactics, an MLRS Platoon (with three launchers) nominally occupies a 3 by 3 kilometer area with approximately nine firing points. Once each of the firing points has been used, the Platoon must relocate to another area, either simultaneously with relocation operations of the Platoon's parent MLRS Battery, or under Battery direction.

Because MLRS units can expend ordnance so rapidly, each MLRS Battery is provided with organic resupply assets. In addition to its Firing Platoons, each MLRS Battery contains an Ammunition Platoon equipped with 18 M985 Heavy Expanded Mobility Tactical Trucks (HEMTT), each with an M989 Heavy Expanded Mobility Ammunition Trailers (HEMAT). Each HEMTT/HEMAT can transport 12 LP/Cs (8 on the HEMTT, 4 on the HEMAT).

MLRS Unit Organization

The fundamental unit of MLRS organization is the Battery. Each MLRS Battery consists of three Firing Platoons, an Ammunition Platoon, and a Headquarters Platoon. Some MLRS Batteries are organized into MLRS Battalions under the control of Corps Artillery. Other MLRS Batteries are separate batteries under the control of Division Artillery.

Firing Platoon Organization. Each Firing Platoon consists of three Firing Sections plus a Platoon headquarters element. The Platoon headquarters element consists of a Platoon Leader, Platoon Sergeant, Reconnaissance Sergeant, a Battery Display Operator, two Fire Direction Specialists, and a Light Vehicle Driver.

Each Firing Section is the crew of one launcher, made up of a Section Chief, a Gunner, and a Driver. All Section-level positions are authorized as Military Occupational Specialty (MOS) 13M.

The Platoon headquarters element is equipped with one M577 Command Post Vehicle, two AN/VRC-46 radios, either a Fire Direction System (FDS) or an AN/PSG-4 Platoon Leader's Digital Message Device (PLDMD), and two 5/4-ton High-Mobility Multipurpose Wheeled Vehicles (HMMWVs) with AN/VRC-46 radios. The Platoon Leader and Driver normally use one of the HMMWVs; the Reconnaissance Sergeant uses the other. The Platoon Sergeant and the fire direction personnel normally use the M577 Command Post Vehicle.

Ammunition Platoon. The personnel and equipment of an MLRS Ammunition Platoon are shown in Figure 1.

Headquarters Platoon. The MLRS Battery Headquarters Platoon consists of the Battery Headquarters Section and Mess, Supply, Maintenance, and Communications Sections.

The Battery Headquarters Section includes the command element (which sometimes functionally serves as the Battery Operations Center [BOC]); the Fire Direction Center (FDC); a Nuclear, Biological, and Chemical (NBC) Noncommissioned Officer (NCO); and a Position and Azimuth Determining System (PADS) Party.

The Battery command element includes the Battery Commander, the Battery First Sergeant, the NBC NCO, the Battery Communications Chief, and a Communications Maintainer. MLRS Separate Battery Headquarters also are authorized a Unit Clerk and a Medic. MLRS Batteries have no Executive Officer; rather, there is an Operations Officer who also heads the Fire Direction Center. The command element is equipped with three HMMWVs (with AN/VRC-46 or -47 radios).

In addition to the Operations Officer, the Fire Direction Center (FDC) includes a Fire Direction Computer, a Battery Display Operator, five Fire Direction Specialists, and a Radio Operator. The PADS Party is made up of a Section Chief (MOS 82B) and a vehicle driver. The

MLRS Ammunition Platoon

Headquarters Section

Platoon Leader
Platoon Sergeant
Light Vehicle Driver

One HMMWV with AN/VRC-46 radio

Three Ammunition Sections, each with:

Section Leader
Assistant Section Chief
Ten MLRS Ammunition Specialists

Six M985 Heavy Expanded Mobility Tactical Trucks (HEMTTs) with M989 Heavy Expanded Mobility Ammunition Trailers (HEMAT) and AN/VRC-64 radio..

Figure 1. MLRS Ammunition Platoon Organization and Equipment.

FDC is equipped with one M577A2 command post carrier (with four AN/GRC-46 radios and one AN/GRC-106 radio) and one HMMWV (with PADS and an AN/VRC-46 radio).

The Battery Maintenance Section includes the Battery Motor Sergeant and 13 soldiers in MOS 63S, 63B, 63T, 52D, and 76C. The maintenance section is equipped with an M88 tracked recovery vehicle, a HEMTT wrecker, two 2-1/2-ton trucks, a 5-ton truck, and one HMMWV. The wrecker, recovery vehicle, and the HMMWV are equipped with AN/VRC-64 radios.

The Battery Supply Section includes the Battery Supply Sergeant, the unit armorer, two petroleum supply specialists, and three vehicle drivers. The supply section is equipped with one 5-ton fuel tanker, one HEMTT fuel tanker with fuel trailer, a 2-1/2-ton truck, and three HMMWVs.

The Mess Section has five members, led by the Food Service Sergeant and First Cook. The mess section is equipped with one 2-1/2-ton truck.

An MLRS Battery includes six officers and 122 enlisted men in its published Table of Organization.

Higher Echelons

As mentioned earlier, MLRS Batteries are either separate batteries under Division Artillery, or are organized into MLRS Battalions under Corps Artillery. In the separate battery organization, the Battery Commander reports directly to the Division Artillery (DIVARTY) Commander. Staff functions and provided and resources are allocated directly to the MLRS battery from DIVARTY.

In the MLRS Battalion organization, MLRS Batteries are organized under a conventional Battalion organization. The Battalion provides staff functions and allocates resources to the subordinate Batteries.

Differences from Cannon Artillery Units

MLRS Batteries differ in several meaningful ways from conventional cannon artillery Batteries. Most of these differences arise from the rate of fire capability of MLRS and the need for dispersed, mobile employment of MLRS units. First, MLRS Batteries have an organic resupply capability (with the Ammunition Platoon) that is not present in most cannon units. This brings a need for dispersed command and control that is not the case for many cannon units. The advent of the M109A6 howitzer may impose such a requirement for cannon units, since it is believed that this weapon system will have mobile, dispersed tactical doctrine similar to that of MLRS.

Second, MLRS Batteries are organized into Platoons. This differs from the conventional cannon artillery unit organization of six firing sections and no Platoon organization. 155-millimeter self-propelled and 203-millimeter towed cannon units are currently changing their organization to the "3 x 8" organization with a split operations capability. Each cannon Battery under this organization will have two firing Platoons with four howitzer Firing Sections each.

Third, MLRS units require a great deal more space for operations than do conventional cannon units. Each MLRS Platoon doctrinally occupies a three by three kilometer area for firing operations and concealment between fire missions. This differs materially from the compact emplacement of a conventional cannon unit, where the FDC, Battery headquarters, and the guns are located relatively close to one another.

Fourth, MLRS Battery missions differ from those of cannon units. MLRS is typically assigned a General Support mission. As part of this mission, MLRS fires are used against high-value and follow-on echelon targets preferentially, and in a counterbattery role. MLRS units are not normally assigned Direct Support missions. Cannon units are typically assigned Direct Support, General Support, General Support (Reinforcing), and Reinforcing missions, depending on the unit's capabilities and the tactical situation.

Finally, MLRS Battery weapon systems are more technologically sophisticated than those of cannon units. Because of the amount of electronics required to implement the capabilities of MLRS and support its tactical employment, MLRS launchers require different sorts of maintenance and support than do cannon weapon systems. This means that larger numbers of specialized maintainers and different types of skills are required to support MLRS units as compared to cannon units.

History of this Study

This study originated with a requirement to determine the amount of ammunition required annually per MLRS Battery to support training and readiness. Currently, 108 MLRS rounds per Battery are allocated annually to support training (twelve rockets per launcher). This figure is not known to be based on a definitive study of requirements for MLRS live fire in training, however. In light of the apparent lack of empirical support for the 108-rocket annual requirement per battery, the Standards in Training Commission (STRAC) within Headquarters TRADOC requested that the Field Artillery School determine empirically the amount of ammunition actually required annually to support MLRS training.

No information to relate the ammunition requirement to established training and live fire requirements was immediately available. The need for a study to provide such information was thus established. Sponsorship for the study was assigned to the Individual and Unit Training Directorate (IUTD) of the Department of Training Development of the Field Artillery School.

In turn, IUTD requested assistance from the Army Research Institute (ARI) in performing the study. When arrangements for this assistance were complete, ARI and IUTD representatives met on several occasions to define the goals and boundaries of the study. Specific topics of interest, goals, and objectives for the study were identified during these discussions. Once specific goals and objectives were set, resources to perform the study were examined. Neither ARI nor IUTD had available the personnel resources needed to perform the actual study design, conduct, and analysis. A need for contractor support to perform these functions was defined. Arrangements for contractor support were made through an existing ARI agreement with the U.S. Office of Personnel Management. The contractor selected was Applied Science Associates, Inc.

An initial data collection and analysis plan was developed during the first two months of the study period. After review by ARI, this plan was modified, and briefed to IUTD for approval to proceed. Discussions between ARI, IUTD, and the contractor were held to finalize the units to be involved in the study and the time frames for data collection and analysis.

Data were collected by survey, structured interview, and gathering of available documents at five Continental United States (CONUS) Forces Command (FORSCOM) posts where MLRS units are assigned. Personnel at all echelons from MLRS Firing Section through Division Artillery or MLRS Battalion (as appropriate) were interviewed to gather their perspectives on the study topics. Specific targeted surveys to gather data on task proficiency, training resources, and training detractors were distributed and collected from personnel interviewed. Available documentary information on training programs, performance assessment techniques, training resources, unit personnel characteristics, and training guidance was gathered at the sites involved in the study.

The information gathered was reduced and analyzed so as to address the specific topics defined at the beginning of the study. Recommendations and summaries were prepared from the findings. These are presented in this report.

Study Goals

The goals of the study, as defined by ARI and the Field Artillery School, are as follows:

1. Identify the characteristics of training programs currently taking place in MLRS units. Sub-topics of interest include: training content, training methods, frequency of training and relationships to major events or cycles, training guidance, and training planning and scheduling.

2. Identify the techniques and methods used by units and unit personnel to assess individual and collective performance, and identify the value, advantages and disadvantages of these methods.

3. Identify the training resources required to conduct effective training for MLRS units. Also, identify reported shortfalls and inadequacies in training resources, and assess the effects of these conditions on training quality and the ability to train.

4. Identify training problems and issues reported by MLRS units, and gather suggestions for dealing with the identified problems and issues.

5. Relate training program characteristics, resource needs and shortfalls, and reported training issues and problems to unit performance proficiency.

To meet these goals, it was determined that as large as possible a sample of MLRS units within the Continental United States (CONUS) would be included in the study.

Report Overview

The remainder of this report is divided into three sections and several Appendices. Section Two describes the methods used to conduct the study, and presents information about the characteristics and membership of the units that participated in the study.

Section Three presents the results and conclusions drawn from the information gathered in the study.

Section Four provides recommendations for improving MLRS training.

Appendix A provides copies of the data collection protocols used to gather data from MLRS units. Appendix B summarizes the characteristics of personnel interviewed at each unit. Appendix C describes the tasks at Battery, Platoon, and Section echelons that were used to develop performance proficiency ratings for the involved units. Appendix D describes the overall responses to interview questions from the units involved in the study. Appendix E contains findings specific to each of the units that were surveyed as part of the study, supplementing the results presented in Section Three.

SECTION TWO

METHODS

Fulfilling the goals of this study required that specific information be obtained from each MLRS unit that participated in the study. In order to gather this information, the precise nature of questions to be addressed, as well as the specific sources that would be contacted to obtain the data, had to be specified. This was one goal of the preparation phase of the study.

Before identifying data items and sources for needed information, detailed knowledge of the characteristics of the MLRS system and of the makeup of MLRS units was needed. This knowledge was gained in two ways. First, investigators studied MLRS equipment, doctrinal, and technical publications with the goals of the study in mind. This provided some of the needed background to design the study. This was supplemented by a three-day briefing provided by the Field Artillery School Gunnery Department (MLRS Branch). This briefing covered practically every aspect of MLRS operations and training and provided valuable context for both designing the study and evaluating the information obtained as a result of the study.

After familiarization was complete, the next step was to specifically identify the information to be gathered during the study. Using the study goals as a point of departure, a specific list of topics and subtopics to be addressed in data gathering was prepared. These were reviewed by both ARI and the Field Artillery School and revised based on their inputs. The list of topics and subtopics that resulted is presented in Table 1.

Next, the most appropriate sources of information to address each topic and subtopic were identified. It was taken as an assumption that most information would be gathered directly from unit members, and that relatively little unit-to-unit consistent documentary information would be available. Specific personnel positions within MLRS and higher-echelon units were identified to provide information on each topic and subtopic. Since it was desired to examine MLRS training from the perspectives of all organizational echelons, it was often the case that the same topic and subtopic was addressed at more than one echelon. ARI and Field Artillery School review and revision also took place with respect to data source selections. Figure 2 shows a matrix of positions by topic and subtopic addressed.

After topics and sources were finalized, data collection approaches were selected for each combination of source and topic. it was desired to collect as much standardized documentary information as possible from the participating units. However, it was not possible to identify in advance what document-based information might be available at each unit site, so it was necessary to plan other approaches to gather the needed information. The information gathered by these means would be supplemented with document-based data whenever possible.

Two basic approaches, in addition to gathering document-based data, were selected—structured interviews and hand-out surveys to be administered during the interviews. The hand-out surveys solicited interviewees' input on the proficiency of their unit on a number of collective tasks, and on the availability of training resources and the occurrence of various training detractors.

Table 1

Topics and Sub-topics for MLRS Training Study

- Current Training Programs
  - Training Contents
  - Training Methods
  - Training Frequencies
  - Training Roadmaps
  - Training Events
  - Training Sequence and Hierarchy
  - Training Guidance
  - Training Strategies, Methods, and Techniques
  - Training Scheduling
  - Personnel Involved in Training
- Individual and Unit Performance
- Performance Evaluation Techniques
- Training Resources
  - Availability/Adequacy
  - Utilization
- Critical Training Issues and Problems
- Conditions Affecting Training, Training Management, and Performance
  - Stability (Turnover and Turbulence)
  - Personnel Fill
  - Job/MOS/Grade Match
  - Personnel Quality
    - Aptitude
    - Experience
    - Skills
  - Training Detractors
- Satisfaction with TRADOC Training Support Products
  - School Graduates
  - ARTEP MTP
  - Training Support Products
  - New Products needed

Structured interview guides were prepared for each echelon (Battery, Firing Platoon, Ammunition Platoon, Firing Section, and Ammunition Section) within MLRS Batteries. Interview guides were also prepared for Commanders, Executive Officers, and the S-1, S-3, and S-4 of the Batteries' parent units (MLRS Battalions or Division Artillery, depending on the site). These guides were reviewed by ARI and the Field Artillery School and revised as necessary. The interview guides that were used during data collection are included in Appendix A.

Hand-out surveys were also prepared, reviewed, and revised. The same surveys (one-page matrices) for training resource availability and the occurrence of training detractors were used at all echelons. Unit task proficiency surveys differed from echelon to echelon, since different specific collective tasks are performed by each echelon. Two perspectives on unit task proficiency were sought at each echelon—a self-rating by the senior personnel at that echelon, and an assessment of the echelon by senior personnel at the next highest echelon. This means that Battery performance was addressed by Battery Commanders and Operations Officers, as well as by the Commander or S-3 of the parent echelon, on a task-by-task basis; Platoon performance was assessed by the Platoon Leader and Platoon Sergeant as well as the Battery Commander or Training Officer, etc. The specific tasks included on each survey were selected by the Field Artillery School and ARI, based on an assessment of which tasks were most critical to unit combat performance. The surveys used in data collection are included in Appendix A.

The specific documents to be gathered during visits to units were not specified in advance. Rather, a list of topics on which it was believed document-based data would be available was taken to each site. Appropriate personnel in each MLRS unit were contacted during site visits, and requests made for documents that could fulfill the stated data needs.

Next, data reduction and analysis procedures were designed. Since it was expected that much of the information would come from the structured interviews, an overall content analysis approach was selected for data analysis. In this approach, each interview's content (as recorded on audio tape and in interviewers' hand-written notes) is reviewed, and topic-specific statements are derived from the questions asked and the answers provided. In turn, these statements are categorized according to the topic addressed, and entered into a computer database. When this process is completed for all interviews, the data are extracted from the database grouped by topic, site, and echelon, and possibly other groupings or subgroupings as well. The specific topics used for categorizing interview statements in the database in this study are shown in Table 2. Some of these topics were later combined when statement data was retrieved from the database for analysis.

The grouped statements, as well as any other available information that bears on the topic of interest, are then reviewed, to extract the common and unique themes contained in the information grouping. These themes form the basis for evaluating both the prevalence of mention of items on particular topics, as well as the diversity of comments on a particular topic. Together, they allow conclusions to be drawn about agreement, disagreement, and consistency of the information provided in the interviews.

Information from the hand-out surveys was reduced so as to be useful to supplement information from the interviews, as well as to compare with interview content on proficiency and training resources and detractors issues. Proficiency data were summarized by assigning a score from 1 (poorest proficiency) to 5 (best proficiency) to the rating provided by each respondent on each task. The scores were then combined and averaged to give a composite proficiency score for each echelon element (Battery, Platoon, Section) in three task areas: operations, logistics, and Nuclear, Biological,

and Chemical (NBC) tasks. The relationships between these categories and specific tasks at each echelon are shown in Appendix C. This resulted in two sets of scores for each echelon element—one from the echelon self-assessment, and the other from the next highest echelon. The score in each area can range from 1 to 5, with the numbers having same meanings as stated above.

		DIVARTY or Battalion				MLRS Battery		
TOPICS	SUB-TOPICS	CO/XO	S-1	S-3	S-4	Battery	Platoon	Section
Current Training Programs	Training Contents, Methods, Formats, Frequencies, Roadmaps, Schedules							
	• Training Events	•		•		•		
	• Training Sequence and Hierarchy					•	•	•
	• Training Guidance	•		•		•		
	• Training Strategies, Methods, Techniques			•		•	•	•
	• Training Scheduling			•		•		
	• Personnel Involved			•		•		
	Individual and Unit Performance			•		•	•	•
	Performance Evaluation Techniques			•		•	•	
	Training Resources							
	• Availability/Adequacy	•		•	•	•	•	•
	• Utilization				•	•	•	
	Critical Training Issues and Problems	•		•		•	•	•
Conditions Affecting Training, Training Management, and Performance	Stability (Turnover and Turbulence)		•			•		
	Personnel Fill		•			•		
	Job/MOS/Grade Match		•					
	Personnel Quality (Aptitude, Experience, Skills)		•					
	Training Detractors			•		•	•	•
Satisfaction with TRADOC Training Support Products	School Graduates	•				•		•
	ARTEP MTP					•	•	
	Training Support Products			•		•	•	•
	New Products Needed	•		•		•	•	•

Figure 2. Topics and Sub-topics to be Addressed by Organizational Position of Personnel.

Ratings from the training resources and training detractors questionnaires were tabulated and summarized. These summaries were used to develop tables indicating which resources were found to be lacking more than 50 percent of the time, and which training detractors were encountered more than 50 percent of the time, by interview site. These tables are presented in the next section of this report.

Table 2

Categories and Categorization Codes for MLRS Training Study Database Entry and Retrieval

Coding			Category Title
1	1		Contents and Frequencies of Training
1	2		Training Strategies, Methods, and Techniques
1	4		Training Roadmaps, Sequence, and Hierarchy
1	5		Training Events
1	7		Training Guidance
1	9		Training Scheduling
1	10		Personnel Involved in Training
1	11		Actual Time Spent Training
1	12		Training Costs
2			Individual and Unit Performance
3			Performance Evaluation Techniques - General
3	1		Performance Evaluation Techniques - Type
3	2		Performance Evaluation Techniques - Frequency and Scope
4	1		Training Resources - Availability and Adequacy
4	2		Training Resources - Utilization
5			Critical Training Issues and Problems
6			Conditions Affecting Training and Performance - General
6	1		Conditions - Stability
6	2		Conditions - Personnel Fill
6	3		Conditions - Job/MOS/Grade Match
6	4	1	Personnel Quality - Aptitude
6	4	2	Personnel Quality - Experience
6	4	3	Personnel Quality - Skills
6	5		Training Detractors - General
6	5	1	Detractors - Equipment Reliability
6	5	2	Detractors - Maintenance S8
6	5	3	Detractors - Maintenance 27M
6	5	4	Detractors - Outside Requirements
6	5	5	Detractors - Repair Parts Availability
6	5	6	Detractors - Repair Costs
6	5	7	Detractors - Maintenance 63T
7			TRADOC Training Support Products - General
7	1		TRADOC Training Support Products - School Graduates
7	2		TRADOC Training Support Products - ARTEP MTP
7	3		TRADOC Training Support Products - Other/New Products
7	4		Training Support Products - Other
8			Command Support

Data available in documents provided by the units visited were summarized by reviewing all the documents available for a site with the list of topics and subtopics in mind. When data that were pertinent to a particular topic or subtopic were identified, these data were summarized to capture the essence and content of the information available. For example, unit manning reports were available from each unit. These were reviewed to identify the matches between the characteristics (grade, MOS) of incumbents of each position in the unit and the characteristics authorized in the unit Table of Organization and Equipment (TOE). This process enabled identifying cases where units were understrength, people were doing jobs authorized for personnel of different qualifications, etc.

After all preparations were complete, the specific units, sites, and dates to be visited were determined. It had been anticipated that an accelerated data collection schedule, beginning in January 1990 and extending no later than April, could be undertaken. However, it was not possible to make the arrangements that would have made this schedule possible. Data collection was conducted in accordance with planned "Umbrella Weeks" for sites with MLRS units during the period January through June 1990. The Field Artillery School and ARI jointly determined that these units would provide a representative sample of MLRS units in the CONUS, although a more inclusive sample had originally been desired.

Data Collection

The five sites and units visited and the dates of each visit are summarized in Table 3. During the visits, 98 interviews were conducted, including a total of 225 unit personnel. All interviews at echelons above Battery were conducted as individual interviews with the respondent. Most of the remaining interviews were conducted as group interviews with two or more interviewees and two or more interviewers. The largest number of personnel interviewed in a group was seven. Either two or three contractor staff members participated in each data collection trip. They were accompanied on each trip by the ARI Technical Monitor and, on two occasions, by ARI military personnel.

Where there were more than two interviewers present at an interview, one interviewer conducted the interview according to the appropriate structured interview protocol, and distributed and collected the hand-out questionnaires. The other interviewers acted as recorders, both audio-taping the interview session and taking handwritten notes. Both the interviewer and the recorders could pose follow-up or additional questions over and above those to be covered by the interview protocol. Complete details describing the interviews conducted and the participants in each interview by duty position is presented in Appendix B.

The positions held by personnel interviewed at each site are summarized in Table 4. Tables 5 and 6 summarize the grades of personnel interviewed and their previous experience in MLRS units. These Tables reflect that the interview sampling goals of the study were attained: personnel at all echelons were interviewed, and a broad spectrum of perspectives on MLRS training was obtained.

At each site, an attempt was made to interview personnel from the echelon above Battery before interviewing any Battery personnel. This was done to maximize the amount of time available to gather document-based information on unit personnel, training programs, training resources, and training guidance, which were generally provided by the higher echelon organizations.

Table 3

Unit Types, Sites, and Dates of Data Collection Visits

Unit Type	Site Code	Visit Dates*
MLRS Battalion	Site 1	25 - 30 January
MLRS Battalion	Site 2	31 January - 2 February
MLRS Separate Battery	Site 3	19 - 21 March
MLRS Separate Battery	Site 4	14 - 17 May
MLRS Separate Battery	Site 5	4 - 7 June

* All dates Calendar Year 1990

A variety of document-based information was obtained at each site. Most sites provided examples of training guidance provided by various echelons, from Corps and Division commanders down. Each site provided information on current unit personnel that enabled assessing critical issues of personnel availability, stability, and quality. All sites provided some documentary information on training resources and resource costs, as well as examples of training plans and training content. In several cases, copies of locally-developed Standard Operating Procedures, certification criteria and procedures, Section-level Battle Drills, and evaluation criteria for various tasks were provided. All sites provided some documentary information about personnel quality, usually in the form of Skill Qualification Test (SQT) score or Common Task Test (CTT) score summaries for unit personnel. In one case, Armed Services Vocational Aptitude Battery (ASVAB) scores for unit members from one MOS were provided.

While there was no particular consistency between the document-based data obtained at each site, the documents from each site enabled addressing the issues that had been planned to be addressed based on these data. Factual information was extracted and summarized from the documents according to the topics and subtopics that could be addressed by the information.

Table 4

Positions Held by Personnel Interviewed in the Study

Position Held	MLRS Battalions		MLRS Separate Batteries		
	Site 1	Site 2	Site 3	Site 4	Site 5
Commander, Echelon Above Battery[1]	1	1	1	1	1
Executive Officer, Echelon Above Battery	–	1	–	–	–
S-1, Echelon Above Battery	1	1	1	1	1
S-3, Echelon Above Battery	1	1	1	1	1
S-4, Echelon Above Battery	1	1	1	1	1
Training NCO, Echelon Above Battery	–	–	1	–	–
PAC, Echelon Above Battery	–	–	1	–	–
Battery Commander	3	3	2	1	1
Battery Operations Officer	3	3	–	1	–
Battery First Sergeant	3	2	–	–	–
Battery Communications Chief NCO	1	–	–	–	–
Battery Operations Sergeant	1	–	–	–	–
Battery Reconnaissance Sergeant	1	2	–	–	–
Firing Platoon Leader	2	5	3	2	2
Firing Platoon Sergeant	8	7	3	3	3
Ammunition Platoon Leader	1	2	–	1	–
Ammunition Platoon Sergeant	2	3	1	1	1
Firing Section Chief	19	12	9	9	9
Ammunition Section Chief	7	7	–	3	2
Gunner	16	6	7	3	5
Assistant Chief, Ammunition Section	2	–	–	1	2
Driver	1	3	–	2	–
Totals	74	60	31	31	29

[1] Echelon Above Battery is MLRS Battalion for Sites 1 and 2; DIVARTY for Sites 3, 4, and 5.

Table 5

Military Grades of Personnel Interviewed in the Study (by Site)

Grades	MLRS Battalions		MLRS Separate Batteries		
	Site 1	Site 2	Site 3	Site 4	Site 5
Private — Specialist 4th Class	3	9	8	4	3
Sergeant	26	17	3	5	8
Staff Sergeant	23	9	8	10	8
Sergeant First Class	7	6	3	3	3
Master Sergeant	3	2	–	–	–
Second Lieutenant	–	3	1	–	2
First Lieutenant	7	6	2	4	–
Captain	3	5	3	3	2
Major	1	2	2	–	2
Lieutenant Colonel	1	1	–	1	–
Colonel	–	–	1	1	1
Totals	74	60	31	31	29

Table 6

Previous MLRS Experience of Personnel Interviewed in the Study (by Site)

MLRS Experience	MLRS Battalions		MLRS Separate Batteries		
	Site 1	Site 2	Site 3	Site 4	Site 5
Held at least one position in an MLRS unit previous to assuming current position	67	45	22	27	22
Never assigned to an MLRS unit prior to assuming current position	6	4	6	3	7
Information not available	1	11	3	1	–
Totals	74	60	31	31	29

Data Reduction

After each site visit, reduction of the information gathered at the site began. The procedures described above for data reduction were, in general, followed closely. Interview statement data were at first transcribed using word processing software; later, transcribed statements were entered directly into a database management system. Each transcribed statement was coded to indicate its source, and up to three categorization codes were assigned to each statement. The interviews resulted in 1,541 separate statements, an average of nearly 16 statements per interview. On average, 1.5 categorization codes were assigned to each statement. In combination with the statement content, this indicates that thoughtful, complex responses were given to questions on many topics.

After statement transcription, coding, and database entry were complete, the database was used to develop aggregated groups of statements on the topics and subtopics of interest to this study. Separate groupings were generated for each topic, site, and echelon, for a total of 740 queries of the database. Many of these queries yielded no statements; most yielded at least a few. A summary of the number of statements retrieved by category, site, and echelon is presented in Appendix D. Query printouts identified the site, classification category, and echelon perspective of the statements. For each statement, the personnel involved in the interview from which the statement was developed were identified, in addition to printing the textual content of the transcribed statement.

For each topic and subtopic to be analyzed, all pertinent information was assembled, regardless of source. The content analysis process described above was performed to extract common and unique theme statements and supporting factual evidence on the topic or subtopic. These theme statements formed the basis for the conclusions in the next section.

Individual-site and aggregated analyses of the data were then performed. The results and conclusions from the analysis process are presented in the following section of the report.

SECTION THREE

RESULTS AND CONCLUSIONS

The results presented in this section are presented so as to maintain general consistency with the Training Management Cycle described in Field Manual (FM) 25-100, *Training the Force* (Figure 1-5, page 1-9). This cycle emphasizes the need for iterative training planning based on battle focus and wartime missions, execution of training, and assessment of performance to define needs for further training. Identified training needs are addressed in subsequent training cycles. Training in this manner supports the dictum "Train as You Will Fight."

To conform with this general organization, the first part of this section presents findings regarding MLRS training under three subheadings:

1. Training Guidance and Planning;
2. Training Conduct and Evaluation; and
3. Individual and Unit Performance.

Following these presentations, training issues and problems that were identified in the information collected are presented and discussed. A brief summary of results is then provided, followed by statements of conclusions drawn from the results. Supplementary information on the specifics of a number of topics addressed in the study is provided in Appendix E, for reference. The material in this Appendix concerns "eaches" with respect to specific units visited during the study. This section concentrates on integration and comparison of results across all units visited.

Information presented in this section is accompanied by indications of the sources from which the information is drawn. Where interviews were the sources of information, a number prefaced with the letter "I" (*e.g.*, I01) is used to identify the specific interview(s) in which information was provided. A summary of the interviews and personnel involved is found in Appendix B. Tabular summaries are used throughout to provide comprehensive presentations of the results obtained.

Training Guidance and Planning

The Training Management Cycle in FM 25-100 begins with definition of what is to be trained. This definition focuses on identification of units' wartime missions and the tasks that must be performed to accomplished those missions. The mission and task definition process begins at the highest echelons, with identified tasks at higher echelons used as a basis for identifying critical tasks at lower echelons. The identified tasks are collectively referred to as the Mission Essential Task List (METL) for the echelon in question. Once the METL and critical tasks are established at an echelon, they provide a basis for planning training, along with information about the current performance capabilities of units at each echelon.

Training planning is addressed from three perspectives: long-range, short-range, and near-term. Long-range planning focuses at the Major Command (MACOM) and Corps levels, projects training for at least one year, and is primarily concerned with scheduling projected major training events (*i.e.*, Combat Training Center [CTC] rotations), allocating long-lead-time resources (CTC or other major training area planning), and developing planning and budgetary guidance for dissemination to both higher headquarters and subordinate units. Command Training Guidance (CTG), long-range planning calendars, and training time management allocations[1] are major products of long-range training guidance.

Short-range training planning focuses at Division through Battalion levels, extends at least three months into the future, and provides a basis for preparing near-term training plans. The short-range plan expands on particular aspects of the long-range plan deemed to be of critical importance, establishes training objectives to be met in specific training events, allocates short-leadtime resources (*i.e.*, Local Training Areas, ranges, etc.), and coordinates other resources necessary to carry out training. Short-range planning results in short-term quarterly training guidance to subordinate units, publication of the short-term training calendar, refined plans for conduct of training events, and training resource allocations to subordinate organizations.

Near-term training planning focuses at Battalion and subordinate levels, covers a six- to eight-week period, and culminates with publication of the training schedule. This planning encompasses sequencing training for METL and associated tasks, scheduling and execution of the training objectives established in short-range plans, final resource coordination, providing specific guidance to trainers, and coordination with other units as required. A key element of near-term training planning is the conduct of training meetings at Battalion, Company, and Platoon levels. Training meetings at the Company/Battery and Platoon levels establish a bottom-up flow of information about specific training needs and how these needs will be satisfied.

Training Guidance

The MLRS Batteries surveyed in this study ideally should receive guidance of several sorts resulting from the training planning process, as described. These include:

1. Higher-echelon METL supporting development of unit METL and identification of critical tasks for subordinate units.

2. Guidance for participation in large-scale training events.

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[1] Training time management is frequently described by the Green-Amber-Red system. Each color name is shorthand for a level of training emphasis and capability, and training resource priority. Units in Green periods are assigned the highest priority for training resources, and minimize administrative and support requirements to enable the primary focus of activity to be on training. Large-scale multi-echelon collective training events are generally possible for units only during Green periods. Units in Amber periods receive a lower priority for training resources, and selected personnel are diverted to satisfy administrative and support requirements when necessary. The training emphasis for units in Amber is on small unit, crew, and individual training; subordinate organizations are occasionally able to conduct collective training. Units in Red periods provide resources for support missions and administrative functions while taking advantage of all opportunities for individual, leader, and crew training. Collective training is generally not possible for units in Red periods.

3. Training time management allocations providing adequate time and resource priority to train to standards.

4. Allocation to units of resources required to train to standards.

5. Higher echelon command training emphasis.

6. Specific guidance for MLRS Batteries' training, including training objectives.

The information gathered allows some examination of the guidance provided in each of these areas. Sources for this information included annual and quarterly Command Training Guidance from higher echelons, short-range planning calendars, near-term training schedules, and remarks provided in numerous interviews. Whether guidance was provided in each of the six categories listed above was included in the information gathered is identified for each MLRS Battery in Table 7. The following paragraphs discuss the guidance provided.

MLRS-specific METL. Higher echelon METL was provided to all MLRS Batteries as part of training guidance. MLRS-specific Battalion METL was provided to the six Batteries organized under MLRS Battalions. The METL provided to MLRS separate Batteries was more general in nature, and concerned with DIVARTY-echelon tasks. Therefore, it is necessary for MLRS Separate Batteries to develop their own METL within the broad guidelines of DIVARTY METL.

Large-scale Training Events. No guidance to any MLRS unit was identified for participation in large-scale training events such as CTC rotations, REFORGER, or other major training events. Neither was guidance for participation in large-scale home-station training with maneuver units identified from the information available. One MLRS Separate Battery (Site 3) reported participating in rotations to the National Training Center (NTC), but evidently was not involved with maneuver units in preparation for that event in any significant way. One MLRS Battalion reported planning for and participation in several Command Post Exercises (CPXs) involving higher echelons. Available information suggests that these exercises were limited to Field Artillery units.

Training Time Management. For MLRS Separate Batteries, this type of guidance was provided in terms of identifying scheduled time for training areas and ranges for MLRS units, on short-term planning calendars. MLRS Battalions provided similar time management guidance to their subordinate Batteries. A frequent comment in interviews was that MLRS units typically receive low priority in allocation of critical training resources such as training areas and ranges, as compared to maneuver units ("Forever Amber"). One factor cited as contributing to this situation is that maneuver units are frequently engaged in preparation for major training events. As cited, the MLRS units surveyed do not as a rule take part in such events. Also, changes to scheduled training resulting from taskings by higher echelons were cited as frequently disrupting the conduct of training. This particular issue is dealt with in more detail in a subsequent subsection.

Resource Allocations. The information gathered indicates that MLRS units, particularly Separate Batteries, are allocated training resources by higher echelon headquarters. MLRS units provide input to higher echelons indicating their training needs, but it is not clear that this input influences the units' priority for resources in the allocation process. No evidence or reports of significant participation by MLRS units in resource coordination (in the near-term training planning process) were found.

Table 7

Contents of Training Guidance Provided to MLRS Batteries by Higher Echelons

Training Guidance Contents[1]	Batteries within MLRS Battalions						MLRS Separate Batteries		
	A	B	C	D	E	F	G	H	I
METL Specific to MLRS	●	●	●	●	●	●			
Guidance for Participation in Large-Scale Training Events									
Training Time Management (Training Cycles)				●	●	●	●	●	●
Resource Allocations (Ranges, Training Areas, etc.)	●	●	●	●	●	●	●	●	●
Command Training Emphasis	●	●	●	●	●	●	●	●	●
Specific Guidance for MLRS Batteries	●	●	●	●	●	●			

[1] Sources for this information include Annual and Quarterly training guidance documents provided to MLRS Batteries by higher echelon commanders.

Command Training Emphasis and Specific Guidance for MLRS Batteries. These components of Command Training Guidance to units should include specification of objectives to be met by training and their relationships to training events, assessment of METL proficiency, training priorities, and numerous related issues. Of interest in this study is the level of guidance provided to MLRS Batteries by higher commanders. In MLRS Battalions, detailed and specific guidance from Battalion was typically provided as part of Yearly and Quarterly Training Guidance (YTG and QTG). While individual Batteries were not given differential emphasis in Battalion guidance, the elements of guidance and level of detail that would be expected from the training planning process described in FM 25-100 were included in Battalion guidance. This was not the case for MLRS Separate Batteries, however. DIVARTY YTG and QTG documents reviewed included only the designation of resources (training areas and ranges) for the MLRS Separate Batteries and, in one case, scheduling of time for an MLRS Battery external evaluation. In general, DIVARTY guidance did not include even mention of the MLRS unit except as a line on training calendars.

Comments made during interviews suggest that one reason for the less detailed and specific command guidance provided to MLRS Separate Batteries (as compared to Batteries in MLRS Battalions) is that there exists relatively little understanding and appreciation of the capabilities, limitations, and needs (particularly with respect to training) of MLRS Batteries on the part of DIVARTY commanders and staff members. MLRS Separate Battery Commanders are organizationally distant from the DIVARTY level, in that there are no intermediate MLRS echelons present in the DIVARTY organizational structure. Also, DIVARTY Commanders and some key staff members have had little or no prior experience dealing with or serving in MLRS-equipped units. This suggests that there is less than optimum appreciation for the situation and requirements of the MLRS Separate Battery on the part of DIVARTY.

In contrast, MLRS Batteries organized in Battalions have access to the resources, knowledge, and experience of Battery commanders and staff who generally have prior experience with MLRS. Guidance to the Batteries is therefore more specific and better articulated with higher-echelon missions and METL. The MLRS Battalions surveyed, however, cannot be compared directly to the Separate Batteries, since they have substantially different missions.

In summary, training guidance from higher echelons to MLRS Separate Batteries is best described as general in nature and sparse, consisting primarily of training resource allocations and encouragement to train. Command training guidance to MLRS Batteries organized in MLRS Battalions is more detailed, focused, and comprehensive. However, it should be noted that none of the guidance provided was reported to have resulted in the establishment of training "roadmaps" or suggestions for the most effective sequencing, strategies, or modes of training for MLRS units.

Training Planned by MLRS Units

Detailed training plans for the units surveyed were not generally available for examination. The information reported here is derived largely from comments made during interviews. A summary of the information available on collective (as contrasted to individual) training planned in the units surveyed is presented in Table 8. This information reflects planned training by the highest echelons trained: above-Battery level field training, Battery-level field training, field training below Battery level, and other collective training.

Table 8

Characteristics of Training Planned by MLRS Units

Types of Training Planned	MLRS Battalions		MLRS Separate Batteries		
	Site 1	Site 2	Site 3	Site 4	Site 5
Field Training Above Battery Echelon	Battalion FTX once per quarter, one week in duration (Source: I01)	Battalion FTXs are planned (frequency and duration not determined; Source: I24)	Two platoons plus slice support were planned to accompany other Divisional units on rotations to the NTC (Source: I39)	None reported.	None reported.
Battery Echelon Field Training	Combined LFX/FTX for each Battery once per quarter, three days in duration (Source: I01)	Goal is to get each Battery to the field 5 - 7 times per year, for about a week at a time (Source: I24)	None reported.	Battery FTXs are scheduled approximately once a quarter, for about three days' duration (Source: I57)	A one-week Battery FTX followed by a one-week LFX is scheduled once per quarter (Sources: I81, I83, training calendars)
Field Training Below Battery Echelon	None reported.	None reported.	None reported.	Platoon FTXs of one day's duration are scheduled about once a month (Sources: I62, training calendars)	None reported.
Other Collective Training	Sergeant's Time (Section Level collective training) scheduled each Wednesday for 6.5 hours in all Batteries (when in garrison; Sources: I01, training calendars)	Sergeant's Time (Section Level collective training) scheduled each Wednesday in two of three Batteries (when in garrison; Sources: I27, I29)	Sergeant's Time (Section Level collective training) scheduled each Thursday morning when in garrison (Sources: I44, training calendars)	No specific block of time is set aside for Section-level collective training, but such training takes place frequently (Source: I61)	Sergeant's Time (Section Level collective training) scheduled each Thursday when in garrison (Sources: I44, training calendars)

Field Training Above Battery Level. Each of the MLRS Battalions surveyed reported planning Battalion Field Training Exercises (FTXs). The Battalion at Site 1 reported that a one-week Battalion FTX is planned quarterly. The Battalion at Site 2 did not report the planned frequency or duration of their Battalion FTXs.

Among the MLRS Separate Batteries surveyed, only one had planned involvement in training above Battery level in the year prior to the site visits. This was the Battery at Site 3, which was involved in two rotations to the NTC. This Battery sent one Platoon on each of two NTC rotations with maneuver units, along with some Battery slice support (details of which were not given).

Battery Level Field Training. Both MLRS Battalions and Separate Batteries reported scheduling Battery-level FTXs approximately once per quarter for each Battery. The exception to this was the MLRS Separate Battery at Site 3, which reported scheduling no Battery-level field training in the previous year. Duration of scheduled Battery FTXs varied from three days to a week in the field. Most of the units reported that they coordinate live firing scheduling with Battery FTXs, either as a part of quarterly Battery FTXs or immediately preceding or following the FTXs. One of the MLRS Battalions (Site 2) reported efforts to schedule the Battalion Tactical Operations Center (TOC) to go to the field when Battery FTXs were scheduled, to provide appropriate command and control support for Battery training.

Field Training Below Battery Echelon. Little evidence of planning field training below Battery echelon was found for any of the units surveyed. The exception here is the Separate Battery at Site 4, which scheduled one-day Platoon field exercises for its Platoons about once a month, for part of the period of interest. A change in command for this Battery resulted in a change in training scheduling; Battery-level field training supplanted the Platoon exercises that were conducted under the previous commander.

Comments were made during interviews suggesting that some Platoon and Section training takes place in local training areas adjacent to motor pools or other garrison areas. No evidence of formal scheduling or resourcing of this training was found, however.

Other Collective Training. In both MLRS Battalions and two of the three Separate Batteries, specific time is planned in weekly training schedules for Section-level collective training, or Sergeant's Time. The amount of time set aside ranges from nearly a full training day (Site 1) down to two and one-half hours (Site 5). Site 4, where the MLRS Separate Battery did not dedicate specific time for Section-level collective training, did however report that some Section-level training takes place in the motor pool most days. Most such training is planned to take place in the motor pool, although some reports indicate that local training areas adjacent to the motor pool, and driver training areas, are often utilized during such training.

In summary, Battalion and Battery field training exercises are generally planned quarterly, for three days to a week at a time. Live fire training is coordinated with Battery FTXs and generally scheduled in the same or an adjacent block of time. Field training below Battery echelon is not formally scheduled or specifically resourced. And, time is set aside in most units for Section-level collective training.

Training Conduct and Evaluation

FM 25-100 stresses the following characteristics of good training:

1. Adequate preparation;
2. Effective presentation and practice; and
3. Thorough evaluation.

In this subsection, information about the preparation of trainers and what training was actually conducted by the MLRS units surveyed is presented. It was not possible to collect sufficient documentary data to build a comprehensive and detailed training profile of each of the units. Enough documentary data were gathered so that, combined with information from interviews, major characteristics of the training that was conducted can be identified.

Also in this subsection is a discussion of evaluation methods used by units for assessing individual and collective task performance.

Preparation of Trainers

Training responsibility is typically highly decentralized, with Section Chiefs and Platoon Sergeants serving as the primary trainers for their elements. Commanders of at least two of the units surveyed stated that this is both desirable, given the decentralized nature of MLRS employment and the level of autonomy and responsibility of Section Chiefs, and consonant with FM 25-100. No formal program to prepare personnel responsible for training for their roles as trainers was reported at any site. Interview comments indicate that there is need for such training in at least one of the units surveyed. Comments in interviews at all five sites indicated that soldiers perceive that Section-level tasks, both for Firing Sections and Ammunition Sections, are not difficult to learn or to perform, however.

Training Conducted

Tables 9 and 10 summarize the field training that was identified as having been conducted by each of the units visited during the 12 months prior to site visits. Table 9 summarizes training conducted by MLRS Battalions; Table 10 does the same for MLRS Separate Batteries. Each of these Tables addresses several major aspects of field training. Both tables present information on field training at Battery and lower echelons, and unit participation in major training events. Table 9 presents information on Battalion-level training, as well. Table 11 presents a summary of a typical week of garrison training for units at each of the five sites, highlighting Section-level training conducted in garrison. It is almost certainly the case that training in addition to that reported here was conducted by some of the units, but insufficient documentary information was available to identify it. The following paragraphs discuss the summaries presented in the Tables.

Table 9

Training Conducted by MLRS Battalions During the 12 Months Prior to Site Visits

Characteristic of Training	Battalion at Site 1	Battalion at Site 2
Battalion-level Field Training	2 Battalion FTXs conducted (9/89 and 1/90; Source: I01). Battalion CPX conducted (no date; Source: I01).	4 Battalion FTXs conducted (1/89, 2/89, 4/89, 1/90; Source: I24). 2 Battalion CPXs conducted (no dates; Source: I24). Participated in DEPEX (5/89; Source: I24).
Battery-level Field Training	Each Battery has a 3-day combined LFX/FTX quarterly. First day is live fire, followed by Battery- and lower-echelon training at Battery Commander's discretion (Source: I03). Live fire is balanced across Platoons and Sections; goal is for each Section to fire three different one-rocket missions each quarter (Source: I15).	Battery FTXs conducted 7/89, 8/89, 9/89, 10/89, 12/89; Source: I24). Batteries go to the field about once a month for about 5 days at a time (Sources: I26, I27, I28, I31, I32, I33). Live fire is conducted during quarterly Battery FTXs (Source: I29). The goal is to have each Section shoot three different one-rocket missions each quarter (Source: I21).
Lower-echelon Field Training	None reported.	Occasional 1-day Platoon STXs are conducted (Source: I27).
Major Training Events (CTC, JTX, REFORGER, etc.)	None.	None.

Table 10

Training Conducted by MLRS Separate Batteries During the 12 Months Prior to Site Visits

Characteristic of Training	Battery at Site 3	Battery at Site 4	Battery at Site 5
Battery-level Field Training	None (Source: I45, I52, I53)	Battery FTXs conducted 9/89, 10/89 (Source: Training Calendars) Battery LFXs conducted 7/89, 9/89, 10/89 (Source: Training Calendars)	Battery conducts a quarterly combined LFX/FTX, two weeks in duration (Sources: I81, I83) Live fire is not equally distributed across Platoons and Sections because of the presence of inexperienced people who are not certified to live fire (Source: I81).
Lower-echelon Field Training	One Platoon participated in an FCX and conducted one Platoon FTX or STX (Source: I54) Platoons live fire about three times per year (Source: I54).	13 Platoon FTXs conducted during the period 5/89 - 10/89 (Source: Training Calendars)	None reported.
Major Training Events (CTC, JTX, REFORGER, etc.)	Two Platoons participated in NTC rotations with maneuver elements (Sources: I39, I45, I47, I52)	None conducted. (Source: I61)	None conducted. (Source: I83)

Table 11

Representative Weekly Events of Garrison Training Conducted by MLRS Units[1]

Day of Week	MLRS Battalions		MLRS Separate Batteries		
	Site 1	Site 2	Site 3	Site 4	Site 5
Monday	Command maintenance (PMCS, scheduled maintenance)	Vehicle maintenance (PMCS, scheduled maintenance)	Command maintenance (PMCS, scheduled maintenance)	Individual task training as scheduled by Battery (unless external taskings intervene)	Individual task training as scheduled by Battery (unless external taskings intervene)
Tuesday	Individual task training as scheduled by Battery (unless external taskings intervene)	Individual task training as scheduled by Battery (unless external taskings intervene)	Individual task training as scheduled by Battery (unless external taskings intervene)	Command maintenance (PMCS, scheduled maintenance)	Command maintenance (PMCS, scheduled maintenance)
Wednesday	Sergeant's Time 0900 - 1530 (Battle Drills, fire mission processing, METL tasks at Section level)	Sergeant's Time (Section Level training, fire mission processing, METL tasks at Section level, in two Batteries)	Individual task training as scheduled by Battery (unless external taskings intervene)	Individual task training as scheduled by Battery (unless external taskings intervene)	Individual task training as scheduled by Battery (unless external taskings intervene)
Thursday	Individual task training as scheduled by Battery (unless external taskings intervene)	Individual task training as scheduled by Battery (unless external taskings intervene)	AM - Sergeant's Time (Section Level training, fire mission processing, METL tasks at Section level); PM - Individual task training	Individual task training as scheduled by Battery (unless external taskings intervene)	Sergeant's Time (Section Level training, fire mission processing, METL tasks at Section level)
Friday	Vehicle maintenance, motor pool clean-up, etc.	Vehicle maintenance, motor pool clean-up, etc.	Individual task training as scheduled by Battery (unless external taskings intervene)	Vehicle maintenance, motor pool clean-up, etc.	Vehicle maintenance, motor pool clean-up, etc.

[1] Sources for this information include review of weekly training schedules for MLRS Batteries, and comments made in a large number of interviews at each site. Shaded areas in the table indicate scheduled time for Section-echelon collective training in garrison.

Field Training in MLRS Battalions. Both Battalions reported conducting Battalion-level FTXs. The Battalion at Site 1 reported two FTXs; a third had been planned during the period between the two reported, but was canceled and a CPX conducted instead. The Battalion at Site 2 reported conducting four Battalion-level FTXs during the period of interest, as well as two Battalion CPXs. Elements of this Battalion also participated in a Deployment Exercise.

Battery field training was reported to occur more frequently than Battalion training. While no information on specific dates was available, Batteries in the Battalion at Site 1 were said to go to the field for a combined live fire exercise and FTX about once per quarter per Battery. In live fire, this Battery reported attempts to equalize the number of rockets fired across crews, even to the extent of rotating crews into launchers when their own launchers were not capable of live firing. In the Battalion at Site 2, dates were available to identify five Battery-level FTXs during the period of interest. This information evidently did not capture all Battery-level field training, as comments in numerous interviews indicated that a typical Battery in this Battalion might go to the field as frequently as once a month, for a week. Live fire in the Battalion at Site 2 was reported to take place quarterly, during Battery FTXs. Attempts to equalize the amount of live firing across crews were also reported in this Battery. Personnel in both Batteries report that most rocket firing is single-shot rather than ripple firing. The stated purpose of this is to maximize the number of different missions fired by each crew. A stated goal was to have each crew fire three different missions each quarter: one 'When Ready;' one 'At My Command;' and one 'Time on Target.'

Little field training below Battery level was reported by the MLRS Battalions. None at all was reported for the Battalion at Site 1. Personnel in the Battalion at Site 2 reported that occasional one-day Platoon STXs are conducted in at least one of the Batteries. No other information to support this report was available.

Neither of the MLRS Battalions reported having participated in major training events, nor having participated in Combined Arms training with maneuver elements.

It was reported by personnel in both Battalions that emphasis during field training is on fire mission processing (and generation, in the case of echelons above Section), and that relatively few other tasks were typically exercised during field training. Realistic tactical (*i.e.*, Platoon relocation after a number of fire missions) and logistic play (reloading under realistic tactical scenarios, and resupply distances and travel times) were not cited as occurring frequently in field training

Field Training in MLRS Separate Batteries. Two of the three MLRS Separate Batteries surveyed conducted Battery-level field training during the period of interest; it was reported that the third (Site 3) did not. Only two Battery-level FTXs could be identified as having been conducted by the Battery at Site 4. These were coordinated with live fire exercises. A third live fire exercise was reported for this Battery. The Battery at Site 5 reported conducting a quarterly FTX one week in duration, followed by a week in the field for live firing. This Battery (Site 5) reported that live fire could not be distributed equally across crews because of safety certification problems with some soldiers. The other Batteries did not report how live fire is distributed across crews.

In two of the Batteries, little or no field training was reported below Battery echelon. One Platoon at Site 3 was reported to have participated in an FCX and to have conducted one FTX (or STX) during the period of interest. Also at this site, it was reported that live firing is done by Platoon, rather than by the Battery, and that Platoon live firing occurs about three times per year.

Site 5 reported no field training below the Battery level. At Site 5, 13 Platoon FTXs were identified as having taken place during the period March through October 1989. All four Platoons in the Battery were represented in these exercises, which generally were from one to three days in duration. This pattern changed with the arrival of a new Battery commander, who discontinued the practice of scheduling Platoon exercises and instituted more frequent Battery-level field training.

As with MLRS Battalions, it was reported that the emphasis in field training in Separate Batteries is on fire mission processing, with relatively little scenario-based exercise of other tasks.

Only one of the MLRS Separate Batteries reported participation in any major training events. Platoons from the Battery at Site 3 accompanied maneuver elements to the NTC during two rotations. Which Platoons participated was not identified. The Platoons were reported to have participated only in live-firing activities while at the NTC. Two 36-rocket packages from home station ammunition allocations were reportedly taken to the NTC to support live firing.

Garrison Training. Examination of Battery training schedules from units at each of the sites, together with information from interviews, was used to construct a typical weekly training schedule for each site. One common feature of this training is the provision of dedicated time for Section-level training (Sergeant's Time; indicated with shaded boxes in Table 11) at four of the five sites. Between two and one-half and six and one-half hours were dedicated to this training, depending on the unit. This time was reportedly spent for the most part in training Section collective tasks, particularly fire mission processing and related crew-level drills. Most such training took place in the motor pool; it was reported that Sections seldom took launchers or resupply vehicles to the field to train during Sergeant's Time. Another feature of note in the garrison training schedules is the provision of set-aside time for vehicle maintenance (also referred to as Command Maintenance). This is typically one day per week in a Battery. Additional time (generally Friday mornings) is set aside for maintenance, as well.

Personnel in all units reported frequent disruptions in carrying out planned training in garrison due to taskings from higher echelon and other levies on personnel that reduce the number available to train. This was reported as a significant issue, and is discussed at length in a later subsection.

Summary. The consensus of the information available on the training conducted by the units visited is:

1. MLRS units do not typically participate in major training events such as NTC rotations, nor do they participate in Combined-Arms training at home station to any appreciable extent.

2. A relatively small proportion of time is spent in field training. Field training is conducted as part of Battalion or Battery FTXs, typically scheduled on a quarterly basis. Live fire training is frequently combined with FTXs, or scheduled in adjacent time periods. Platoons and Sections seldom train independently outside the motor pool.

3. The majority of collective training conducted is Section-level training. This training is typically conducted in the garrison environment, rather than in the field.

4. The major task emphasis in training is fire mission processing and related Section-level tasks. Tactical and logistic play is not typically incorporated in a realistic way in field training.

5. Garrison training is frequently not carried out as planned, due to taskings and other diversions of personnel from training.

Performance Evaluation

A summary of evaluation methods used by the units surveyed is presented in Table 12. In this Table, three aspects of evaluation are addressed: external evaluations of collective task performance; internal evaluations of collective task performance; and evaluation of individual task performance.

External Evaluation: Collective Performance. Neither of the MLRS Battalions surveyed had experienced an external evaluation at the Battalion level in the period of interest. Neither had the Batteries within the Battalion at Site 1 been externally evaluated during this period. At Site 2, the Batteries within the MLRS Battalion were reported to have been externally evaluated during the period. These evaluations were performed by members of other Batteries within the Battalion, supplemented with Battalion personnel.

Of the three MLRS Separate Batteries surveyed, two had received external evaluations within the 18 months prior to site visits. These evaluations were conducted by personnel drawn from MLRS Battalions at other sites. It was reported that personnel within the Divisions where MLRS Separate Battery external evaluations were conducted did not have the knowledge or experience to serve as evaluators for the MLRS Batteries. Therefore, appropriate evaluators were sought elsewhere.

No information was made available to examine the performance of the MLRS Batteries in the Battalion where external evaluation had been done. However, information about the results of the evaluations of the Separate Batteries was available. This information indicated that both of the Separate batteries received "GO" scores on their evaluations. The After Action Review (AAR) summary (Battery Commander's notes) from the evaluations indicated that the Battery at Site 4 had the following weaknesses in performance:

- Platoon Leader Reconnaissance and Selection of Position
- Maintenance of Situation Maps
- Emergency Destruction of Equipment procedures
- Positioning of resupply and survey control points for launchers
- Movement.

For the Battery at Site 5, the following weaknesses were noted in AAR:

- NBC tasks—soldiers in a mix of MOPP levels

Table 12

Performance Evaluation Methods in MLRS Units

Evaluation Domain	MLRS Battalions		MLRS Separate Batteries		
	Site 1	Site 2	Site 3	Site 4	Site 5
Collective Task Performance—External Evaluation	None conducted at Battalion or Battery level in previous 18 months	No Battalion evaluation in last 12 months; external evaluations of Batteries by other Batteries in Battalion with assistance from Battalion personnel. AMTP standards used.	None within the last 12 months	Battery ARTEP conducted 2/89 by personnel from an MLRS Battalion at another site	Battery ARTEP conducted 12/89 by personnel from an MLRS Battalion at another site
Collective Task Performance—Internal Evaluation	FTXs used by Battery commanders as opportunity to conduct "internal ARTEP" on lower echelons (AMTP standards not used)	Observation during field training used as an opportunity to diagnose proficiency problems in lower echelon units (AMTP standards not used)	Observation during field training used as an opportunity to diagnose proficiency problems in lower echelon units (AMTP standards not used)	Observation during field training used as an opportunity to diagnose proficiency problems in lower echelon units (AMTP standards not used)	Observation during field training used as an opportunity to diagnose proficiency problems in lower echelon units (AMTP standards not used)
Individual Task Performance	Techniques used include review of Job Books, assessment of CTT and SQT scores, safety certification process, and direct observation of performance. AMTP standards not used.	Techniques used include review of Job Books, assessment of CTT and SQT scores, safety certification process, review of weapons qualification records, and direct observation of performance. AMTP standards not used.	Techniques used include review of Job Books, assessment of CTT and SQT scores, safety certification process, and direct observation of performance. AMTP standards not used.	Techniques used include review of Job Books, assessment of CTT and SQT scores, safety certification process, and direct observation of performance. AMTP standards not used.	Techniques used include review of Job Books, assessment of CTT and SQT scores, safety certification process, review of weapons qualification records, and direct observation of performance. AMTP standards not used.

- Maintenance—vehicles not topped off appropriately
- Supply—vehicle load plans not followed
- Fire missions—more practice needed at Section level
- Position improvement—hide ammunition trucks better
- Reports—need to work on keeping higher headquarters informed
- Safety—ground guides not always used at night.

The standards used in performing these evaluations could not be identified from the information available.

Internal Evaluation: Collective Performance. Each of the units surveyed reported using field training as an opportunity to identify performance weaknesses in subordinate units that should be addressed in subsequent training. Evaluation in this sense was reported as being by observation of the performance of subordinate units by commanders (and staff, in the case of the MLRS Battalions). It was reported that ARTEP MTP (AMTP) Training and Evaluation Outlines (T&EOs) were not used as standards for internal collective performance evaluation. One reason that the AMTP T&EOs were not used was cited as unavailability of the AMTP until very recently. Standards reported to have been used in internal evaluation were among the documents gathered at the sites. These range from locally-prepared checklists for collective tasks at the Section through Battery levels to performance standards documents prepared by Corps Artillery headquarters (which were cited as having been developed to substitute for the then-unavailable AMTP). The level of detail, comprehensiveness, and coverage of critical tasks (as identified by the AMTP) varied widely in the documents examined. The extent to which the various documents were actually used to guide internal evaluation in the units is not known.

Evaluation of Individual Task Performance. All units surveyed reported evaluation of individual task performance as an integral part of training. This evaluation was cited as taking place primarily by observation of task performance by first-line supervisors (*i.e.*, Section Chiefs) and other unit leaders. In addition, members of each unit reported using a number of more or less standardized methods used to assess individual performance. These included the following:

- Use of Job Books by Section Chiefs to record and review individual task performance and develop individual training prescriptions
- Review of Common Task Test (CTT) and Skill Qualification Test (SQT) scores to determine what individual training is needed to improve individual performance over the unit at large
- Use of safety certification test results to diagnose individual performance weaknesses
- Use of weapons qualification records to identify needs for weapons training.

The performance standards used for individual task evaluation were not specifically reported. Given the nature of the tools used for individual evaluation, it can be presumed that the standards used correspond to some extent to the published standards in Soldiers' Manuals for the appropriate MOS.

Individual and Unit Performance

The end result of training is performance proficiency on individual and collective tasks. In this subsection, the information available to address proficiency of units and their individual members is presented. First, information addressing individual performance is presented. Then, collective task proficiency results are reviewed and discussed.

Individual Performance

The only information gathered that supports assessment of individual performance capability in the units surveyed are SQT scores from four of the five sites. This information is presented in Table 13 in the form of SQT score distributions for each unit. Some caution is deserved in interpreting this information. The scores shown are pooled across all MOS for which SQT scores are available. Therefore, they are best used as comparative, rather than absolute, indications of individual performance capability in the units.

Overall, these scores seem to reflect reasonable individual task proficiency. One index that can be used for comparison is the Army-wide average SQT score for MOS 13M, 80 percent. The composite of SQT scores for the entire sample (last columns in Table 13) indicates that 54 percent of soldiers scored 80 percent or higher. While the units' scores are not all from 13M personnel, this result argues that individual skills are, in general, reasonably well-developed in soldiers in these units.

Examining the data comparatively, it is interesting to note that overall SQT scores for personnel in MLRS Separate Batteries were higher than those for MLRS Battalions (see the cumulative percentage columns in the Table). There was also considerable SQT score variability within the subgroups MLRS Battalions and MLRS Separate Batteries. These data will be used in examination of relationships between unit performance and unit training conditions, later in this section of the report.

Collective Task Performance

Objective data on collective task performance that could be used to draw relationships between performance and other factors were not collected in this study. The information on unit performance presented in this subsection is based on the ratings of task performance proficiency by unit members and representatives of higher echelons, as described in the previous section of this report. The information discussed here should not be thought of as reflecting measured task proficiency of the units. Rather, this information is a summary of *opinions* as to how the units would perform, if evaluated at the time the information was gathered.

Table 13

Skill Qualification Test (SQT) Scores of Personnel in MLRS Units

SQT Score Range	Site 1			Site 2			Site 3			Site 4			Site 5		
	No. in Range	Pct. in Range	Cum. Pct.	No. in Range	Pct. in Range	Cum. Pct.	No. in Range	Pct. in Range	Cum. Pct.	No. in Range	Pct. in Range	Cum. Pct.	No. in Range	Pct. in Range	Cum. Pct.
90 - 100	52	20	20	17	7	7	No Data Available			9	12	12	6	11	11
80 - 89	117	44	64	69	29	36				32	44	56	31	60	71
70 - 79	55	21	85	82	35	71				24	34	90	15	29	100
60 - 69	27	10	95	37	16	87				7	9	98	--	--	--
50 - 59	11	4	99	25	10	98				1	1	100	--	--	--
< 50	4	1	100	7	2	100				--	--	--	--	--	--
Totals	266	100		237	100					73	100		52	52	

SQT Score Range	MLRS Battalions			Separate Batteries			Composite		
	No. in Range	Pct. in Range	Cum. Pct.	No. in Range	Pct. in Range	Cum. Pct.	No. in Range	Pct. in Range	Cum. Pct.
90 - 100	69	14	14	15	12	12	84	14	14
80 - 89	186	37	51	63	50	62	249	40	54
70 - 79	137	27	78	39	31	93	176	28	82
60 - 69	64	13	91	7	6	99	71	11	93
50 - 59	36	7	98	1	1	100	37	6	99
< 50	11	2	100	--	--	--	11	1	100
Totals	503	100		125	100		628	100	

This information does not provide a performance index that reflects what units truly can do. Rather, it is best used as a basis of comparison to address the relative effects of various factors on performance. For interpretive purposes, a rating of 5 in this information indicates a large amount of confidence that a unit can perform the tasks in a given task grouping to standard. A rating of 1, on the other hand, indicates very little confidence in a unit's ability to perform to standard.

Summaries of the ratings of unit performance at each echelon are presented in Tables 14, 15, 16, and 17. Tables 14 and 15 show performance estimates by MLRS Battery, as provided by higher echelon and self-rating, respectively. Three scores (one for each task grouping—Operations Tasks, Logistics Tasks, and NBC Tasks) and an average are shown for each echelon and Battery in these two Tables. More highly aggregated summaries are presented for higher echelon ratings and self-ratings, respectively, in Tables 16 and 17. These higher-order summaries provide broad comparisons between the MLRS Battalions and between MLRS Battalions in the aggregate and MLRS Separate Batteries.

The most significant finding is that no units rated themselves, or were rated by higher echelon, as very unlikely to do well in any of the task groupings. Confidence in units' ability to perform collective tasks to standard was generally fairly high, with a trend for higher echelons to express less confidence overall in units' performance capability than that suggested by self-ratings. However, there is considerable variability in the data that brings out some significant points.

Battalions and Separate Batteries Compared. On average, greater confidence was expressed by higher echelon raters in the performance capability of MLRS Batteries organized in Battalions than was the case for MLRS Separate Batteries. This was also the case for self-ratings. The variability of ratings by higher echelon was lower for Batteries in MLRS Battalions than for Separate Batteries. However, the opposite is true for self-ratings: less variability is found in ratings of Separate Batteries.

Ratings by Task Grouping. Examining the ratings by task grouping, MLRS Batteries overall express the most confidence (by self-rating) in their ability to perform Logistics tasks, somewhat less confidence with respect to Operations tasks, and the least confidence for NBC tasks. This general ordering also holds true for self-ratings of proficiency of Platoons and Sections within the Batteries.

Higher echelon ratings indicate the most confidence in Batteries' ability to perform Operations tasks, and somewhat less confidence with respect to Logistics tasks. NBC tasks at Battery level received the least confidence on the part of higher echelon raters. Section level tasks follow a similar pattern. For Platoons, however, higher echelons express the greatest confidence with respect to performance of Logistics tasks, less for Operations tasks, and the least confidence for NBC tasks.

Ratings by Echelon. Overall, the greatest amount of confidence in performance proficiency was expressed for the lowest echelons—Firing and Ammunition Sections. Platoons, overall, received the next highest amount of confidence in ability to perform, while the Battery echelon overall received the smallest amount of confidence. This is the case across higher echelon and self-ratings. This appears to relate closely to the reported frequency of training that took place at each echelon: Section-level training was the most frequent overall across the sample; Battery-level training was the least frequent.

Table 14

Ratings of MLRS Units' Task Performance Proficiency by Personnel from Higher Echelons

Echelon	Task Grouping	Site 1			Site 2			Site 3	Site 4	Site 5
		Higher Echelon Ratings of Performance for Battery Coded:								
		A	B	C	D	E	F	G	H	I
Battery	Operations	4.1	4.5	4.6	4.3	4.6	4.5	4.8	3.9	3.3
	Logistics	3.8	4.0	4.0	4.5	4.6	4.5	4.0	3.6	3.9
	NBC	3.2	3.6	3.6	3.8	4.6	4.6	—	3.2	2.6
	Average	3.7	4.0	4.1	4.2	4.6	4.5	4.4	3.6	3.3
Firing Platoon	Operations	4.0	4.4	—	—	4.8	3.4	3.7	4.2	4.0
	Logistics	4.2	4.3	—	—	5.0	4.0	3.9	4.2	4.2
	NBC	3.8	3.8	—	—	5.0	2.8	3.9	3.4	4.0
	Average	4.0	4.2	—	—	4.9	3.4	3.8	3.9	4.1
Firing Section	Operations	4.8	4.9	4.7	4.5	4.7	—	4.4	4.6	4.5
	Logistics	4.5	5.0	4.5	4.3	5.0	—	4.2	4.7	4.3
	NBC	4.6	4.4	4.2	3.5	4.5	—	4.0	4.2	4.2
	Average	4.6	4.8	4.5	4.1	4.7	—	4.2	4.5	4.3
Ammunition Section	Operations	4.4	4.2	3.9	4.4	3.3	5.0	—	3.3	4.1
	Logistics	4.4	4.5	5.0	5.0	4.0	5.0	—	2.5	3.0
	NBC	4.0	4.1	3.2	4.7	3.5	5.0	—	3.2	3.2
	Average	4.3	4.3	4.0	4.7	3.6	5.0	—	3.0	3.4

Table 15

MLRS Units' Self-Ratings of Unit Task Performance Proficiency

Echelon	Task Grouping	Site 1			Site 2			Site 3	Site 4	Site 5
		Unit Members' Self-Ratings of Performance for Battery Coded:								
		A	B	C	D	E	F	G	H	I
Battery	Operations	4.4	4.1	4.4	4.7	4.9	4.2	4.2	3.9	3.5
	Logistics	4.8	3.7	4.5	5.0	5.0	3.8	4.1	4.4	3.9
	NBC	3.2	3.3	3.5	4.9	4.9	2.8	3.2	3.4	3.6
	Average	4.1	3.7	4.1	4.9	4.9	3.6	3.8	3.9	3.7
Firing Platoon	Operations	4.4	4.3	4.5	4.4	4.5	—	4.3	4.6	4.3
	Logistics	4.4	4.9	4.4	4.3	4.7	—	4.0	4.6	4.0
	NBC	4.5	4.7	4.4	3.4	4.0	—	3.0	4.2	3.9
	Average	4.5	4.6	4.4	4.0	4.4	—	3.8	4.5	4.1
Firing Section	Operations	4.6	4.8	4.8	4.4	4.8	4.7	4.2	4.8	4.5
	Logistics	4.5	5.0	4.8	4.8	4.7	4.5	4.4	4.6	4.8
	NBC	4.4	4.0	4.4	4.2	4.0	3.7	2.6	4.4	4.1
	Average	4.5	4.6	4.7	4.5	4.5	4.3	4.1	4.6	4.5
Ammunition Platoon	Operations	4.9	3.6	3.5	4.6	3.4	4.8	3.6	3.0	3.2
	Logistics	5.0	4.3	3.9	4.7	3.9	4.9	3.9	3.8	4.0
	NBC	—	—	—	—	—	—	—	—	—
	Average	4.9	4.0	3.7	4.6	3.7	4.8	3.7	3.4	3.6
Ammunition Section	Operations	4.4	4.4	4.7	3.7	4.1	5.0	—	4.7	3.9
	Logistics	4.7	5.0	5.0	4.7	5.0	5.0	—	5.0	5.0
	NBC	3.9	4.9	4.6	4.2	3.6	5.0	—	5.0	3.7
	Average	4.3	4.8	4.8	4.2	4.2	5.0	—	4.9	4.2

Table 16

Summary of MLRS Unit Performance Ratings Made by Higher Echelons

Echelon	Task Grouping	Summary of Higher Echelon Ratings for:			
		Site 1	Site 2	Batteries in Battalions	Separate Batteries
Battery	Operations	4.4	4.5	4.4	4.0
	Logistics	3.9	4.5	4.3	3.8
	NBC	3.5	4.3	4.0	2.9
	Average	3.9	4.4	4.2	3.6
Firing Platoon	Operations	4.2	4.1	4.2	4.0
	Logistics	4.3	4.5	4.4	4.0
	NBC	3.8	3.9	3.9	3.8
	Average	4.1	4.2	4.2	3.9
Firing Section	Operations	4.8	4.6	4.6	4.5
	Logistics	4.7	4.7	4.5	4.4
	NBC	4.4	4.0	4.2	4.1
	Average	4.6	4.4	4.4	4.3
Ammunition Section	Operations	4.2	4.3	4.2	3.7
	Logistics	4.6	4.7	4.7	2.8
	NBC	3.8	4.4	4.1	3.2
	Average	4.2	4.5	4.3	3.2

Table 17

Summary of MLRS Unit Self-Ratings of Task Performance Proficiency

Echelon	Task Grouping	Summary of Self-Ratings for:			
		Site 1	Site 2	Batteries in Battalions	Separate Batteries
Battery	Operations	4.3	4.6	4.5	3.9
	Logistics	4.3	4.6	4.5	4.1
	NBC	3.3	4.2	3.8	3.4
	Average	4.0	4.5	4.3	3.8
Firing Platoon	Operations	4.4	4.4	4.4	4.4
	Logistics	4.4	4.5	4.5	4.2
	NBC	4.6	3.7	4.1	3.3
	Average	4.5	4.2	4.3	4.1
Firing Section	Operations	4.7	4.6	4.6	4.5
	Logistics	4.8	4.7	4.7	4.6
	NBC	4.3	4.0	4.2	4.0
	Average	4.6	4.4	4.5	4.4
Ammunition Platoon	Operations	4.0	4.3	4.2	3.3
	Logistics	4.4	4.5	4.4	3.9
	NBC	—	—	—	—
	Average	4.2	4.4	4.3	3.6
Ammunition Section	Operations	4.5	4.3	4.4	4.3
	Logistics	4.9	4.9	4.9	5.0
	NBC	4.5	4.3	4.4	4.4
	Average	4.6	4.5	4.5	4.6

The Batteries in the MLRS Battalion at Site 1 received less confidence by self-rating and higher echelon rating than did those in the Battalion at Site 2. However, the reverse was true for lower-echelon units (Site 1 Platoons and Sections received greater confidence in proficiency overall than Site 2 Platoons and Sections). This result at the Battery level may be explained in terms of training frequency—Site 2 reported more frequent training at the Battery level than did Site 1. Similarly, the MLRS Separate Battery that reported the most frequent field training (Site 4) also expressed the greatest confidence overall in its ability to perform to standard, while the Separate Battery with the least reported field training (Site 3) expressed the least confidence in its own capability, across all echelons. These results appear to bear out the common-sense finding that more training results in better performance (or in this case, greater confidence in the ability to perform).

Training Issues and Problems Reported by MLRS Units

Several significant training issues and problems were reported by the units surveyed in interview comments and in responses to the training resources and training detractors questionnaires that were distributed. This subsection discusses these issues and problems.

Table 18 identifies the major training issues expressed by unit members, by site. The entries in the Table indicate the interviews in which particular problems were reported. As backup for the information in Table 18, Table 19 presents a summary of responses to the training detractors questionnaire completed during interviews, by site and echelon. The most prevalent detractors reported are emphasized in this Table by shading (which indicates that a majority of echelons at a site reported the same detractor conditions occurring with high frequency). The following paragraphs discussing training issues are organized according to the issues summarized in Table 18.

Land Availability

A training resource problem reported at all five sites is the availability of land (i.e., training areas that support MLRS unit training in accordance with doctrine). Units most commonly report that this situation limits field training in accordance with doctrine for deployment, even for non-live-fire training, to lower echelon units (*i.e.*, Battalions report that they can deploy a Battery to doctrinal dispersion, but not the entire Battalion; Separate Batteries report being able to deploy a Platoon, but not the Battery). Further, a lack of variety in the training areas that are available is reported (*i.e.*, the same areas must be used by the same units repeatedly).

Reported consequences of this situation include the following:

- The value of time spent in the field in often-used training areas is reduced, because some tasks—land navigation, survey operations, reconnaissance and selection of positions—are best trained in unfamiliar terrain. Soldiers and leaders quickly "learn" terrain with repeated use, and subsequent training in these familiar areas does not exercise the skills needed to perform these tasks in unfamiliar terrain.

Table 18

Training Issues and Problems Reported by MLRS Units

Issues[1]	Batteries in Battalions		MLRS Separate Batteries		
	Site 1	Site 2	Site 3	Site 4	Site 5
Land Availability (Training areas sufficient to train doctrinally)	I01, I03	I24	I39, I41, I45, I51, I54	I59, I65	I81, I83
Availability of Firing Points and Live Fire Restrictions	I01, I03		I39, I41, I45, I51, I54		
Training Cycle (MLRS units' priority for resources)	I03	I24	I44	I59, I65	I81, I84
MLRS Launcher Reliability	I01, I02, I03, I07	I27, I32, I35, I36	I39, I41, I45 - I56		I81, I83, I85, I90, I91, I94, I95, I98
Availability of Spare Parts for MLRS Launchers	I04	I25	I46, I49, I51	I64, I66, I74, I77	
Organizational Placement of MOS 27M Personnel	I17	I25, I27, I32, I34	I39, I44, I46, I47, I55	I61, I67, I68, I70, I71	I84, I85, I87, I91, I95, I96
Personnel Turnover	I01, I02, I06, I14	I24	I40	I57, I62	I81, I83, I88
Personnel Fill	I02, I03, I14	I23, I24	I45	I62, I73, I78	I83, I84, I89, I94, I95, I96, I98
Match Between TOE Grade Structure and Personnel Assigned	I04, I05, I10	I23, I36	I40		I80
External Taskings	I03	I30, I36	I45, I47, I48, I50, I52	I68, I70, I76	I81, I83, I84, I86, I87, I90, I91 - I98
Skills of Newly Assigned Personnel (out of AIT)		I37, I38	I49, I54, I55	I61, I65, I68, I75, I76, I78	I86, I87, I89, I90, I93, I98

[1] Table entries indicate the interview(s) in which particular issues were reported.

Table 19

Training Detractor Conditions Reported by Personnel in MLRS Units

Training Detractor Conditions[1]	MLRS Batteries in Battalions								MLRS Separate Batteries											
	Echelons at Site 1				Echelons at Site 2				Echelons at Site 3				Echelons at Site 4				Echelons at Site 5			
	H[2]	B	P	S	H	B	P	S	H	B	P	S	H	B	P	S	H	B	P	S
Low Fill	●	●			●	●	[3]	●		●		●			[3]	●		●	[3]	●
Low Participation		●		●				●		●		●		●				●		●
Low Performance		●			●															
Turbulence		●	●															●		
Post Support and Details	●	●	●	●				●	●	●	●	●		●			●	●		●
Lack of Equipment or Materiel								●				●								
Ammunition not Available	●				●			●	●	●	●			●						
Ranges not Available	●	●		●	●	●		●	●	●	●						●	●		
Training Areas not Available	●	●	●	●	●	●			●	●	●	●		●			●	●		
Late/Last Minute Taskings	●	●	●	●				●	●	●	●	●						●		●
Schedule Changes—Higher Echelon		●	●	●	●	●		●	●	●		●		●						●
Low Common Task Performance								●												
Not Enough Time to Train	●	●	●			●		●	●	●		●						●		

[1] Entries in the table indicate that at least 50 percent of respondents at an echelon reported that particular training detractors were encountered at least 50 percent of the time.

[2] Echelon codes are as follows: H indicates the echelon above Battery (Battalion at Sites 1 and 2; DIVARTY at Sites 3, 4, and 5); B indicates Battery; P indicates Platoon; S indicates Section.

[3] Training detractors questionnaires were inadvertently not distributed to personnel at Platoon echelon at Sites 2, 4, and 5.

- The amount of realism in training is limited because of the inability of sub-units to deploy to doctrinal distances from one another. This limits the amount of realistic play that is incorporated in training exercises, particularly in tasks involving redeployment and in logistics operations (*i.e.*, realistic travel distances and times are not involved in resupply).

Competition for the available training land with other units was also universally reported. MLRS units are reported to consistently receive lower priorities for the available training areas than do maneuver units at the same installations (see below).

Availability of Firing Points and Live Fire Restrictions

At two of the sites surveyed, units reported that the number of firing points for MLRS live firing were very limited, as well as restrictions on when live firing can take place. Site 1 reported that only three firing points, all within 250 meters of each other are available. Site 3 reported similar limitations.

At Site 1, the time "window" for live firing was reported to be from 1700 - 0600, restricting live firing generally to nighttime hours At Site 3, live firing was reported to be restricted to similar hours, but on weekends only. The reason cited for these restrictions is concern with the possibility of hazards from overhead fire of practice rockets.

The restriction to a limited number of firing points clearly limits the tactical realism that can be incorporated in live-fire training. When only a few firing points can be used, unit dispersal to doctrinal distances cannot be done. Also, unit personnel were reported to quickly learn the geography of the limited number of firing points and associated hide and reload points, so that realistic challenges to land navigation skills do not take place during live fire training.

A related restriction reported by several sites is the requirement that check launchers, or "shadow SPLLs" be used during live firing. In this case, a second launcher does firing computations for fire missions in parallel with the launcher that is to fire the mission. If the computations for launcher laying do not agree, the mission is not fired. This clearly detracts from realistic tactical play in training. In combat, there will be no opportunities to perform parallel computations and comparisons for fire missions; launchers will fire autonomously.

Training Cycles: MLRS Units' Priority for Training Resources

All five units surveyed reported that there is constant competition for resources needed to conduct training—particularly training land (as cited above) and range time. It was reported that, since the MLRS units are not typically involved in preparation for major off-post training events or involved in combined arms training, they receive lower priorities for training resources than do maneuver units that are engaged in such training. In terms of the training management cycle, MLRS units report that they are "Forever Amber." This clearly places limitations on the amount, frequency, and realism of field training that units are able to conduct.

MLRS Launcher Reliability

Four of the five units surveyed reported frequent and sometimes prolonged breakdowns of MLRS launcher equipment. This was cited as resulting in a general low availability rate for launchers. Some of these units are equipped with some of the oldest deployed SPLLs in the MLRS fleet; more frequent breakdowns can be expected with older equipment. However, even units with much newer equipment report relatively high breakdown rates with respect to the LLM and electronic components. Less frequent were comments regarding reliability of the carrier, although some problems were reported in this area also.

Two consequences of low equipment availability rates were reported. Because of the expectation of high breakdown rates, and therefore reduced equipment-related combat readiness ratings, some units have developed reluctance to deploy launchers to the field for training (this was particularly the case at Site 3). This reduces the absolute amount of training conducted.

Second, high equipment downtime rates reduce the amount of tactical realism that can be included in either live fire or non-live fire training when launchers *are* taken to the field. Several units reported the need to rotate crews through the available functional launchers in order to obtain live firing experience for all unit members. A reduced number of available launchers also limits the amount of command and control realism that can be incorporated in non-live fire exercises, and possibly the number of subordinate units that can participate. This is not restricted to home-station training. The one unit that participated in NTC rotations reported that there were availability problems with the launchers that were taken to the NTC, and that one or two launchers were used for all live firing during the NTC rotations.

Other Issues Related to Launcher Availability

Two related issues were cited by the units surveyed as contributing to problems of MLRS launcher availability. These are the availability of spare parts to effect repairs on the MLRS launchers, and the organizational placement (and therefore, availability) of MOS 27M personnel.

Spare Parts Availability. Four of the five units surveyed reported that obtaining spare parts to repair "down" launchers is often delayed, resulting in unnecessarily extended downtime for the launchers. Spare parts are reportedly not stocked in the units in quantities related to the breakdown rates of launcher components. Most frequently mentioned in this regard were components of the Fire Control System and the computer; electronics interconnecting cables were also cited as being in short supply. It was further cited that the supply system is often slow in procuring parts that are not stocked locally, or that have been drawn down by other repairs.

Funding levels were also reported to be a problem with spare parts procurement in some cases. It was reported that the procurement of some major (and costly) items has to be funded from units' allocations for Class IX supply items. Acquisition of a relatively small number of expensive items can severely draw down the available funding to procure other spare parts.

Organizational Placement of MOS 27M Personnel. All five units cited this issue as more or less of a problem related to equipment availability. Personnel in MOS 27M are not attached directly to the MLRS units, even though they are trained and utilized specifically to repair MLRS equipment. These personnel are attached to the Divisional or Corps Direct Support unit, instead.

Because of this attachment, MOS 27M personnel were cited as not always promptly available to perform repairs when they are needed, particularly when the MLRS unit is in the field.

It was reported that, when these personnel are in the field, acting as contact teams or in other support roles for the MLRS unit, they frequently do not have available the spare parts needed to perform repairs. This was said to result in extended downtimes, due to the need for the maintainers to return to garrison and obtain the needed spare parts, then return to the field and perform repairs. This was reported to be even more of a problem during nighttime training, since supply organizations in garrison do not normally operate during those hours.

Another issue cited with respect to MOS 27M personnel is the reportedly low ratio of NCOs to junior enlisted personnel in the direct support organization. This was cited as creating problems with unavailability of more advanced troubleshooting and diagnostic skills, and contributing to extended downtime because fault isolation is sometimes difficult. As one NCO stated: "...they don't get much adult supervision over there."

Personnel Turnover

Table 20 summarizes the monthly and annual-equivalent personnel turnover rates reported by each of the units surveyed. To summarize, the rates of personnel change (not including internal turbulence, or reassignment of personnel from one position to another) was reported to be 10 percent per month or higher for all units except the MLRS Battalion at Site 1. This is equivalent to more than replacing the entire unit over a year's time.

The impact of such high turnover rates on training was reported to be to limit training to repetitive skill acquisition, rather than a mix of skill acquisition and sustainment. A related effect is a trend to conduct repetitive training on basic skills during Section-level training in the units surveyed.

Another effect which may be related to high turnover rates is the local requirement reported by most of the MLRS units for safety certification of launcher crewmembers prior to being allowed to live fire. If a soldier occupies a new position in a launcher crew, the soldier is required to pass a certification test (usually with both written or oral knowledge and hands-on dry-fire components) before the crew can participate in live fire. The validity of such certification was reported to be limited to either six months or a year, depending on the unit reporting. In one case, a Battalion commander reported personally conducting parts of the quarterly safety certification for crews in his unit.

Addressing the data in Table 20 comparatively, turnover in MLRS Separate batteries averages much higher than turnover in MLRS Battalions, although the Battalion rate is quite high itself. However, if the Battalion at Site 1 had reported turnover rates as high as the Battalion at Site 2, the rates for the two different organization types would be essentially the same.

The reported turnover rates appear to be related closely to self-reported confidence in performance proficiency of the units, for Platoon and Section echelons. Units with higher turnover rates tended to self-rate their confidence in performance proficiency lower than did units with lower turnover rates (refer to Table 15 and examine Site 1 in comparison to Sites 2, 3, 4, and 5). This is not borne out by higher echelons' expressed confidence in performance proficiency, however.

Table 20

Turnover Rates in MLRS Units

Period[1]	Site 1 Jan - Dec 89	Site 2 Jul 89 - Jan 90	Site 3 Not given	Site 4 Not given	Site 5 Mar - Jun 90	Battalions Average	Separate Battery Average	Overall Average
Rate per month (percent)	4.3	12.0	10.0	12.0	14.0	8.2	12.0	10.5
Annual Equivalent	52.0	144.0	120.0	144.0	168.0	98.0	144.0	125.0

[1] Data where dates are shown were provided by the S-1 of higher echelon units (Battalion or DIVARTY). For sites 3 and 4, data are estimates provided by personnel in interviews 139 and 157, respectively.

Personnel Fill

Each of the five units surveyed had some shortfall in the number of assigned personnel at the times site visits were made. Table 21 summarizes the identified shortfalls in personnel. These data are derived from Standard Installation and Division Personnel System (SIDPERS) *Unit Manning Reports: Position and Incumbent Data* obtained at the sites, except for Site 4, where data were derived from slides prepared for the Battery Commander's quarterly training briefing to DIVARTY.

The most severe shortfalls of warfighting-MOS personnel (13M and 13P) were found at Sites 2 and 5. Site 5 was by far the unit with the most severe personnel fill problem of those surveyed. Sites 1 and 5 had the most severe shortages of personnel in low-density supporting MOS.

Of the two MLRS Battalions surveyed, it is interesting to note that the Battalion (Site 2) with the more severe shortfall in warfighting MOS reported conducting more field training and expressed greater confidence in units' performance proficiency. This may be related to the fact that the Battalion at Site 2 has a primary deployment readiness commitment, whereas the Battalion at Site 1 does not.

Among the MLRS Separate Batteries, the Battery (Site 5) with the most severe personnel shortfalls expressed the least confidence in performance proficiency, both by self-report and by higher echelon ratings, at the Battery echelon. At Platoon and Section echelons, however, confidence in performance proficiency was similar to that expressed by the other two Separate Batteries. Interestingly, the Separate Battery at Site 3, which had the least severe personnel fill situation among the Batteries, also reported the least field training but confidence in performance proficiency at the Battery echelon was comparable to that of the other Separate Batteries.

Match Between TOE Grade Structure and Personnel Assigned

All of the units for which data are available experienced some mismatch between the grades authorized for some positions and the personnel that filled the positions at the time site visits were made. These mismatches are summarized in Table 22 for MOS 13M and MOS 13P, low-density MOS, and officers.

Only the Separate Battery at Site 5 had shortfalls in grade assigned versus authorized for MOS 13P (MLRS Fire Direction Specialist); this unit also had the most extreme situation overall with respect to position fill versus grade authorization.

Units where more positions tended to be filled with personnel of the specific grades authorized had more expressed confidence in performance proficiency (both by self-report and higher echelon rating) at the Battery echelon. This was true for Platoons and Sections in the MLRS Separate Batteries, as well. In MLRS Battalions overall, however, there was greater confidence expressed with respect to performance proficiency at the Platoon and Section levels in the Battalion with the more severe fill to grade authorization shortfall situation. As mentioned above, this may be related to the fact that the Battalion at Site 2 has a readiness and deployment commitment that is not shared by the Battalion at Site 1.

Table 21

Personnel Fill in MLRS Units

Personnel Categories	MLRS Battalions					
	Site 1			Site 2		
	Number Authorized	Number Shortfall	Percent Shortfall	Number Authorized	Number Shortfall	Percent Shortfall
High-Density (Warfighting) MOS: 13M and 13P	273	5	1.8	273	44	15.8
Low-Density (Supporting) MOS: CMF 31, 44, 52, 54, 63, 71, 75, 76, 77, 82, 91, 94	146	36	24.7	146	29	19.9
Officers (O-1 to O-3)	24	6	25.0	24	2	8.3
Totals*	448	47	10.4	448	75	16.6

* Three officers in other grades and two warrant officers are included in Battalion authorized totals.

Personnel Categories	MLRS Separate Batteries								
	Site 3			Site 4			Site 5		
	Number Authorized	Number Shortfall	Percent Shortfall	Number Authorized	Number Shortfall	Percent Shortfall	Number Authorized	Number Shortfall	Percent Shortfall
High-Density (Warfighting) MOS: 13M and 13P	94	0	0	94	9	9.6	94	36	38.3
Low-Density (Supporting) MOS: CMF 31, 44, 52, 54, 63, 71, 75, 76, 77, 82, 91, 94	21	4	19.9	21	No data	No data	21	11	52.4
Officers (O-1 to O-3)	6	0	0	6	0	0	6	2	33.3
Totals	121	4	3.3	121	N/A	N/A	121	49	40.5

Table 22

Match Between Personnel Assigned and Authorized Grades[1]

MOS	MLRS Battalions		MLRS Separate Batteries		
	Site 1	Site 2	Site 3	Site 4	Site 5
13M (MLRS Crewmembers and Ammunition Specialists)	29 positions (of 229 personnel assigned) are filled by personnel one or more grades lower than authorized for the position	6 positions (of 185 personnel assigned) are filled by personnel one or more grades lower than authorized for the position	Information *Not* Available for Site 3	7 positions (of 71 personnel assigned) are filled by personnel one or more grades lower than authorized for the position	19 positions (of 46 personnel assigned) are filled by personnel one or more grades lower than authorized for the position
13P (MLRS Fire Direction Specialists)	No discrepancies	No discrepancies		No data available	10 positions (of 12 personnel assigned) are filled by personnel one or more grades lower than authorized for the position
Low-Density MOS (CMF 31, 44, 52, 54, 63, 71, 75, 76, 77, 82, 91, 94)	5 positions (of 110 personnel assigned) are filled by personnel one or more grades lower than authorized for the position	No discrepancies		No data available	No discrepancies
Officers (13B)	6 Lieutenants short (2 per Battery)	No discrepancies		No data available	All Lieutenants assigned are O-1 (O-2 authorized)

[1] Source: Unit Manning Reports (Position and Incumbent Data) provided by higher echelon S-1 at four sites.

In general, units with more severe mismatches between grade authorized and personnel assigned reported conducting less field training than those with a closer match of assigned personnel to grades authorized.

External Taskings

All the units surveyed reported that planned training was frequently disrupted due to taskings from higher echelons, that diverted the soldiers to be trained to administrative and support activities. The MLRS Separate Batteries reported the most severe impacts of external taskings on the ability to train in accordance with their plans, but MLRS Battalions also reported this to be a major training detractor. Many taskings from higher echelon were cited as being of a last-minute nature, leaving little opportunity to adjust training plans to attempt to gain time to train.

In MLRS Battalions, taskings are reported to be somewhat more mission-related than in MLRS Separate Batteries. The Battalion at Site 1 is frequently tasked to support test and evaluation activities; members of this Battalion report that this is in line with their stated mission. A major tasking for the Battalion at Site 2, as mentioned, is a commitment for one Battery to be ready at all times to deploy with maneuver units on very short notice. Post support and details were also cited as detractors from training in the MLRS Battalions.

MLRS Separate Batteries reported two major types of taskings that served as training detractors: (1) requirements to participate in demonstrations (including FCXs) and provide equipment and soldiers for static displays of MLRS equipment; and (2) post support and details. It was noted that when MLRS units participated in FCXs, the ammunition fired came from the units' annual allocation of rockets. Firing under such administrative conditions was reported to have little training value.

Skills of Newly Assigned Personnel

New Advanced Individual Training (AIT) graduates assigned to the units surveyed were generally cited as having reasonably adequate skills in the rudiments of fire mission processing—a critical Section-level task. However, four of the five units reported that new AIT graduates lack skills that, if possessed by the graduates, would reduce the training burden on the unit and make the newly assigned personnel more immediately able to contribute as unit members. The skills specifically cited were: (1) SPLL and HEMTT driving skills; and (2) skills and knowledge required to perform preventive maintenance on launchers. Also, it was reported that getting new personnel military licenses to drive SPLLs and HEMTTs was frequently a problem for the units; it was suggested that these licenses be acquired during AIT.

General Training Resources Issues

Personnel in the units surveyed completed training resources availability questionnaires as part of some interviews. These questionnaires were designed to probe the extent to which resources needed to train were available to the units. Due to some oversights, not all personnel that were intended to complete the questionnaires did so. For example, only DIVARTY S-3s filled out resource

availability questionnaires for MLRS Separate Batteries. Therefore, a complete perspective on resource availability was not developed.

A summary of the training resource shortfalls reported by questionnaire is shown in Table 23. Any discrepancies between the results shown in this Table and the discussions above are due to the failure to have questionnaires completed by all the personnel that were intended to do so. The following paragraphs discuss several resource availability issues that were brought out during interviews with units' personnel.

Live Ammunition. This refers to ammunition items other than MLRS rockets, a separate topic which is discussed below. Small arms ammunition allocations were reported by three units as being insufficient for qualification of all personnel who are supposed to qualify with given weapons annually. This was attributed partly to the fact that ammunition allocations are based on the number of personnel that use specific weapons by TOE, but that the actual number of personnel who should qualify is increased because of turnover. In one case, a unit commander substituted "familiarization" requirements for some weapons for qualification.

Printed Reference Materials. This refers to Soldiers' Manuals, Trainers' Guides, Technical Manuals, and other printed training reference material. Several comments were made that available quantities of some publications (Soldiers' Manuals, Trainers' Guides) were insufficient for the number of personnel that should routinely refer to that material. In at least one case, it was noted that updates for Technical Manuals for both the SPLL and the HEMTT were difficult to obtain, and that maintainers were working with out-of-date information.

Radios. At several sites, the reliability and availability of AN/VRC-46 and AN/VRC-47 radios was cited as sometimes interfering with training. The age of the specific radio sets available was mentioned as being the problem, rather than their design, operating features, or maintainability.

Night Vision Devices. Personnel at three of the sites reported that night vision goggles are difficult to come by, because maneuver units have a priority on obtaining such devices. This was reported to reduce the value of nighttime training for personnel in the MLRS units.

ARTEP MTP. Personnel at several sites commented that they were aware of the recent publication of ARTEP 6-398-30-MTP, but that it had not yet to their knowledge reached their units. A consensus of remarks indicated that the need for this publication was broad-based in the units surveyed.

NBC Equipment. One reason cited by personnel at several sites for low confidence in performance proficiency for NBC tasks was the difficulty of obtaining access to the equipment required to practice hasty chemical decontamination. In some cases, unit members reported they had never practiced this task at all, because the equipment was very difficult to come by due to competition with other units for this resource.

Experience of MLRS Unit Personnel

From the beginning of this study, one finding considered likely was that the experience and skills of personnel in MLRS units would be major determinants of the performance proficiency of the units. Accordingly, information on the experience of personnel was sought during interviews.

Table 23

Training Resource Shortfalls Reported by MLRS Units

Training Resources Shortfalls Reported[1]	MLRS Batteries in Battalions		MLRS Separate Batteries		
	Site 1	Site 2	Site 3	Site 4	Site 5
Live Ammunition	●	●	●		
Soldier's Manuals	●				
Trainer's Guides	●				●
Technical Manuals	○				
Training Reference Material	●	○			●
MLRS Launchers	●				●
Blank Ammunition	●	●			
Spare Parts	●	○			
Radios	○			●	
Night Vision Devices	●			●	●
Field Manuals	○	○			
ARTEP MTP	●	○			
NBC Equipment	●				
Net Control	○	○	●		

[1] Source: Training Resources Availability Questionnaires completed during interviews. Filled bullets in the table indicate that at least 50 percent of respondents at a site reported that availability of a category of training resources was a problem at least 50 percent of the time. Open bullets indicate that problems were encountered obtaining the indicated resources when needed, but not to the same extent. These results are collapsed over echelons that completed the questionnaire.

Interviewees were requested to provide information on their time in military service, time in current grade, and time in their present position in their units. The data gathered were unfortunately incomplete; this information is not available for all personnel interviewed. Enough data were obtained, however, to develop experience profiles of unit personnel so that these characteristics can be contrasted with expressed confidence in performance proficiency. Summaries of personnel time in service, time in grade, and time in position are presented in Tables 24, 25, and 26, respectively.

Time in Service. In summary, personnel in MLRS Separate Batteries generally had less overall time in service than those in MLRS Battalions. This was true for both officer and NCO personnel. Comparisons of time in service with expressed confidence in performance proficiency yield the following findings:

- The MLRS Battalion with longer-service NCOs had higher overall ratings of confidence in performance proficiency by higher echelon at Battery level than did the other Battalion.

- The MLRS Separate Battery with the least-experienced NCOs and an intermediate amount of experience in officers nevertheless had the highest overall ratings by higher echelon of confidence in performance proficiency at Battery level.

- The MLRS Separate Battery with the highest self-rating of confidence in performance proficiency at the Battery level had the most experienced officers of the Separate Batteries. The Separate Battery with the least expressed confidence at Battery level (by self-rating) had the NCOs and officers with the smallest average amount of time in service of the Separate Batteries.

- The MLRS Battalion with higher expressed confidence in performance proficiency at the Platoon and Section levels had NCOs with slightly less time in service than the other Battalion.

- The MLRS Separate Battery with the highest overall expressed confidence in performance proficiency at Platoon and Section levels had the most experienced officers and an intermediate amount of NCO experience.

Time in service overall appears to be positively related to expressed confidence in performance proficiency, based on these findings.

Time in Grade. MLRS Battalions also had both officer and NCO personnel with greater time in grade, on average, than did MLRS Separate Batteries. Some specific findings are:

- The MLRS Battalion with NCOs with greater time in grade had higher overall ratings of confidence in performance proficiency at Battery level than did the other Battalion.

- The MLRS Separate Battery with the greatest expressed confidence in performance proficiency had officers with more time in grade than did other Separate Batteries, and an intermediate amount of time in grade for NCOs.

Table 24

Time in Service Data (Months) for Key Personnel in MLRS Units (by Site)

Positions Held	MLRS Batalions						MLRS Separate Batteries								
	Site 1			Site 2			Site 3			Site 4			Site 5		
	Mean	s.d.	N	Mean	s.d.	N	Mean	s.d.	N	Mean	s.d.	N	Mean	s.d.	N
Battery Commanders	80.0	13.8	3	84.0	17.0	2	72.0	--	1	108.0	--	1	108.0	--	1
Operations Officers	45.0	21.2	2	24.0	--	1	No Data			36.0	--	1	No Data		
Platoon Leaders	36.0	17.0	2	36.0	--	1	41.3	38.3	3	70.0	58.9	3	10.5	3.5	2
Platoon Sergeants	147.1	32.4	7	177.0	29.7	2	154.5	27.0	4	171.0	31.6	4	155.3	51.2	4
Section Chiefs	116.8	33.8	17	126.0	42.2	7	106.3	34.2	9	104.8	35.7	12	116.1	47.4	11
Gunners	84.5	30.1	11	90.0	--	1	49.6	16.9	7	66.0	26.1	3	94.2	37.5	5
Means	NCO: 122.7 Officer: 57.4			NCO: 132.6 Officer: 57.0			NCO: 96.0 Officer: 49.0			NCO: 112.6 Officer: 70.8			NCO: 118.5 Officer: 43.0		

Table 25

Time in Grade Data (Months) for Key Personnel in MLRS Units (by Site)

Positions Held	MLRS Batalions						MLRS Separate Batteries								
	Site 1			Site 2			Site 3			Site 4			Site 5		
	Mean	s.d.	N	Mean	s.d.	N	Mean	s.d.	N	Mean	s.d.	N	Mean	s.d.	N
Battery Commanders	22.5	2.2	2	24.0	--	12	18.0	--	1	60.0	--	1	60.0	--	1
Operations Officers	3.5	3.5	2	No Data			No Data			12.0	--	1	No Data		
Platoon Leaders	No Data			No Data			7.0	3.0	3	10.3	2.9	3	10.5	3.5	2
Platoon Sergeants	63.8	31.5	4	36.0	--	1	23.3	32.5	4	58.5	24.1	4	50.2	20.7	4
Section Chiefs	44.7	20.6	11	55.5	11.4	4	10.8	8.9	9	37.0	22.0	12	35.7	21.8	11
Gunners	48.0	30.2	7	42.0	--	1	23.0	9.9	7	29.7	19.7	3	41.2	40.1	5
Means	NCO: 49.2 Officer: 13.0			NCO: 50.0 Officer: 24.0			NCO: 17.6 Officer: 9.8			NCO: 40.4 Officer: 21.2			NCO: 40.0 Officer: 27.0		

Table 26

Time in Position Data (Months) for Key Personnel in MLRS Units (by Site)

Positions Held	MLRS Batalions						MLRS Separate Batteries								
	Site 1			Site 2			Site 3			Site 4			Site 5		
	Mean	s.d.	N	Mean	s.d.	N	Mean	s.d.	N	Mean	s.d.	N	Mean	s.d.	N
Battery Commanders	14.0	–	1	2.5	2.1	2	1.0	–	1	10.0	–	1	9.0	–	1
Operations Officers	18.0	–	1	No Data			No Data			12.0	–	1	No Data		
Platoon Leaders	13.0	10.1	3	12.7	4.7	7	13.0	9.6	3	12.0	1.7	3	7.0	7.0	2
Platoon Sergeants	14.0	17.0	5	16.4	17.9	8	8.5	10.9	4	25.8	38.9	4	16.8	13.0	4
Section Chiefs	17.9	15.0	18	18.9	19.6	10	8.2	7.3	9	8.8	8.9	12	18.5	19.1	11
Gunners	19.1	10.4	7	4.7	5.7	6	6.4	5.1	7	7.0	4.6	3	13.4	9.7	5
Means	NCO: 17.5 Officer: 14.2			NCO: 14.5 Officer: 9.9			NCO: 7.6 Officer: 10.0			NCO: 12.0 Officer: 11.6			NCO: 16.9 Officer: 7.7		

- The Separate Battery with the least expressed confidence at Battery level had the NCOs and officers with the smallest average amount of time in grade of the Separate Batteries.

- The MLRS Battalion with both officers and NCOs with greater time in grade had higher overall ratings of confidence in performance proficiency at Platoon level than did the other Battalion. The reverse was true, however, for proficiency ratings at Section level.

- The MLRS Separate Battery with the highest overall expressed confidence in performance proficiency at Platoon and Section levels had officers with the most time in grade of the Separate Batteries and an intermediate amount of time in grade for NCOs.

Time in grade also appears to be positively related to expressed confidence in performance proficiency.

Time in Position. As with the other experience measures, MLRS Battalions generally had longer average time in present duty position than did MLRS Separate Batteries for both officers and NCOs. However:

- The MLRS Battalion with the greatest expressed confidence in performance proficiency at Battery and Platoon echelons had less average time in position for both officers and NCOs than did the other Battalion. The opposite was true for confidence in performance proficiency at Section echelon.

- The MLRS Separate Battery with the greatest expressed confidence in performance proficiency at all echelons had officers with more time in position than did other Separate Batteries, and an intermediate amount of time in position for NCOs. The Separate Battery with the least expressed confidence in performance proficiency at all echelons had the smallest average amount of time in position of the Batteries for NCOs, and an intermediate amount for officers.

As well, time in position appears to bear a positive relationship with expressed confidence in performance proficiency.

In summary, data on each of the variables support the existence of a positive relationship between expressed confidence in performance proficiency and the experience of personnel making up the leadership of units at all levels.

Considering other relationships drawn above, it appears that experience may in a sense compensate for other factors that tend to result in lower expressed confidence in performance proficiency (greater amounts of turnover, less personnel fill in key MOS). This is illustrated by the fact that the unit that expressed the greatest confidence in proficiency overall (Site 2) experienced high rates of turnover and had relatively low personnel fill, but had the highest average amounts of time in service and time in grade among its officers and NCOs.

Summary of Relationships Among Factors

Examining the results presented in the aggregate, some summary statements can be made with respect to relationships between unit performance (as reflected by expressed confidence in the ability to perform to standard) and other factors examined. Units with the greatest amount of expressed confidence in performance proficiency (among those included in the study) have the following characteristics:

- They train more frequently in the field than do less proficient units.
- They report somewhat fewer training detractor conditions to be problems than do less expressed proficient units (most notably, heavy taskings with post support and details).
- They have more time to train than less proficient units (or, at least, voice fewer complaints about lack of it).
- They have better fill to grade authorization than less proficient units.
- They report fewer shortfalls in needed training resources than do less proficient units.
- They possess more experienced, mature NCO and officer leaders than do less proficient units.
- Paradoxically, they have lower levels of individual skill as reflected by SQT score distributions) than do less proficient units.

Admittedly, these results (save for the last) would be predicted by common sense. However, this points out the seriousness of the conditions with which the MLRS units surveyed must contend in order to train effectively.

Conclusions

The results presented make evident the following conclusions with regard to the units surveyed.

- *MLRS units do not presently train as they intend to fight.*
  - They do not train frequently to develop and sustain skills at all levels and echelons.
  - When they do train in the field, much of the training is fire mission processing (possibly among the simplest and most straightforward tasks done by these

units), rather than exercising the full spectrum of METL and critical tasks at each echelon.

- They do not train in accordance with the doctrine for the deployment and employment of MLRS in combat (*i.e.*, in their full organizational configurations).

- They do not participate in major training events (*i.e.*, CTC rotations), or in combined arms and services training.

- They do not incorporate realistic play of tactics or logistic assets in training that is conducted.

- *While units generally express considerable confidence in their performance proficiency, such confidence may not be warranted—because:*

  - Training does not include the full range of METL or critical tasks, practiced with reasonable frequency, under conditions that reflect combat situations.

  - Echelons for which there is evidence of more frequent training (Section, and to some extent, Platoon) express the greatest level of confidence in their capability to perform, both by self-rating and higher-echelon rating. This may reflect that critical leader and command and control tasks performed by higher echelons are at lower levels of proficiency than those typical of lower echelons.

  - Training is infrequent. Skills deteriorate unless they are sustained by practice.

- *MLRS units face significant difficulties in training as they will fight, based on a spectrum of factors, including:*

  - Equipment reliability. A lack of operable equipment limits the scope of training that can take place, in the absence of deployed training devices.

  - Availability of adequate maneuver areas and firing ranges. This limits the degree and realism of training in accordance with doctrine that can take place.

  - High rates of turnover. When trained individuals leave units in large numbers, the "training clock" restarts, and the unit must begin anew to provide skill basics for the newcomers.

  - Insufficient personnel of appropriate grades to fill the unit TOE. This places limitations on the skills of the available trainers and imposes an even heavier burden of "train the trainer" upon the units.

  - Frequent and unpredictable taskings by higher echelons. Soldiers are diverted from scheduled training frequently, losing never-to-be-regained opportunities to acquire and sustain skills.

- For MLRS Separate Batteries, extraordinary responsibility for planning and conducting training, under conditions of essentially no specific guidance and little support from higher echelons.

Live Fire Training

The original impetus of this study was to provide information to establish whether the current allocation of 108 rockets per Battery per year for live firing is adequate to develop and sustain training. The study did not acquire information appropriate to make this determination.

Numerous opinions were expressed by the personnel interviewed on the adequacy of the current allocation to support training. The general consensus is that *the current allocation is a minimum*. Some personnel expressed a specific desire that additional ammunition be allocated, but this was generally in response to specific conditions obtaining in one unit, and is not the general sense of the comments that were made. All of those who spoke to this topic agreed that live fire training is important, at least as a capstone and verification that other training is effective and skills have been developed. However, no specific rationale for a precise number of rockets or frequency of live fire training was determined. Some of the arguments favoring live fire training include the following.

- *Live fire demands attention to detail that can otherwise be overlooked.* This is simultaneously a criticism of present methods of non-live fire training and a challenge to training developers to create training situations that replicate the live-fire situation to the greatest extent possible, demanding the required attention to detail and providing appropriate feedback when such attention is lacking.

- *Live fire builds crew confidence in MLRS system capabilities.* Frequent reports of the unreliability of MLRS launchers, along with the low regard with respect to launcher reliability expressed by interviewees, raise doubts as to whether the current level of live fire training, or increased amounts of live fire, will have this effect.

- *Live fire creates breakdowns and problems that do not occur in dry fire training, that crews will otherwise not learn to deal with.* The same comment applies here as made to the first argument above. In addition, an unequivocal justification of additional training benefits would be required before making a commitment to additional allocations of ammunition for this purpose.

- *Live fire is a source of troop motivation.* This is doubtless true. However, it does not lessen the requirement to develop clear and convincing justification for ammunition allocated for this purpose.

Clearly, this issue will have to be resolved by further study. In such study and determinations, decision makers should address several factors concerning measurable training benefits, in addition to the cost of ammunition for training. Some of these are:

- *Turnover*. The high rates of turnover reported by practically all the units surveyed suggest that the benefit *to the training unit* of much of the training that does occur may be quickly lost. The value of live fire as a training capstone should be considered in this light; the progression of training from individual to crew to collective training should also be considered in terms of where soldiers actually fall on the training continuum.

- *Material Reliability and Availability*. Is more benefit gained from rotating crews through a reduced number of firing mission-capable launchers than is to be had from doctrinally realistic dry-fire training with adequate command and control and logistic play? Can the latter be had in a cost-effective way?

- *Organizational Priorities*. MLRS units surveyed in this study are beset by numerous issues and problems that restrict training. Some of these are related to the relationships between the MLRS units and higher echelons. Are there modifications that can or should be made to these relationships that would allow MLRS units to improve their training?

SECTION FOUR

RECOMMENDATIONS

Based on the findings of this study, several specific recommendations for improving MLRS training can be made. This section presents the recommendations.

Enhance Support for MLRS Separate Battery Training

Two key findings of this study are that MLRS Separate Batteries lack guidance and support for training from higher echelon MLRS organizations, and that there is an absence of "training roadmaps" to guide training in these units. In conjunction with high levels of turnover and related difficulties of developing and sustaining trainer skills, these units experience extraordinary difficulty in attaining effective training. Therefore, it is recommended that a USAFAS-approved training and evaluation system for MLRS Separate Batteries be developed and made available for use by the Batteries. This will provide the needed "training roadmaps" to improve training in these units. Key features of such a system should include:

- Training plans and outlines that enable the development and conduct of progressive, multi-echelon training that is responsive to unit training needs. The progressive nature of training should emphasize skill development beginning at the individual level, progressing to crew-level skills, and finally to collective training at all echelons.

- Outlines and objectives for a brief train-the-trainer course, to prepare unit personnel to serve effectively in their roles as trainers.

- Training objectives (tasks, conditions, and standards) to serve as objective standards for internal evaluation, to supplement the (variable) criteria presently applied in the absence of such guidance. The recent publication of ARTEP 6-398-30-MTP may serve this function.

- Training materials, including drills, that support execution, evaluation, recording, and using the results of training at all echelons from Section through Battery.

- Support for both initial skills development and skill sustainment.

- Recommendations to aid training scheduling, based on actual conditions of unit turbulence and turnover and the occurrence of simple forgetting over time.

While such a training and evaluation system would provide the greatest benefit for MLRS Separate Batteries, it should also be made available to MLRS Battalions to be used as a resource to improve training.

A separate finding of this study is that personnel occupying higher echelon positions with respect to MLRS Separate Batteries (*i.e.*, DIVARTY commanders and key staff) frequently lack an appreciation and understanding of the potential of MLRS as a force multiplier, as well as of MLRS doctrine and tactical employment. This may be related to the lower levels of higher-echelon guidance and support reported by Separate Batteries as compared to MLRS Battalions. It is recommended that provisions be made to improve the understanding of the value, role, and utilization of MLRS on the part of such personnel by either or both of the following means:

- Expand MLRS-specific elements of Service School courses for both officers (Artillery Officers' Basic and Advanced Courses and possibly the pre-command course) and NCOs (Advanced Non-Commissioned Officers' Course and Sergeants Major Academy courses) to include increased emphasis on MLRS tactics, maintenance, and training.

- Develop officer and NCO short courses to be conducted for currently assigned personnel at local installations, covering MLRS materials from Service School courses.

Enhance MLRS Units' Capability to Train as They Will Fight

Another key finding of this study is that MLRS units do not have available the amount of training land required to train in accordance with doctrine, and experience keen competition with other home station units for the land that is available. This is not a problem that will likely be addressed by increasing home station resources. Also, MLRS units were found not to participate in major training events (including CTC rotations) nor to take part in combined arms and services training. A recommended solution to these problems in to enhance the capability of MLRS units to participate in training at the National Training Center. Currently, units must provide their own vehicles and support in order to participate in NTC rotations. One reason cited by interviewees for not participating in NTC rotations is the cost of doing so; funding priority supporting NTC rotations goes to maneuver units, who are reportedly seen as receiving more benefit from rotations than MLRS units.

In order to increase the availability of opportunities for MLRS units to participate in NTC rotations, and thus more closely approximate the goal of training as they will fight, it is recommended that a permanent MLRS facility be established at the NTC. This facility would include:

- Unit sets of equipment for at least an MLRS Firing Platoon and an MLRS Ammunition Section, as well as equipment to equip a Battery "slice" of supporting and headquarters personnel.

- A maintenance facility for MLRS equipment, including dedicated direct support personnel.

- Possible provision of ammunition for rotation units to supplement home-station ammunition allocations. (This issue requires separate study.)

Only personnel from home-station units would be rotated through this facility. Supplementary equipment and additional personnel could be brought from home station if funding could be obtained and the training benefits were justified.

Enhance Capabilities for Cost-Effective Home Station Training

One finding of this study is that much training taking place at home stations concerns fire mission processing. To accomplish such training, MLRS launchers are the only means that can currently be used. Given the expressed problems with launcher reliability and availability, there may be more cost-effective training modes for these tasks that also enable greater amounts of training to take place.

Accordingly, it is recommended that capabilities to train fire mission processing without activating or using MLRS launchers be developed or acquired. These might take the form of:

- Provide part-task training devices similar to the FCS trainers located at the Field Artillery School; or

- Provide a capability to mount FCS components on wheeled vehicles (*e.g.*, HMMWV) so that training can take place in the field environment. Such vehicles could also be used to train on land navigation and other terrain appreciation and analysis tasks, movement techniques, and resupply operations.

Another finding of this study is that there is less confidence in the capability to perform collective tasks at higher unit echelons than at lower echelons. This can be interpreted to mean that additional training may be desirable for tasks involving tactics, use of terrain, reconnaissance and selection of positions, resupply, recovery, and maintenance. Current training modes appear not to support much training for these sorts of tasks. To provide such additional training, it is recommended that a sand-table kit and supporting training materials be developed or acquired for MLRS units' use in training these types of tasks. The units surveyed reported some success in using locally developed resources of this type for training.

One effect of the limited availability of training land reported by the units surveyed was to limit the amount of useful training involving terrain appreciation and analysis and tactical planning. This was because soldiers and leaders rapidly learned the characteristics of available training areas; repeated training in familiar areas was reported to have little value in training such skills. Several suggestions were made by interviewees that an exchange program be established that would allow soldiers and leaders to visit other MLRS-equipped posts in order to utilize unfamiliar terrain for training, to develop and sustain such skills. Only personnel would be exchanged between units; equipment would remain at assigned home station locations. Development of such a program is recommended.

Reduce Unit Training Burdens

One issue reported as being a considerable burden to units is the requirement to supplement SPLL and HEMTT driver training provided during MOS 13M AIT. Given the high reported rates of turnover, this probably has the effect of delaying the readiness of newly assigned personnel to participate in unit training. To reduce this unit training burden and enhance the readiness of new personnel to train with their units, it is recommended that SPLL and HEMTT driver training portions of 13M AIT be strengthened.

Provide Institutional Support for Improved MLRS Unit Training

The recommendations presented above, if implemented, can enhance MLRS units' capability to train and to train as they will fight. Such implementation should, however, be coordinated and have the benefit of the control and guidance of a central agency. This could be assured by establishing a system, possibly as an element within the Field Artillery school, to oversee the development, validation, and distribution of guidance, initiatives, and products that result from implementing these recommendations. This agency would also receive and act upon feedback regarding the utility of the enhanced training support products to further improve the MLRS training system.

APPENDIX A

DATA COLLECTION INSTRUMENTS

This Appendix presents data collection instruments used during interviews with unit personnel. The interview guides included are the versions used with MLRS Separate Battery and DIVARTY personnel. Except for unit type names in specific questions (Battalion vice DIVARTY), the content of the interview guides is the same as that used with MLRS Battalion personnel. An index to the location of specific items follows.

- A copy of the standard introductory statement used at the beginning of interviews is presented beginning on **Page A-2.**
- Interview guides for DIVARTY Commander/XO, DIVARTY S-1, DIVARTY S-3, DIVARTY S-4, Battery Commander/Operations Officer/First Sergeant, Firing Platoon Leader/Platoon Sergeant, Firing Section Chief/Gunner, Ammunition Platoon Leader/Platoon Sergeant, and Ammunition Section Chief are presented beginning on **Page A-4.**
- Task performance proficiency questionnaires for MLRS Battery, MLRS Firing Platoon, MLRS Firing Section, MLRS Ammunition Platoon, and MLRS Ammunition Section appear beginning on **Page A-35.**
- The training detractors questionnaire is presented on **Page A-42.**
- The training resources questionnaire is presented on **Page A-43.**

Introduction: Introduce yourself (by name and brief personal qualifications). You represent the Army Research Institute (ARI), performing a study on behalf of the Individual and Unit Training Directorate (IUTD) of the Department of Training Development (DOTD) at the Field Artillery School.

The purpose of the study is to identify effective ways for MLRS units to meet their training and readiness goals using the resources that are available to the units. For the study, we are interviewing and gathering information from individuals from Firing Section to Battalion or Division Artillery level.

All information will be gathered by interviews or by extracting data from records that units maintain. All interviews will be confidential, and all data will be reported and used without attribution to individuals.

Study Overview: The study will be conducted in three phases. Phase One (the phase we are in now) involves gathering information directly from MLRS units. We will visit the MLRS Battalions (and subordinate Batteries) at
and the MLRS separate Batteries at
Data collection will take place between now and the first week of June.

We are gathering three kinds of information. The first kind is about current training programs. This includes issues such as: how and when MLRS units at all levels from Battery to Section train; the proficiency of the units and individuals in the units; how training resources are used and how much they cost; and issues and problems that MLRS units encounter in training.

The second kind of information is about conditions in the unit that affect training, training management, and performance. Issues here include: turnover and turbulence; personnel fill; how soldiers match with their jobs; and the quality of personnel (in terms of aptitude, experience, and skills).

The third kind of information deals with how units perceive and use the training products that TRADOC provides. Products include: school graduates; the AMTP; and other kinds of training support products. We're also interested in learning about new training support products that units would like TRADOC to provide.

We will analyze this information to relate unit proficiency to training and the conditions that exist in MLRS units.

This will have payoffs of two kinds. The first kind is short-term. From the data, we will identify tips for the MLRS trainer and training manager. These might include training methods, techniques, aids, devices, and strategies that help units achieve high levels of unit proficiency. These can be distributed immediately to MLRS units to help improve unit training programs.

The second kind of payoff is longer-term, and involves Phases Two and Three of this study. The relationships between unit proficiency and the kind and amount of training units do, the use of training resources, and unit conditions will be used to design several prototype training programs for MLRS

units. This will be done by ARI and Subject Matter Experts at the Field Artillery School, in Phase Two. All of the prototype training programs will maintain unit proficiency at acceptable levels. The programs will differ in the amounts of training resources used and in training strategies and methods.

In Phase Three, MLRS Firing Platoons will test each of the prototype training programs over a nine-month period. The Platoons' performance will be measured at the beginning and the end of the period. Any performance changes will be related to the training programs.

The combined findings from Phases One and Three will be used to update training and doctrine publications produced by TRADOC. These updates may include recommended training methods and strategies, guidance on effective uses of resources, and other ways to improve proficiency.

Cut-over: What we would like to request from you are two things. The first is your assistance in

Second, we have some questions that we would like for you to answer from your perspective. We can deal with these in the order you prefer.

Interview: I'd like your permission to tape-record this interview. I will use the tape only to clarify my written notes from the interview.

First, I need some information about your background and experience.

APPENDIX B

CHARACTERISTICS OF INTERVIEWEES

Twelve data items are presented in the list in this Appendix. As is evident, not all data items were gathered for every individual interviewed. Missing data are indicated for numeric data items by the entry of a zero. For textual data items, missing data are indicated by a blank space. An exception to the missing data rules is ECHELON—all echelon entries are complete as they are presented. The following discusses the meaning of each of the 12 data items.

INT NO.	A unique number assigned to each interview, for tracking purposes.
SITE	The Site code assigned to the interview sites. Valid enties are 1, 2, 3, 4, and 5.
ECHELON	The organizational echelon identification, including Batery, Platoon, and Section, of the person interviewed. Valid values for Battery are A through I. Valid codes for Platoon are 1 through 3, and A. Valid codes for Section are 1 through 3.
POSITION	A 4-character abbreviation for the position the person interviewed occupied in the MLRS unit or a higher echelon unit. Valid entries are: BNCO - Battalion Commander; BNS1 - Battalion S-1; BNS3 - Battalion S-3; BNS4 - Battalion S-4; DACO - Division Artillery Commander; DAS1 - Division Artillery S-1; DAS3 - Division Artillery S-3; DAS4 - Division Artillery S-4; DTNG - Division Artillery Training Officer; PAC - Personnel Administration Clerk; BYCO - Battery Commander; BYOO - Battery Operations Officer; B1SG - Battery First Sergeant; OPSG - Battery Operations Sergeant; COMM - Battery Communications Chief; PLDR - Platoon Leader; PSGT - Platoon Sergeant; RECN - Reconnaissance Sergeant; SCHF - Section Chief; GUNR - Gunner; DRIV - Driver; A/SC - Assistant Section Chief (Ammunition Platoon only).
GRADE	The military grade of the interviewee. O indicates officer grade; E indicates enlisted grade.
TIME IN SVC	The number of months an interviewee had been on active duty service at the time of the interview.
TIME IN POSN	The amount of time an interviewee had held his present position at the time of the interview.
TIME IN GRADE	The amount of time the interviewee had held his present military grade, as of the time of the interview.
ENL	Whether officer interviewees had prior enlisted service. This entry is meaningless for enlisted personnel. Valid values are Yes and No.

CMD	Whether officer interviewees had held commands at any echelon prior to assuming their present position. Valid values are Yes and No.
MISL	Whether interviewees had prior experience with missile systems other than MLRS. Valid values are Yes and No.
MLRS	Whether interviewees had held positions in MLRS units prior to the position they occupied at the time of the interview. Valid values are Yes and No.

MLRS Training Study
Data on Personnel Interviewed

Int No.	Site	Btry Plt Sec Echelon	Position	Grade	Time in Srvc	Time in Posn	Time in Grade	ENL	CMD	MISL	MLRS
1	1		BNCO	O5	222	16	24	N	Y	Y	Y
2	1		BNS1	O2	48	7	0	N	N	N	N
3	1		BNS3	O4	156	0	2	N	Y	N	Y
4	1		BNS4		0	0	0	Y			
5	1	A	BYCO	O3	96	0	0				N
5	1	A	BYOO	O2	0	0	0				Y
5	1	A	B1SG	E8	252	0	0				Y
5	1	A	OPSG	E6	0	0	0				Y
6	1	A 1	PSGT	E7	192	18	0				Y
6	1	A 3	PSGT	E7	204	42	0				Y
6	1	A A	PSGT	E7	240	0	0				Y
7	1	A 1 1	SCHF	E5	72	18	0				Y
7	1	A 1 1	GUNR	E4	48	6	0				Y
7	1	A 1 2	SCHF	E6	114	3	0				Y
7	1	A 1 2	GUNR	E5	72	6	0				Y
8	1	A 2 1	SCHF	E6	0	12	0				N
8	1	A 2 2	SCHF	E6	0	0	0				Y
8	1	A 2 3	SCHF	E6	0	36	0				Y
8	1	A 2	RECN	E6	0	0	0				Y
9	1	A 3 1	SCHF	E6	0	28	0				Y
9	1	A 3 1	GUNR	E5	0	21	0			Y	Y
9	1	A 3 2	SCHF	E5	0	20	0				Y
9	1	A 3 2	GUNR	E5	0	24	0				Y
9	1	A 3 3	SCHF	E5	0	39	0			Y	Y
9	1	A 3 3	GUNR	E5	0	35	0				Y
9	1	A	COMM	E5	0	38	0				Y
10	1	A A 1	SCHF	E5	96	42	0				Y
10	1	A A 2	SCHF	E5	204	32	0				Y
10	1	A A 3	SCHF	E5	120	45	30				Y
11	1	B	BYCO	O3	72	0	24				Y
11	1	B	BYOO	O2	60	0	1				Y
11	1	B	B1SG	E8	204	0	1				Y
12	1	B 1	PLDR	O2	24	24	0				N
12	1	B 1	PSGT	E6	0	0	0				Y
12	1	B 2	PSGT	E7	0	0	0				Y
13	1	B 2 1	SCHF	E6	108	0	0				Y
13	1	B 2 1	GUNR	E5	72	18	0				Y
13	1	B 2 2	SCHF	E6	144	0	0				Y
13	1	B 2 2	GUNR	E5	0	0	0				Y
13	1	B 2 3	SCHF	E6	72	2	0				Y

MLRS Training Study
Data on Personnel Interviewed

Int No.	Site	Btry Plt Sec Echelon	Position	Grade	Time in Srvc	Time in Posn	Time in Grade	ENL	CMD	MISL	MLRS
13	1	B 2 3	GUNR	E5	114	0	0				Y
14	1	B A	PLDR	O2	0	11	0				Y
14	1	B A	PSGT	E6	0	1	0				Y
14	1	B A 1	SCHF	E6	0	7	0				Y
14	1	B A 3	SCHF	E6	0	6	0				Y
15	1	C	BYCO	O3	72	14	21	N	Y	N	N
15	1	C	BYOO	O2	30	18	6	N		N	N
15	1	C	BlSG	E8	192	1	1			Y	Y
16	1	C 2	PLDR	O2	48	4	0				N
16	1	C 1	PSGT	E7	216	0	60				Y
16	1	C 2	PSGT	E7	144	7	21				Y
16	1	C 3	PSGT	E7	216	0	84				Y
16	1	C A	PSGT	E6	168	2	90				Y
17	1	C 1 1	SCHF	E6	144	0	72				Y
17	1	C 1 1	GUNR	E5	0	0	72				Y
17	1	C 1 1	DRIV	E4	0	0	24				Y
17	1	C 1 3	SCHF	E6	0	0	24				Y
17	1	C 1 3	GUNR	E5	72	0	12				Y
18	1	C 2 1	SCHF	E6	144	6	60				Y
18	1	C 2 1	GUNR	E5	72	24	0				Y
18	1	C 2 2	SCHF	E5	108	7	60				Y
18	1	C 2 2	GUNR	E5	96	0	48				Y
18	1	C 2 3	SCHF	E6	96	2	24				Y
18	1	C 2 3	GUNR	E5	96	0	24				Y
19	1	C 3 1	SCHF	E6	132	0	6				Y
19	1	C 3 1	GUNR	E5	156	0	96				Y
19	1	C 3 2	SCHF	E6	96	0	48				Y
19	1	C 3 2	GUNR	E5	48	0	24				Y
19	1	C 3 3	SCHF	E6	144	0	60				Y
19	1	C 3 3	GUNR	E5	84	0	60				Y
20	1	C A 1	SCHF	E5	72	12	48				Y
20	1	C A 1	A/SC	E5	72	1	4				Y
20	1	C A 2	SCHF	E6	120	6	60				Y
20	1	C A 2	A/SC	E5	108	5	0				Y
21	2		BNCO	O5	0	0	0		Y	N	N
22	2		BNXO	O4	0	0	0				
23	2		BNS1	O3	66	6	14		Y		Y
24	2		BNS3	O4	0	0	0				
25	2		BNS4	O3	84	8	24				Y
26	2	D	BYCO	O3	96	0	0				Y
26	2	D	BYOO	O2	24	0	0				Y
27	2	D 1	PLDR	O2	0	11	0				
27	2	D 1	PSGT	E7	0	24	0				
27	2	D 2	PLDR	O2	0	18	0				Y

MLRS Training Study
Data on Personnel Interviewed

Int No.	Site	Btry Plt Sec Echelon	Position	Grade	Time in Srvc	Time in Posn	Time in Grade	ENL	CMD	MISL	MLRS
27	2	D 2	PSGT	E6	0	1	0				Y
27	2	D 3	PLDR	O1	0	9	0				
27	2	D 3	PSGT	E6	0	2	0				Y
28	2	D 1 1	SCHF	E5	0	0	0				Y
28	2	D 1 1	GUNR	E4	0	1	0				
28	2	D 1 2	SCHF	E5	0	0	0				Y
28	2	D 1 3	SCHF	E5	0	0	0				Y
28	2	D 1 3	GUNR	E4	0	1	0				
28	2	D 3 2	GUNR	E5	0	1	0				Y
29	2	D 3 1	SCHF	E5	0	3	0				Y
29	2	D 3 1	GUNR	E4	0	12	0				Y
29	2	D 3 2	SCHF	E6	0	36	0				Y
29	2	D 3 2	GUNR	E5	0	12	0				Y
29	2	D 3 3	SCHF	E6	0	12	0				Y
30	2	D A	PLDR	O1	0	7	0				Y
30	2	D A	PSGT	E7	0	7	0				Y
30	2	D A 1	SCHF	E6	0	6	0				Y
30	2	D A 2	SCHF	E6	0	0	0				
30	2	D A 3	SCHF	E5	0	0	0				
31	2	E	BYCO	O3	0	4	0				Y
31	2	E	BYOO	22	0	0	0				Y
31	2	E	B1SG	E8	0	0	0				Y
32	2	E 3	PLDR	O2	0	20	0				N
32	2	E 2	PSGT	E7	0	36	0				Y
33	2	E 2 1	SCHF	E5	0	0	0				Y
33	2	E 2 1	DRIV	E4	0	1	0				
33	2	E 2 2	SCHF	E5	0	2	0				Y
33	2	E 2 2	DRIV	E4	0	24	0				Y
33	2	E 2 3	SCHF	E6	0	4	0				Y
33	2	E 2 3	DRIV	E3	0	7	0				Y
34	2	E A	PLDR	O2	36	12	0				Y
34	2	E A	PSGT	E5	156	0	0				Y
34	2	E A 1	SCHF	E5	132	0	0				Y
34	2	E A 2	SCHF	E5	120	0	0				Y
34	2	E A 3	SCHF	E5	108	0	0				Y
35	2	F	BYCO	O3	72	1	24				Y
35	2	F	BYOO	O2	0	0	0				
35	2	F	B1SG	E8	0	0	0				
36	2	F 3	PLDR	O1	0	12	0				Y
36	2	F 1	PSGT	E7	0	0	0				Y
36	2	F 2	PSGT	E7	0	12	0				Y
36	2	F 3	PSGT	E6	0	1	0				Y
37	2	F 2	RECN	E4	50	8	12				Y
37	2	F 1 1	SCHF	E5	132	54	54				Y

MLRS Training Study
Data on Personnel Interviewed

Int No.	Site	Btry Plt Sec Echelon	Position	Grade	Time in Srvc	Time in Posn	Time in Grade	ENL	CMD	MISL	MLRS
37	2	F 1 2	SCHF	E5	72	12	48				Y
37	2	F 3	RECN	E4	72	2	2				Y
37	2	F 3 1	SCHF	E6	210	48	48				Y
37	2	F 3 1	GUNR	E5	90	1	42				Y
38	2	F A	PSGT	E7	198	48	36				Y
38	2	F A 1	SCHF	E5	108	12	72				Y
39	3		DACO	O6	0	0	0				
40	3		DAS1	O4	192	8	36	Y	Y	Y	Y
41	3		DTNG	O3	120	0	72		Y	Y	Y
42	3		DAS4	O4	192	20	45		Y	Y	N
43	3		PAC	E6	74	13	5				
44	3	G	BYCO	O3	96	20	29		N		Y
45	3	G	BYCO	O3	72	1	18		N		Y
46	3	G 1	PLDR	O2	84	20	4			N	N
46	3	G 1	PSGT	E7	156	1	6				Y
47	3	G 2	PLDR	O2	30	17	7				N
47	3	G 2	PSGT	E6	132	8	72			Y	Y
48	3	G 3	PLDR	O1	10	2	10	N	N	N	N
48	3	G 3	PSGT	E7	192	24	8				Y
49	3	G 1 1	SCHF	E5	108	1	12				Y
49	3	G 1 1	GUNR	E4	84	3	12			N	N
50	3	G 1 2	SCHF	E6	96	4	7			N	Y
50	3	G 1 2	DRIV	E2	7	3	3			N	N
51	3	G 1 3	SCHF	E6	156	24	30			N	Y
52	3	G 2 1	SCHF	E5	66	5	5				Y
52	3	G 2 1	GUNR	E4	32	8	12				Y
53	3	G 2 2	SCHF	E6	135	1	21				
53	3	G 2 2	GUNR	E4	37	5	24				Y
54	3	G 2 3	SCHF	E6	132	12	6				Y
54	3	G 2 3	GUNR	E4	44	2	27				Y
55	3	G 3 1	SCHF	E5	48	9	6				Y
55	3	G 3 1	GUNR	E4	54	14	41				Y
55	3	G 3 2	SCHF	E6	120	5	5				Y
55	3	G 3 2	GUNR	E4	48	12	24				Y
55	3	G 3 3	SCHF	E6	96	13	5				Y
55	3	G 3 3	GUNR	E4	48	1	21				Y
56	3	G A	PSGT	E7	138	1	7				Y
57	4		DACO	O6	336	24	12				
58	4		DAS1	O3	132	7	84	Y	Y	Y	Y
59	4		DAS3	O5	216	24	3	N	Y	N	Y
60	4		DAS4	O3	156	12	17	N	Y	N	Y
61	4	H	BYCO	O3	108	10	60				N
62	4	H	BYOO	O2	36	12	12				Y
63	4	H 1	PSGT	E7	216	84	84				Y

MLRS Training Study
Data on Personnel Interviewed

Int No.	Site	Btry Plt Echelon	Sec	Position	Grade	Time in Srvc	Time in Posn	Time in Grade	ENL	CMD	MISL	MLRS
64	4	H 1	1	SCHF	E6	156	12	72				Y
65	4	H 1	2	SCHF	E6	132	3	36				Y
66	4	H 1	3	SCHF	E6	120	12	48				Y
67	4	H 2		PLDR	O2	36	10	12				N
67	4	H 2		PSGT	E7	156	8	72			Y	N
68	4	H 2	1	SCHF	E6	108	24	24				Y
69	4	H 2	2	SCHF	E6	78	7	6				Y
69	4	H 2	2	GUNR	E5	84	3	39				Y
70	4	H 2	3	SCHF	E6	84	8	8				Y
70	4	H 2	3	GUNR	E5	78	12	43				Y
71	4	H 3		PLDR	O2	36	13	12				N
71	4	H 3		PSGT	E6	144	3	30				Y
72	4	H 3	1	SCHF	E6	166	28	46				Y
72	4	H 3	1	DRIV	E3	28	4	1				Y
73	4	H 3	2	SCHF	E5	78	1	55				Y
73	4	H 3	2	DRIV	E2	12	5	6				Y
74	4	H 3	3	SCHF	E5	90	1	54				Y
74	4	H 3	3	GUNR	E4	36	6	7				Y
75	4	H A		PLDR	O2	138	13	7				Y
75	4	H A		PSGT	E7	168	8	48				Y
76	4	H A	1	SCHF	E6	120	3	54				Y
77	4	H A	2	SCHF	E5	42	1	5				Y
78	4	H A	3	SCHF	E6	84	6	36				Y
78	4	H A	3	A/SC	E4	84	3	60				Y
79	5			DACO	O6	288	11	14	N	Y	Y	N
80	5			DAS1	O4	168	33	24	N	Y	N	N
81	5			DAS3	O4	168	7	36	N	Y	N	N
82	5			DAS4	O3	192	12	84	Y	Y		Y
83	5	I		BYCO	O3	108	9	60			N	N
84	5	I	1	PLDR	O1	8	2	8			N	N
84	5	I	1	PSGT	E7	153	36	45				Y
85	5	I	1 1	SCHF	E6	180	48	60				Y
85	5	I	1 1	GUNR	E5	96	30	8				Y
86	5	I	1 2	SCHF	E6	144	48	48				Y
87	5	I	1 3	SCHF	E6	72	12	10				Y
88	5	I	2	PSGT	E7	186	12	72				Y
89	5	I	2 1	SCHF	E6	144	5	10				Y
90	5	I	2 2	SCHF	E5	78	11	46				Y
90	5	I	2 2	GUNR	E5	84	14	18				Y
91	5	I	2 3	SCHF	E5	60	2	10				Y
92	5	I	3	PLDR	O1	13	12	13				N
92	5	I	3	PSGT	E7	198	7	60				N
93	5	I	3 1	SCHF	E5	102	48	60				Y
93	5	I	3 1	GUNR	E4	79	9	48				Y

MLRS Training Study
Data on Personnel Interviewed

Int No.	Site	Btry Plt Echelon	Sec	Position	Grade	Time in Srvc	Time in Posn	Time in Grade	ENL	CMD	MISL	MLRS
94	5	I	3 2	SCHF	E6	179	7	42				Y
94	5	I	3 2	GUNR	E4	56	6	24				Y
95	5	I	3 3	SCHF	E6	168	8	60				Y
95	5	I	3 3	GUNR	E5	156	8	108				Y
96	5	I	A	PSGT	E6	84	12	24				Y
97	5	I	A 1	SCHF	E6	72	9	9				Y
97	5	I	A 1	A/SC	E5	54	1	8				Y
98	5	I	A 2	SCHF	E5	78	5	38				Y
98	5	I	A 2	A/SC	E4	48	1	33				Y

APPENDIX C

TASK GROUPINGS USED FOR PROFICIENCY ESTIMATION

This Appendix contains five lists of tasks that were used in grouping and summarizing performance proficiency estimates made by self-report and higher echelon questionnaire responses. The five lists that appear here are for the following echelons:

- MLRS Battery
- MLRS Firing Platoon
- MLRS Firing Section
- MLRS Ammunition Platoon
- MLRS Ammunition Section.

MLRS Battery

Operations Tasks

Deliver MLRS Fires

Direct and Coordinate Delivery of MLRS Fires

Command and Control Battery Movement Operations

Command and Control Battery Communications Operations

Control and Coordinate Fire Missions

Establish and Maintain a BOC

Control and Coordinate Battery Operations

Establish and Maintain AM/FM Radio Comm.

Control and Use COMSEC Material

Plan, Coordinate, and Control Battery Defense

Defend and Secure Battery Area and Materiel

Logistics Tasks

Command and Control Battery Service Support Operations

Coordinate Ammunition Supply

Maintain and Report Ammunition Information

Draw Ammunition

Transport Ammunition

Establish Ammunition Holding Area

Provide Transportation of Materiel and Supplies to Firing Platoons

Perform Maintenance and Resupply Operations

NBC Tasks

Prepare for a Nuclear Attack

Respond to the Initial Effects of a Nuclear Attack

Prepare for a Chemical Agent Attack

Respond to a Chemical Agent Attack

Perform a Hasty Chemical Decontamination

MLRS Firing Platoon

Operations Tasks

Recommend Launcher Employment

Establish Survey Control by Use of Alternate Methods

Plan and Execute Survey Operations

Coordinate and Verify Survey Control Point Emplacements

Disseminate Operational Information and Instructions to Platoon Elements

Use Electronic Counter-counter Measures

Control and Use COMSEC Material

Move

Plan and Coordinate Platoon Defense

Perform Reconnaissance, Selection, and Occupation of Position

Establish and Maintain Platoon Headquarters

Coordinate and Perform Destruction of Equipment

Logistics Tasks

Maintain Communications Equipment

Coordinate Platoon Service Support

Coordinate Ammunition Resupply

NBC Tasks

Plan, Coordinate, and Control Platoon Preparations for Operations in an NBC Environment

Perform a Hasty Chemical Decontamination

MLRS Firing Section

Operations Tasks

Control and Use COMSEC Material

Perform Launcher Start-up Procedures

Execute a Launcher Fire Mission

Perform Hangfire Procedures

Perform Reconnaissance, Selection, and Occupation of Position

Recover and Displace

Conduct Reload Operations

Destroy Ammunition

Logistics Task

Maintain Communications Equipment

NBC Tasks

Prepare for a Nuclear Attack

Respond to the Initial Effects of a Nuclear Attack

Prepare for a Chemical Agent Attack

Respond to a Chemical Agent Attack

Perform a Hasty Chemical Decontamination

MLRS Ammunition Platoon

Operations Tasks

Establish and Maintain Communications

Coordinate Defense of the AHA

Use Electronic Counter-counter Measures

Control and Use COMSEC Material

Establish an AHA

Move

Plan and Coordinate Platoon Defense

Perform Reconnaissance, Selection, and Occupation of Position

Establish and Maintain Platoon Headquarters

Coordinate and Perform Destruction of Equipment

Logistics Tasks

Maintain Communications Equipment

Coordinate Platoon Service Support

Coordinate Ammunition Resupply

NBC Tasks

Plan, Coordinate, and Control Platoon Preparations for Operations in an NBC Environment

Perform a Hasty Chemical Decontamination

MLRS Ammunition Section

Operations Tasks

Draw Ammunition

Transport Ammunition

Establish an AHA

Control and Use COMSEC Material

Perform Reconnaissance, Selection, and Occupation of Position

Recover and Displace

Destroy Ammunition

Logistics Task

Maintain Communications Equipment

NBC Tasks

Prepare for a Nuclear Attack

Respond to the Initial Effects of a Nuclear Attack

Prepare for a Chemical Agent Attack

Respond to a Chemical Agent Attack

Perform a Hasty Chemical Decontamination

APPENDIX D

CATEGORIZATIONS IN THE MLRS INTERVIEW DATABASE BY CATEGORY, SITE, AND ECHELON

This Appendix contains a listing of the number of statements assigned to each of the classification categories, or "pigeonholes," in the MLRS interview database. For each category, a matrix is presented that shows the number of times statements were categorized in the category, separated by echelon and interview site. NOTE: Statements could be assigned to up to three categories. There are 2340 categorization codes assigned to the 1541 discrete statements in the database, or an average of about 1.5 categories per statement.

	Site				
	1	2	3	4	5
Category 1.1 Contents and Frequencies of Training					
Division Artillery	0	0	2	9	8
Battalion	5	10	0	0	0
Battery	2	9	6	18	14
Platoon	4	6	7	10	14
Section	15	20	50	68	97
Category 1.2 Training Strategies, Methods, and Techniques					
Division Artillery	0	0	19	11	6
Battalion	5	7	0	0	0
Battery	4	18	17	9	12
Platoon	8	14	17	23	27
Section	26	41	46	103	122
Category 1.4 Training Roadmaps, Sequence, and Hierarchy					
Division Artillery	0	0	1	1	3
Battalion	0	3	0	0	0
Battery	0	0	1	5	1
Platoon	0	2	0	1	0
Section	1	2	3	5	0
Category 1.5 Training Events					
Division Artillery	0	0	0	4	5
Battalion	1	3	0	0	0
Battery	1	2	1	1	4
Platoon	0	1	1	1	0
Section	1	1	4	1	8
Category 1.7 Training Guidance					
Division Artillery	0	0	3	6	7
Battalion	2	1	0	0	0
Battery	0	4	3	10	4
Platoon	2	2	4	5	5
Section	4	4	0	0	0
Category 1.9 Training Scheduling					
Division Artillery	0	0	2	3	4
Battalion	3	0	0	0	0
Battery	3	7	4	6	2
Platoon	3	10	5	3	4
Section	11	10	0	5	3
Category 1.10 Personnel Involved in Training					
Division Artillery	0	0	0	4	0
Battalion	0	2	0	0	0
Battery	1	4	6	0	0
Platoon	0	0	1	0	0
Section	0	1	6	0	0
Category 1.11 Actual Time Spent Training					
Division Artillery	0	0	0	0	0
Battalion	0	0	0	0	0
Battery	1	2	0	0	0
Platoon	1	4	0	0	0
Section	4	3	6	0	0

		Site				
		1	2	3	4	5
Category 1.12	Training Costs					
Division Artillery		0	0	3	0	0
Battalion		1	2	0	0	0
Battery		0	1	0	0	0
Platoon		0	0	0	0	0
Section		0	0	0	0	0
Category 2.0	Individual and Unit Performance					
Division Artillery		0	0	7	1	0
Battalion		6	6	0	0	0
Battery		2	5	4	3	0
Platoon		2	0	2	0	1
Section		4	4	1	2	0
Category 3.0	Performance Evaluation Techniques - General					
Division Artillery		0	0	0	0	0
Battalion		1	1	0	0	0
Battery		1	0	0	6	0
Platoon		1	0	0	2	0
Section		0	0	0	1	0
Category 3.1	Performance Evaluation Techniques-Type					
Division Artillery		0	0	1	3	5
Battalion		1	0	0	0	0
Battery		5	8	5	4	6
Platoon		4	11	8	14	15
Section		5	10	2	19	20
Category 3.2	Performance Evaluation Techniques-Frequency and Scope					
Division Artillery		0	0	1	1	0
Battalion		1	0	0	0	0
Battery		0	2	0	0	0
Platoon		2	2	0	1	0
Section		2	5	0	0	0
Category 4.1	Training Resources - Availability and Adequacy					
Division Artillery		0	0	14	15	14
Battalion		9	9	0	0	0
Battery		1	3	4	10	5
Platoon		2	6	6	8	6
Section		13	11	14	21	22
Category 4.2	Training Resources - Utilization					
Division Artillery		0	0	0	1	2
Battalion		0	2	0	0	0
Battery		0	2	0	0	0
Platoon		0	1	0	0	0
Section		1	0	0	0	0
Category 5.0	Critical Training Issues and Problems					
Division Artillery		0	0	3	0	8
Battalion		2	1	0	0	0
Battery		2	2	1	7	2
Platoon		0	0	1	3	7
Section		9	4	4	11	18

	Site				
	1	2	3	4	5
Category 6.0 Conditions Affecting Training and Performance-General					
Division Artillery	0	0	0	0	2
Battalion	1	4	0	0	0
Battery	1	0	0	0	0
Platoon	0	0	0	0	0
Section	0	0	0	1	1
Category 6.1 Conditions - Stability					
Division Artillery	0	0	6	7	2
Battalion	3	2	0	0	0
Battery	1	2	2	3	5
Platoon	1	0	1	2	3
Section	2	2	2	2	2
Category 6.2 Conditions - Personnel Fill					
Division Artillery	0	0	5	2	2
Battalion	6	3	0	0	0
Battery	1	3	2	1	1
Platoon	0	3	0	1	5
Section	3	3	1	2	5
Category 6.3 Conditions - Job/MOS/Grade Match					
Division Artillery	0	0	2	2	3
Battalion	3	4	0	0	0
Battery	0	0	0	1	1
Platoon	0	0	0	1	2
Section	0	0	0	0	2
Category 6.4.1 Personnel Quality - Aptitude					
Division Artillery	0	0	0	0	1
Battalion	3	1	0	0	0
Battery	0	1	0	0	0
Platoon	0	1	1	0	0
Section	1	0	1	0	0
Category 6.4.2 Personnel Quality - Experience					
Division Artillery	0	0	1	1	0
Battalion	1	1	0	0	0
Battery	1	0	1	0	0
Platoon	1	0	0	0	0
Section	4	5	0	0	1
Category 6.4.3 Personnel Quality - Skills					
Division Artillery	0	0	0	1	6
Battalion	1	1	0	0	0
Battery	0	1	1	3	1
Platoon	0	0	3	9	1
Section	2	7	8	22	18
Category 6.5 Training Detractors - General					
Division Artillery	0	0	0	2	0
Battalion	0	1	0	0	0
Battery	1	0	0	0	0
Platoon	0	2	0	0	1
Section	0	1	1	0	6

			Site				
			1	2	3	4	5
Category	6.5.1	Detractors - Equipment Reliability					
Division Artillery			0	0	16	20	5
Battalion			5	2	0	0	0
Battery			0	0	7	0	0
Platoon			1	5	9	0	0
Section			5	4	15	2	10
Category	6.5.2	Detractors - Maintenance S8					
Division Artillery			0	0	0	0	0
Battalion			0	0	0	0	0
Battery			0	0	0	0	0
Platoon			0	0	0	1	0
Section			0	1	1	0	1
Category	6.5.3	Detractors - Maintenance 27M					
Division Artillery			0	0	4	0	3
Battalion			3	2	0	0	0
Battery			0	2	4	1	0
Platoon			0	3	3	2	1
Section			3	1	2	2	7
Category	6.5.4	Detractors - Outside Requirements					
Division Artillery			0	0	1	2	1
Battalion			3	0	0	0	0
Battery			2	2	2	1	3
Platoon			2	1	3	0	2
Section			7	1	6	0	8
Category	6.5.5	Detractors - Repair Parts Availability					
Division Artillery			0	0	3	4	0
Battalion			6	2	0	0	0
Battery			0	1	1	0	0
Platoon			0	1	1	0	0
Section			0	0	4	9	5
Category	6.5.6	Detractors - Repair Costs					
Division Artillery			0	0	4	1	0
Battalion			1	0	0	0	0
Battery			0	0	1	0	0
Platoon			0	0	2	0	1
Section			0	0	0	0	0
Category	6.5.7	Detractors - Maintenance 63T					
Division Artillery			0	0	0	0	0
Battalion			1	0	0	0	0
Battery			0	0	0	0	0
Platoon			0	0	0	0	0
Section			0	0	0	0	0
Category	7.0	TRADOC Training Support Products - General					
Division Artillery			0	0	0	2	3
Battalion			0	0	0	0	0
Battery			0	0	0	3	1
Platoon			0	0	1	5	4
Section			0	0	1	6	2

		Site				
		1	2	3	4	5
Category	7.1 TRADOC Training Support Products - School Graduates					
Division Artillery		0	0	4	2	0
Battalion		0	0	0	0	0
Battery		1	0	2	0	0
Platoon		1	0	0	0	0
Section		5	2	0	1	0
Category	7.2 TRADOC Training Support Products - ARTEP MTP					
Division Artillery		0	0	0	0	0
Battalion		1	1	0	0	0
Battery		0	0	0	0	0
Platoon		0	0	0	0	0
Section		0	0	0	0	0
Category	7.3 TRADOC Training Support Products - Other/New Products					
Division Artillery		0	0	1	1	0
Battalion		2	0	0	0	0
Battery		0	0	3	0	0
Platoon		0	0	3	0	0
Section		5	3	1	0	0
Category	7.4 Training Support Products - Other					
Division Artillery		0	0	0	0	0
Battalion		3	0	0	0	0
Battery		0	0	0	0	0
Platoon		0	0	0	0	0
Section		0	0	0	0	0
Category	8.0 Command Support					
Division Artillery		0	0	5	4	0
Battalion		0	0	0	0	0
Battery		0	0	0	0	0
Platoon		0	0	1	0	0
Section		0	0	0	0	0

APPENDIX E

SUMMARIES OF ANECDOTAL DATA EXTRACTS BY SITE

This Appendix contains summaries of anecdotal comments made by interviewees during site visits to the MLRS units. The summaries were developed as part of the content analysis process to integrate information from the 98 interviews with other pertinent information on similar topics[1]. These summaries pertain to a wide variety of specific topics addressed by interviewees; however, they are for the most part concerned with details regarding training guidance to units, the conduct of training by units, training resources, and performance evaluation. They are provided for the interested reader who wishes to inquire into the rich variety of opinion on a wide range of issues that resulted from the interviews. The summaries here should be thought of as a supplement to the results presented in Section 3 of the body of this report. Summaries are presented by site, as follows:

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[1] The author's appreciation is expressed to Jerome R. Noss, Ph.D., who provided valuable services in preparation of the summaries for MLRS Separate Batteries.

Site 1

Training Guidance

The training guidance provided to this Battalion by Corps and Brigade is general in nature. Corps and Brigade level guidance identifies broad areas of focus in which the Battalion Commander is expected to train. The Battalion develops its own Mission Essential Task List (METL) from the general goals and guidance provided by higher echelons. The Battalion's parent Brigade approves its METL.

The Battalion Commander provides annual and quarterly training guidance to his subordinate Battery Commanders. The Battery Commanders, in turn, develop METLs for their batteries and the subordinate echelons. The Battalion Commander approved METLs for the Batteries.

Annual and quarterly training guidance to the Batteries from the Battalion Commander in fiscal year 1990 emphasized training to the Batteries' METL, with an emphasis on preparation for the Battalion Field Training Exercise (FTX) and a planned Firepower Capabilities Exercise (FCX). Effective utilization of Sergeant's time (a feature emphasized in this unit) was also stressed for both individual and collective training at the Section echelon. In early 1990, this Battalion was involved in a major Operational Test and Evaluation (OT&E) event. Preparation for and participation in this event occupied several months' time for the entire Battalion. The Battalion Commander placed major emphasis on good performance in this activity. Concurrently, he stressed this as a means to develop and reinforce METL-related skills and capabilities.

In this Battalion, METLs have been developed down to the section echelon. The METLs are articulated from echelon to echelon. That is, the METL tasks of lower echelons are based on the METL tasks of higher echelons, as prescribed by FM 25-100. The tasks on all of the METL documents that were examined correspond to named collective tasks in ARTEP 6-398-30-MTP.

Battery Commanders solicit training needs from Platoon echelon personnel during weekly training meetings. Platoon level personnel in turn get input on training needs from their Sections. Effort is made to integrate the stated training needs from lower echelons into the Battery training schedules. These training schedules are the main training guidance provided to Platoons and Sections.

Training Resources—Availability and Adequacy

Anecdotal comments regarding training resources that were made during the interviews include the following:

- 108 rockets per Battery per year were cited as enough to maintain proficiency; the respondent would not ask for more or care to have to do with fewer. Another respondent stated that shooting more rockets would result in better Section level proficiency.

- Land availability at this post is a problem for deploying a full Battalion, but not for deploying a Battery. There is simply not room here to deploy an MLRS Battalion according to doctrine. Land availability was also cited as a problem with land

navigation training—the limited amount of space is quickly learned by soldiers and is then not a challenge from a navigation standpoint.

- Only three firing points that can be used for MLRS live fire are available on post. These are within 250 meters of each other. This makes it impossible to conduct live fire under conditions similar to MLRS doctrinal deployment.

- The small arms ammunition allocation to the Battalion is insufficient to support weapons qualification at the level of turnover experienced, given that all personnel must be qualified on their individual weapons. About 125 - 130 percent of the basic small arms ammunition allocation was needed last year for qualification purposes.

- Qualification ranges for some small arms (i.e., LAWs, M2 machine gun) are not available at this site. Also, the Battalion receives a consistently low priority on the use of the small arms ranges that are available on post.

- The Battalion had to develop its own evaluation materials for Batteries and lower echelons—no ARTEP MTP was available to use as an evaluation guide and standards. At lower echelons, the ARTEP MTP was cited as impossible to obtain (in January 1990).

- A shortage of manuals and trainer's guides was reported in several different interviews.

- Night vision devices are reported in short supply; the Battalion has less than 20 percent of the night vision devices authorized. This makes it difficult to train at night.

Training Conduct

Battalion staff stated that their goal is to conduct a one-week Battalion-level FTX once each quarter and a Battery-level FTX combined with a Live Fire Exercise (LFX) for each Battery once per quarter, as well. This goal had not been met over the six months prior to the site visit; the most recently scheduled Battalion FTX was cancelled, and a Command Post Exercise (CPX) conducted instead. As mentioned above, this unit was involved in a major OT&E activity during the months of March and April; this probably accounts for there being no field training events scheduled during that time. It was noted that many of the training requirements for this unit derive from higher echelon taskings to support test and evaluation events of this sort. Such taskings were reported to cause many short-and long-term training schedule changes for the Battalion.

The Battery-level quarterly FTXs are not part of a scenario-based exercise. Rather, they begin with one day of live firing. After live fire is completed, the Battery uses the remaining time in the field to work on training needs as determined by the Battery Commander. Several comments indicated that lower-echelon leaders and soldiers would like to have more frequent FTXs at the Battery level—a monthly FTX of at least 3 days' duration was mentioned in at least two cases as desirable. Live firing was not seen as necessary during each of these proposed more-frequent FTXs. Live fire exercises are presently conducted between 1700 and 0600. During the LFX, each Battery

establishes three firing points (all there are at this post) and three hide points per firing point. Platoon leaders select which Sections will fire which missions at a given time, based on launcher crew proficiency. It was reported that the more proficient crews may be assigned more difficult missions, including simultaneous missions, or a two- or three-target fire plan.

Ammunition Platoon personnel stated that they attempt to use time during FTXs in as realistic training as possible. These personnel stated that they attempt to manage ammunition handling during the FTX as though they were establishing a Local Dispersal Area (LDA) supporting Battery operations.

The only Battery-level training occurs during the quarterly FTX/LFX. Several comments indicate that personnel feel the amount and quality of training actually performed in the Battery FTX/LFX is less than is desirable. Longer exercises with more emphasis on realistic (i.e., doctrinally correct) scenarios were suggested.

A stated Battalion goal in live firing is for each launcher Section to fire three missions using different firing methods (one rocket per mission). One rocket is fired as a Time-on-Target, one as "At my command," and the third as a "When ready" mission.

The Battery METL is used to focus training at the Battery echelon and below; this unit has developed METL down to the firing, ammunition, and Battery Headquarters section levels. Battle Drills have been developed and are used for Section level training, emphasizing critical tasks under the Battery and Platoon METLs (for the Firing Section, Battle Drills are: launcher start-up, calibration, reload, occupy a firing position, and perform a fire mission).

Sergeant's Time is held each Wednesday for Section level training combined with individual task training. Training content during Sergeant's Time appears to focus on Battle Drills; Nuclear, Biological and Chemical (NBC) task training; and fire mission processing. Sergeant's Time was cited by one Section Chief as the only "quality" training time for the Sections, except training time during the Battery quarterly FTXs. Conversely, other Section-level personnel in both Firing and Ammunition Platoons thought Sergeant's Time training is too repetitive and too focused on the Battle Drills. They wished for more freedom to train their Sections as they perceive the need. Personnel in one Ammunition Platoon reported that their Platoon goes to the Local Training Area (LTA) at least once a month to practice loading pods (LP/Cs) onto their trucks and trailers, and tying-down the pods.

Firing Sections were reported by several personnel to train on reload tasks with members of the Ammunition Platoon frequently. However, other personnel stated that reload task training is concentrated during the month or two prior to the annual SQT for MOS 13M personnel.

NBC task training was cited as conducted frequently during Sergeant's Time; however, some personnel reported that their Sections had never performed a Hasty Decontamination task.

Training Strategies, Methods, and Techniques. The Battalion's emphasis was stated to be on decentralized training. This reflects the decentralized nature of MLRS doctrine and tactical employment. The Battery Commanders should have discretion on how to train and to obtain the most training value from each training event and each training rocket fired. This is not prescribed by Battalion.

Battalion-level personnel stated that the following are advantages to live-fire training over dry-fire:

- Live firing demands attention to detail that can be overlooked in dry-fire training.
- Live fire builds crew confidence in the MLRS system.
- Live fire can be used to teach ammunition management; i.e., firing so as to obtain balanced pods; dry fire cannot do this.
- Live fire causes real-world breakdowns and problems that crews cannot learn to deal with in a dry fire scenario.

Battalion level personnel also stated a desire to be able to conduct longer-duration live-fire exercises integrated into scenario-driven FTXs. It was noted that training this way at Site 1 would require the availability of practice rockets with a much smaller surface safety zone than those now in use (land area was cited as a resource constraint earlier).

At the Battery level, the following training strategy and methods comments were obtained:

- Cross-training for Firing Section members happens naturally; Section Chiefs feel a responsibility that everyone know other crew members' jobs.
- A useful training motivator would be a "Best by Test" competition; this Battalion currently does not conduct such a competition.
- There is a great deal of variability in whether 'hip-pocket' training is actually accomplished, and the quality of the training that happens when it is done. There has been a Battalion-wide emphasis on being ready to take advantage of slack time in order to train, but it has not been altogether effective.

At the Platoon level, several comments on training strategies were made:

- NBC training is used as an opportunity to reinforce other tasks; soldiers are required to perform their normal tasks under the required Mission-Oriented Protective Posture (MOPP) conditions.
- Most Section-level training is hands-on, performance oriented training for launcher crews and ammunition section members. This is the best way to train Section-level tasks.
- New or inexperienced soldiers are paired with experienced soldiers where possible (in both Firing and Ammunition Sections), to help along the "lessons learned" process.

- More cross-training between Firing Section and Ammunition Section members should take place (although Battalion-level personnel stated that this cross-training was emphasized).

- Existing METL and Battle Drills are good training tools, particularly now that the ARTEP MTP is available to use as a source for task performance standards.

The following observations summarize comments at Site 1 at the Section level regarding training strategy and methods:

- More realistic scenarios are needed for effective training and retention. This might be done by having longer, more intense FTXs. A longer exercise would allow practicing some leadership tasks that cannot now be practiced (with the shorter FTXs): developing and implementing sleep plans and other tasks required in sustained combat. One Section Chief expressed that each Section needs at least seven days per quarter in the field in order to train to combat readiness.

- Some feeling was expressed that training plans may be event-driven; i.e., more intense task-oriented training before an SQT. It was pointed out that many crew member tasks are not on the SQT task list, and that training on these tasks is also needed to develop a combat-ready crew.

- Firing Sections generally train as sections, but separate from the remainder of their Platoon. No comment on the value of this as a method was made.

- The best training for Ammunition Sections may not be as independent Sections, but as part of Platoon training. This enables training on the command and control tasks and elements of performance. However, it was stated that most Ammunition Section training at Site 1 is independent of the Platoon headquarters element; i.e., as Sections.

- "Hip-pocket" training is done during otherwise idle periods. However, what is trained and the quality of that training vary widely, depending on the training skills and motivation of Section Chiefs.

- Having to plan training four to six weeks in advance places some limitations on what Section Chiefs can do in the present to deal with performance deficiencies and training needs of their people. One Section Chief stated that more control over what he trains on "this week" would improve his Section's proficiency, since he could determine what to train on in the short term, rather than being bound by the battery training calendar.

Training Scheduling. Batteries in this Battalion determine their own training schedules, within guidance and direction by the Battalion Commander. A typical Battery training calendar (during in-garrison periods) includes weekly scheduled events that are more or less permanent, as well as changing training content (nominally) based on inputs from lower echelons. More or less permanent features of the Battery training calendars examined include:

- Monday: Command Maintenance
- Wednesday: Sergeant's Time (Section-level training; six hours normally scheduled)
- Friday: Maintenance and communications training.

Tuesdays' and Thursdays' training content is nominally to be devoted to individual task training, based on training needs stated by Section Chiefs, if no other taskings, details, etc. are required. It was stated that individual training is seldom scheduled on these days, since the Battalion always has plenty of external commitments to meet.

Several Section Chiefs commented that they felt that their inputs on training needs seldom were acted on (i.e., appeared in the training calendar).

Performance Evaluation Techniques

Formal external evaluations of this Battalion and its Batteries were reported not to have taken place during the last 18 months. The Battalion Commander has attempted to make use of test and evaluation events to assess the proficiency of the Batteries, but has had little control over the assessments that take place. Most evaluation of the Batteries' collective task performance has been from an internal standpoint. Battery commanders provide their assessments of proficiency to the Battalion S-3, who compiles this information for the Battalion commander.

Battery commanders report that they use the quarterly FTXs as "internal ARTEPs" to assess their Platoons' and Sections' performance and identify deficiencies. The identified problem areas form the basis for training plans for the subsequent quarter. One Battery commander stated that he used the Platoon and Section METLs and TC 6-60 as evaluation guides, and developed and conducted After Action Reviews (AARs) of Section and Platoon performance after each exercise. No mention of using ARTEP 6-398-30-MTP as an evaluation guide was made.

Members of one of the Batteries reported that their Battery conducts a "Best-by-Test" competition occasionally as a diagnostic and a motivational tool.

As regards individual performance, it was reported that most Section Chiefs use Job Books, SQT scores, and CTT scores as diagnostics for what training their Section members require. The results of safety certification tests are also reported to be used as a diagnostic and individual performance evaluation method. Several Section Chiefs reported that they use observation of performance during Sergeant's Time to evaluate individual performance and diagnose training needs for their Section members.

Examples of documents related to performance evaluation were provided by Battalion personnel, and examined. These included:

- Checklists at Battery, Platoon, and Section echelons, based on METLs (the checklists were task-level GO/NO GO)
- Safety certification performance evaluation guides (quite detailed checklists, task by task)
- A safety certification written examination for Firing Section personnel (also quite extensive)
- An AAR debriefing checklist used by one of the Batteries (this was organized by functional area rather than MTP task)
- A schedule for one Battery FTX (a general timeline; lower echelon tasks were not identified on this document).

Except for the METL-based checklists, none of these documents was articulated with the MLRS ARTEP MTP tasks for any echelon. This may be related to the reported unavailability of the MTP until very recently.

Site 2

Training Guidance

The training guidance provided to the MLRS Battalion at Site 2 from Corps is very general in nature. The Battalion is directed to develop its own METL, and to train as necessary to develop proficiency in the METL tasks.

The Battalion is reported to have developed Battalion and Battery METL, and provided this as guidance to the Batteries. No examples of METL below Battalion echelon were included in the documentary data obtained at Site "B." The Batteries are tasked with developing critical task lists for Platoon and Section Echelons, and training as necessary to develop proficiency and mission readiness in those tasks. Supplementing this general guidance, the Battalion Commander provides the Batteries with annual and quarterly training guidance of a more specific nature.

Highlights of the Battalion Commander's training guidance to Battery Commanders for Fiscal Year 1990 include the following:

- Emphasizes mission-essential, go-to-war task training as the highest priority.
- Lists the Battalion METL (the tasks listed have titles different than MTP titles).
- Emphasizes Section-level training and developing the capability to operate independently as Sections in accordance with the doctrine for MLRS employment.
- Provides four "Imperatives in Training:"
    - Maintain small-unit (i.e., Section) integrity, and make training the priority; details and other detractors should take a lower priority. Emphasize teamwork.
    - Prepare leaders to teach; develop NCOs' skills as instructors.
    - Make every event a training event; have hip-pocket training ready.
    - Train to standards. Use performance-oriented training methods and have clear statements of tasks, conditions, and performance standards.
- Re-emphasizes training to standards. Provided TC 6-60, ARTEP 6-398-30-MTP, and command policy letters as examples of sources to use for standards.
- Emphasizes the development of fundamentals from the lowest echelons up (included mention of numerous specific areas of emphasis).
- Discusses who should be the trainers and evaluators at each echelon. Specific emphasis is given to Section Chiefs' role as the primary trainers for individual and Section level collective skills.

- Emphasizes the need to plan training ahead at lower echelons, in an effort to build competency for higher-echelon training events.

- Specifies that Battalion assets (Tactical Operations Center, Ammunition Supply Points) will be provided in support of Battery-level training, to provide higher echelon functions needed to train realistically.

- Re-emphasizes the need to plan training ahead, building up to higher echelon field exercises.

Supplementary quarterly training guidance for the second quarter exhorted Battery Commanders to become more active in developing the training focus for their units, and to be more fully involved in planning for both field and garrison training. Standards in training were re-emphasized. Specific training priorities for the quarter were outlined, and specific goals were set forth for Headquarters sections and the Batteries. Of interest are the specific goals for the Batteries:

- Train to the goal of 80 percent of "when ready" fire missions actually fired within five minutes in dry-fire training, and 50 percent fired in under six minutes in live-fire.

- Conduct more than 50 percent of field training in reduced visibility conditions.

Battery training guidance to Platoons was reported to be a restatement and re-emphasis of the Battalion Commander's training guidance, along with supplementary verbal instructions and guidance to Platoon Leaders and Platoon Sergeants, in one Battery. No information about training guidance in the other two Batteries was available.

Platoon guidance to Sections was reported in one case to be providing task performance criteria to the Section Chiefs, who are expected to use these criteria in their Section-level training.

Training Resources—Availability and Adequacy

Anecdotal comments regarding training resources that were made during the interviews with Battalion-level personnel are:

- At this site, a Battery can deploy to doctrinal distances for dry fire training, but the Battalion cannot. There is not enough land available for the Battalion to deploy in accordance with doctrine. The Battalion as a whole should be able to go to the National Training Center (NTC) where it would have enough land to deploy properly. No elements from this Battalion have ever been to the NTC. (Land availability and adequacy was also mentioned by respondents from Battery, Platoon, and Section echelons.)

- Twelve rockets per launcher per year is the absolute minimum that should be allowed for live firing. Any fewer than this number will result in severe deteriorations in performance. At least this number is needed to build crews' confidence in the launcher systems. More rockets would be better, then more realistic stresses could be placed on both systems and people during training.

- The high turnover rate in this Battalion causes needs for more small arms ammunition for weapons qualification than is budgeted. An example—there are 50 soldiers equipped with the M203 grenade launcher in the Battalion. The 40-millimeter ammunition allocation last fiscal year was 235 rounds. Twenty-one rounds are required to qualify a soldier with this weapon (three for zeroing, nine for the pre-qualification course, and nine for the actual qualification firing). With this amount of ammunition, only 11 soldiers per year can be qualified on this weapon. (Small arms ammunition availability was also mentioned by respondents at the Section echelon.)

Comments on training resources from lower echelons:

- There is intense competition for training land at this site. MLRS always seems to get a low priority for land use, and frequently gets "bumped" from use of land by units with higher priority. When land is available, however, it seems to be adequate for Battery level training.

- More time to train is needed. Too much time is taken up with other activities. Also, a train-the-trainer program to prepare NCOs to be effective teachers is needed (Battery echelon).

- There are no training materials available to enable practicing emergency destruction of ammunition. The unit has made a simulator out of clothesline (for detonating cord) and blocks of wood (to simulate C-4 explosive blocks). More frequent actual demonstrations with live explosives, and a chance to practice with "the real thing" would improve proficiency in this task (Platoon echelon).

- The limited number of available training areas at this site means that the geography of the areas is easily learned after only a short while. This removes the challenge from land navigation and practicing doctrinal deployment, because soldiers are seldom in an unfamiliar area. The respondent suggested exchanging unit personnel with an MLRS unit at another post, to provide some novelty in terrain (Section echelon).

- Multiple Integrated Laser Engagement System (MILES) is hard to come by, and is needed to practice local defense tasks when aggressors are used (Section echelon).

- It is difficult to get the equipment to practice hasty chemical decontamination tasks. This means that the task cannot be practiced as frequently as it should be. There is only a limited amount of equipment in the Battalion, and the Batteries have to compete for it (Section echelon).

Training Resources—Utilization

Personnel at the Battalion echelon stated that rockets are never ripple-fired during live fire training in the Battalion. All firing is single shot. The reason for this policy is that it is believed to provide the most training value per round fired. Each rocket firing is treated as an independent fire

mission, including movement from the hide point to the firing point, firing, and relocating to a new hide point.

Attempts are made to use MILES equipment and aggressors on some field training exercises, to provide local defense training for Battalion and Battery headquarters personnel and, occasionally, Firing Section personnel.

Training Conduct

This Battalion's verbally-stated field training objective is to conduct quarterly Battalion FTXs, and get each Battery to the field five to seven times per year for at least a week. Battalion staff members stated that Battalion-level FTXs were scheduled during January, February, and April of 1990 (whether these exercises actually were conducted is not known). Battery-level FTXs were conducted in the months of July, August, September, October, and December in 1989. The exact Batteries involved in those exercises are not known. A Battalion staff member reported that there were 191 training days spent in the field in Fiscal Year 1989—which echelons spent what amounts of time in the field was not reported.

Several operations orders for Battery-echelon FTX/LFXs were provided as documentary material at Site 2, as well as an operations order for a Battalion FTX. The Battalion-level order was highly detailed in terms of timelines, units involved in specific activities, and Battery-level tasks to be performed. The Battery-level orders were less detailed, both in terms of timelines and activities, and the involvement of lower echelons in specific activities, than was the Battalion order. In the Battery-level orders, for example, Platoon "objectives" were called out for the exercise as a whole, but these did not extend to naming ARTEP tasks that were to be performed, nor to providing performance standards.

Further Battalion-echelon anecdotal descriptions of MLRS training at Site 2 included the following points:

- The Battalion held a Battalion CPX in 1989, involving all echelons down to Platoon level. This exercise exercised the Battalion's METL tasks, was scenario-driven, and performance was evaluated against ARTEP standards. Tasks trained in this exercise included planned and unplanned fire missions, changes of mission, development of fire plans, intelligence gathering, and NBC tasks. It was stated that the Battalion Operations and Intelligence staff personnel spent over 300 hours preparing this exercise. (No documentary information describing the exercise was provided.)

- The Battalion has been involved in some training with other Field Artillery units. These included a Corps-level CPX, another CPX as part of a train-up for an event (in which the Battalion did not participate), and an amphibious deployment exercise.

- The Battalion's training emphasis is in line with the doctrinal employment of MLRS—as partly autonomous Batteries, Platoons, and Sections. Independent training of tasks at all echelons is encouraged, to build the skills needed to fight under doctrine. Emphasis is therefore placed on Section-level skills emphasizing

the ability of the launcher Sections to operate autonomously. Emphasis is also placed on land navigation skills to support successful autonomous operations. Section Chiefs are the primary trainers, and are responsible for developing the skills needed in their personnel. However, one Battery Commander stated that a much more effective train-the-trainer program is needed to prepare Section Chiefs for this role.

- The Battalion Tactical Operations Center (TOC) goes to the field with each Battery during live fire exercises and FTXs, to provide appropriate higher echelon command and control and logistic play needed for successful training of the Battery.

- Since Platoons operate autonomously, Platoon Leaders should receive training in coordination with other friendly forces in the Platoon Area of Operations. Battery Commanders should be responsible for this training.

The following anecdotal information on training conduct was provided by personnel at the Battery echelon:

- One Battery Commander stated that Batteries train together only during FTXs. Other lower-echelon field training consists of one-day Platoon Situational Training Exercises (STX). However, another Battery Commander stated that his Platoons never train in the field as Platoons. This was attributed to the Battalion's (sic) emphasis on Battalion and Battery level field training—there is no opportunity for Platoons to train independently.

- One Battery reported that it trains in the field as a Battery about once a month, for an average of five days. A Platoon Leader from another Battery stated that his unit gets to the field about twice a month for three or four days at a time.

- It was stated that Battery FTXs are METL-oriented and driven by prepared scenarios (who prepares and executes the scenarios was not stated).

- Approximately two-thirds of field training in a given quarter is Battery level training; the other third is field training as part of Battalion exercises.

- Thursday and Friday of each week (in one Battery) are devoted to Platoon- and Section-echelon training. The exact content depends on the needs of the specific unit(s) involved.

- One Platoon Sergeant stated that only in the last eight months or so have Battalion-level exercises been scheduled. Previously, all field training was Battery-oriented.

The following comments were made by personnel interviewed at the Platoon echelon:

- One of the Batteries does not schedule Sergeant's Time weekly, or Common Task training (the previous Battery Commander "didn't believe in it"); the other Batteries do schedule Sergeant's Time and individual task training. One Battery schedules Sergeant's Time for two hours and 45 minutes on Friday morning. The other

schedules one hour on Mondays (times are derived from examination of Battery training calendars).

- Platoons in one Battery do not conduct Platoon-level field training, although a Platoon Leader stated that he would like to be able to do so. Platoons in another Battery do conduct one-day Platoon-level STXs. A Platoon Leader stated that on "STX days" his Platoon gets only four to five hours of effective training time because of the amount of time needed to recover and clean up equipment.

- In at least one Battery, the Ammunition and Firing Platoons cross-train during Sergeant's Time. A Section Chief from another Battery reported that there was almost no Ammunition-Firing Platoon cross-training taking place in his unit; he suggested such cross-training as a good idea.

- Most NBC training is done in garrison. Only when an ARTEP is scheduled does NBC training move to the field. However, a Section Chief reported that his Battery practiced hasty decontamination tasks almost every time they went to the field.

Section-echelon comments included the following themes:

- Shorter FTXs (three days instead of seven to ten; presumably referring to Battalion-level FTXs) would be more useful from the standpoint of Section-level training. There would be less wasted time.

- Most field training concentrates on fire mission processing. There is little time to train on other Section and individual tasks in the field. Sections do not go to the field except as part of higher echelon exercises.

- Most SQT and CTT training emphasis occurs just prior to the dates when the tests are scheduled; little training emphasis is placed on these tasks otherwise.

- Training emphasis shifts to the METL tasks before a scheduled ARTEP (the individual did not say what the emphasis was at other times).

Several lesson plans identified as being from the MLRS AIT course were included in the documents gathered at Site 2. No information came to light on how these plans might be used in training within the Battalion.

Training Strategies, Methods, and Techniques. The Battalion Commander stated that his training emphasis is on Section-level skills, with the Section Chief being the primary trainer for all individual and crew skills. Since MLRS doctrine relies heavily on the Section Chief for mission execution, the Chief should also be responsible for developing his Section's skills. It was reported that Section Chiefs are even responsible for meeting all parameters in live fire training; no checkers are used at firing points in this Battalion, as they are in some other units.

The following training strategy and methods observations were made at the Battery echelon:

- To prepare leaders to conduct NBC training, personnel down to the Section Chief level have been sent to Fort McClellan to undergo live agent chamber training. The purpose of this is to motivate NBC training and reinforce the importance of training to perform in NBC conditions. No indications were given of how widespread this practice is within the Battalion, however.

- In a related area, one Battery has managed to send several NCOs to Camp LeJeune to train as marksmanship instructors.

- The Battery First Sergeants and Platoon Sergeants are responsible for preparing the primary trainers (Section Chiefs) to be effective teachers and trainers. For at least one Battery, it was reported that the train-the-trainer job is not done well. This perception was also stated several times in interviews at the Platoon and Section echelons.

- Cross-training between members of the Ammunition and Firing Platoons is reported to be a frequent practice in two of the Batteries, but seldom conducted in the third.

- At least one Battery Commander uses ARTEP 6-398-30-MTP as a training guide, reportedly with good results.

- Individual task training is conducted during Sergeant's Time in two of the three Batteries, on a weekly basis.

- The Battalion and Batteries conduct Best-by-Test competitions for Sections. Battery test results are used to select the crew that competes in the Battalion competition. This is perceived by those who mentioned it to be a performance motivator (although there was no indication that any tangible rewards are associated with being best).

Examination of Battery training calendars showed that one Battery Commander designates specific common, MOS-related, and hip-pocket training tasks on a week-by-week bases. MOS-related tasks are designated for MOS 13M, 13P, and some of the low-density MOS. At least one common task and one hip-pocket training task were designated on each of this Battery's weekly training calendars, as well.

These statements on training strategy and methods were made by personnel at the Platoon echelon:

- Much of the crew-level task training is done in the motor pool. The value of this training is not high because it does not put the crew in a realistic environment. The same comment was made for ECCM training.

- Platoon-level personnel in one of the Batteries do not conduct Platoon-level STXs, but wish that they could do so.

- There is great variability in Section Chiefs' capabilities as trainers. Some Section Chiefs seem to have a tendency to train to the least apt or skilled soldiers. This makes training for more skilled soldiers boring and repetitive.

- Personnel in at least one Battery emphasize cross-training among members of Firing Sections.

- Ammunition Platoon and Firing Platoon cross-training is conducted in at least one Battery by exchange of equipment between the Platoons during Sergeant's Time. The Section Chiefs from both Platoons involved accompany the equipment and serve as trainers. Some additional cross-training is conducted by members of one Battery when equipment goes down in the field. The driver and gunner of a "down" launcher are sent to the Ammunition Platoon to learn tasks associated with jobs there. The Section Chief is sent to Platoon Headquarters with the objective of learning parts of the Platoon Sergeant's job. Personnel at the Section level in one Battery reported that they very seldom cross-train with their Ammunition Platoon.

- Noting that training the same launcher-oriented tasks repeatedly becomes boring, members of one Firing Platoon reported that they occasionally perform some Infantry-type tasks (i.e., infiltration, assault), using MILES equipment, during field exercises.

A Platoon Leader's handbook was included in the documentary material gathered at Site B. This handbook includes Standard Operating Procedures (SOPs), orientation material, and Battle Drills for the Platoon Headquarters, Firing Sections, and Ammunition Sections. How this document is used, or by whom it was developed, was not identified in any available information.

The following comments on training methods were made at the Section level:

- Training in the motor pool is only valuable for fixed procedures, like fire mission processing. For anything else, field training is needed to get the real world situation, problems, and contingencies.

- Cross-training within the Firing Section is essential so that everyone knows everyone else's job.

- From the Firing Section point of view, field training is of equal (high) value no matter what echelon level exercise the training is embedded in. That is, the Section can train effectively as long as they have at least one higher echelon available to provide command and control functions. In contrast, personnel in one Ammunition Platoon stated that they had little time to train while in the field; their people are used to perform administrative and security, rather than resupply, functions during exercises.

Training Scheduling. In this Battalion, Batteries develop their own training schedules, which are approved by Battalion. The Battalion Commander's guidance is supposedly incorporated in Battery training schedules. The goal is to plan and schedule training five weeks in advance, so that resources needed to train can be acquired. Personnel in each of the Batteries reported that weekly training meetings are used to develop training schedules. Participants include all echelons from the

Section Chiefs to the Battery Commander or Operations Officer. In one Battery, Section Chiefs identify training needs and pass their requests for topics or tasks to be included in the training schedule to their Platoon Sergeants. The Platoon Sergeants then attend the training meetings and relay the requests to Battery echelon. In another Battery, Section Chiefs attend the training meetings and provide their input directly to Battery personnel. Section Chiefs base their training requests on areas of weakness in the performance of their Section personnel, including both individual and collective tasks. Individual task training and collective task training appear on the training schedules. In two of the Batteries, Sergeant's Time is scheduled weekly, as noted above.

Training scheduling in this Battalion is constrained by the Mission/Training/Support cycle discussed above. Therefore, Batteries do not schedule field training during the portion of the training cycle when a Battery has a deployment mission commitment. One Platoon Leader remarked that even though they cannot go to the field during this time, training continues in garrison. A Battery Commander remarked that in-garrison training also continues during the Support portion of the cycle, since all the Battery's troops are seldom committed to support tasks at once.

Performance Evaluation Techniques

At Battalion echelon, it was reported that ARTEP MTP standards are used for evaluating the collective-task performance of Batteries and subordinate echelons. Reportedly, After Action Reviews (AARs) are conducted on a daily basis during field exercises, as well as after critical events (nature unspecified). The AAR notes are used to compile lessons learned, which are reportedly distributed across the Batteries. No documentary data were provided to support these verbal reports.

Within the Battalion, it was stated, Batteries are externally evaluated by members of one of the other Batteries, supplemented with Battalion Headquarters personnel. Documentary data gathered at this site included scenarios for both Battery and Platoon external evaluations. The scenarios were very detailed in terms of the tasks to be evaluated, timelines, and performance standards. The tasks and standards that appeared on the scenarios correspond to Battery and Platoon tasks and standards published in ARTEP 6-398-30-MTP.

For individual-task evaluation, it was reported that CTT scores, SQT scores, and individual weapons-qualification scores are maintained at both Battalion and Battery echelons. This is certainly the case for Battalion, where SQT scores were provided to the study team by the S-1. It was stated that these scores are used as diagnostics for specific soldiers and as aids in scheduling training.

Platoon Sergeants reported observing Firing Sections during field exercises as a performance evaluation approach. No information on the type of diagnosis or feedback provided was given. It was mentioned that the task performance criteria provided in ARTEP 6-398-30-MTP are used for evaluation at the Firing Section echelon, during Field Exercises.

Section Chiefs were reported to track Section members' individual task performance by using Job Books.

Task Performance Proficiency

Few anecdotal statements on performance proficiency were made in the interviews. The only statement of interest was made by the Battalion Commander, who stated that the average live fire mission in the Battalion is completed in under five minutes, from initial receipt of the mission at the Firing Section to actual rocket firing. Some fire missions were cited as being completed in under four minutes. This was compared to "other" MLRS units who were cited as still attempting to breach the "five minute barrier" for fire mission average completion. No corroborating data for either statement were provided.

Training Guidance

Training guidance provided by the Division to DIVARTY includes the scheduling of ranges for two 3-day MLRS live fires on the Division Training Calendar for FY 91. Guidance was provided by the Division to a previous MLRS Battery Commander for the development of a Battery METL. A lack of understanding at the Division level of MLRS training requirements is viewed as a constraint on further training guidance from the Division.

Training guidance provided by DIVARTY to the MLRS Battery is not well defined. The Battery is not mentioned in DIVARTY Training Guidance for FY 90. There is no specific DIVARTY policy on MLRS live fire and no evidence was found of a DIVARTY METL.

Training guidance provided by the MLRS Battery to the Platoons includes the Battery METL, Battle Tasks developed by a previous Battery Commander, and the Battery Training Schedule to which the platoons contribute.

Training Resources - Availability and Adequacy

Inadequate land space on post to support MLRS live fires and maneuvering requirements was cited as the major resource limitation at all echelons. Live fires require that the entire post be shut down, mainly on weekends. Range restrictions are intensified by the Red/Amber/Green training cycle which gives range priority to the Brigade "always in Green" over the MLRS Battery "always in Amber."

NTC is regarded as the best training area for MLRS at all echelons because the available space agrees with MLRS requirements. Section Chiefs with MLRS training experience at NTC agreed that it was the best training they had in CONUS.

The provision of 108 rockets per year for the MLRS Battery is generally regarded as adequate only if NTC rotations and demonstrations for visitors are not a requirement. An increase of 18 rockets for each Platoon on rotation to NTC was suggested along with an expressed need for improvements in support of MLRS units by NTC.

Inadequate time for training caused by DIVARTY detail assignments to the MLRS Battery was a consensus among Platoon and Section level personnel. Restrictions on vehicle operation was linked to interruptions of available training time and the impact on the Class IX budget caused by mechanical breakdowns.

Additional training resource constraints identified:

- Equipment destruction training kits
- Technical manuals
- Blank ammunition.

Training Conduct

The content of training is based on ARTEPs, SQTs, CTTs, unit SOPs, and METLs. Against this array of task descriptions and guidelines. the substance of a soldier's individual training is driven by his trainer's observation of his performance and the weaknesses that he demonstrates.

Individual training dominates the content of this unit's scheduled training time. For the 30 training days from 5 March 1990 through 13 April 1990, 267 scheduled training hours were distributed in the following proportions:

Battery Collective Training	.00
Platoon Collective Training	.06
Section Collective Training/Sergeant's Time	.12
Individual Training	.82.

Expressed as events and hours, this period includes:

Platoon Field Training	2 events, 16.0 hours
Section Training/Sergeant's Time	5 events, 32.5 hours
Individual Training	218.5 hours.

A priority on the maintenance of unit integrity is reflected in the requirement for attendance at individual training sessions where Platoons are scheduled to attend *as Platoons*. The Ammunition Platoon is not scheduled separately. Within this Battery the Ammunition Platoon Sections are assigned directly to the Firing Platoons to facilitate team and cross-training.

Training Strategies, Methods, and Techniques. DIVARTY regards major training events, such as REFORGER and NTC rotations, as the principal drivers of training strategy. When these events are on the calendar, MLRS Platoon and Section level training schedules are influenced months in advance of the event. The MLRS Battery is kept in an Amber training status so that support and training cycles can be rotated.

Land and range restrictions at this training site are managed by the Brigade S-3 who attempts to clear requested MLRS training areas upon request by the DIVARTY CO. Brigades scheduled for NTC deployment take command of all training resources in local training areas.

Division Capability Exercises (CPXs) are a series of local training events in which the MLRS Battery participates. When merged with the Battle Command Training Program (BCTP) the exercise functions like an ARTEP.

Battery level collective training has been scheduled to coincide with Brigades deployed to local training areas. MLRS platoons are positioned as they would be on the battlefield for two weeks of maneuvering and fire missions.

The MLRS Battery has developed, and uses, battle drills for:

- Firing platoons
- Fire Direction Center
- Ammunition Sections
- Firing Sections.

The task titles for these battle drills are the same as MTP tasks although Battery documents do not confirm the MTP as a reference.

Additionally, the Battery has developed a live-fire SOP containing conditions and standards which could be used as a training reference, and a pocket-size Field SOP which includes general procedures, a pre-combat checklist, and message formats.

The integration of firing and ammunition Platoon training was accomplished by disbanding the Ammunition Platoon and assigning an Ammunition Section to each Firing Platoon. As indicated above, this action facilitated cross-training and enabled the 13Ms to access directly both types of equipment on which they need to work. This innovative procedure at the battery level was viewed as an essential response to the organizational absence of a Battalion Commander.

The conduct of cross-training within the Sections was governed by the level of skill in the primary assignment. Platoon Leaders and Section Chiefs were in agreement that soldiers should be trained to standard in their primary tasks before spending time learning a backup or secondary role. Cross-training does occur regularly by rotating positions within the SPLL so that the Driver, Gunner, and the SPLL Chief each is familiar enough with all of the tasks to perform them should the operational situation require it.

Several techniques are used to overcome perceived weaknesses in task performance. Launcher and Ammunition Chiefs trade positions to work directly with soldiers during cross-training. Within Sections as well as during cross-training, it is a common practice to have a soldier refer to the appropriate manual to gain task familiarity prior to a step-by-step explanation by a trainer. Hands-on training and on-the-job training OJT are commonly regarded as essential training techniques to bring a soldier up to speed on a specific task.

Most of the individual training occurs during Sergeant's Time, a block of five hours scheduled for Thursday morning. While trainers prefer field exercises, the bulk of the training occurs in the motor pool. If operational readiness falls below 90%, there is a restriction on the movement of launchers whose breakdown would threaten the operational readiness posture.

None of the tasks required of firing or ammunition platoon personnel were considered difficult to learn or hard to perform. Problems with training on fire mission processing and communication were linked to maintenance rather than task complexity.

Training Road Maps, Sequence, and Hierarchy. There was no training plan in position for this MLRS Battery at the time this study was conducted. Battery personnel did not consider the existence of training calendars and schedules as a substitute for such a plan.

Training priorities placed SQT and CTT skills acquisition ahead of team and crew drills, Section training ahead of Platoon and Battery training, and field training as a preferred environment over garrison training.

Training Scheduling. The Battery Training Schedule reflects DIVARTY policy and Platoon inputs. Live fire exercises are always scheduled by DIVARTY which also gives direction to the Red/Amber/Green cycle. Current policy dictates that MLRS is always in Amber except during a Division exercise. Training for critical tasks occurs when Platoon Leaders and Platoon Sergeants develop their training schedule preferences and acquire Battery support to have it included on the Battery Training Schedule.

Thursday morning is reserved for Sergeant's Time during which one particular training requirement is scheduled. That requirement might be battle drills, integration of Platoon and Section level training, training the trainers, or any other designated training activity but once it appears on the schedule it will occupy the entire morning from 0730 to 1145. This scheduling practice is consistent throughout the Division.

Personnel Involved in Training. The Battery Commander and Platoon Leaders are responsible for training plans but gather inputs through the chain from the Section Chiefs and Platoon Sergeants.

The First Sergeant is responsible for individual training in the Battery and carries out that responsibility through the Platoon Sergeants.

All personnel within the Battery have a responsibility for the execution of training, but organizationally it is the Platoon Leaders, Platoon Sergeants, and the Section Chiefs who are specifically tasked within the Battery to make training happen.

Training-related appointments such as Driver Training NCO are made by the Battery Commander as required and subject to the availability of qualified people.

Actual Time Spent Training. The lower the echelon the greater the feeling that actual training time was inadequate to the realization of training objectives. Field exercises are considered essential to effective training but the Battery has gone to the field only once during the past year. Section training as part of Platoon training has happened less than ten times in the past 18 months. Limitations on training time and funds tends to restrict training to dominant tasks. Restrictions on the movement of launchers because of operational readiness or mechanical breakdowns is regarded as a major constraint on actual training time. Sergeant's Time on Thursday morning is considered the only time on the training schedule that is reasonably secure from DIVARTY details and tasking.

Performance Evaluation Technique

DIVARTY evaluates the MLRS Battery by its NTC performance or, lacking an NTC rotation, by the Battery ARTEP.

The Battery Commander and First Sergeant base their training program on personal observations of individual performances supplemented by briefings provided to the First Sergeant by the Section Chiefs. Before any live fire, the Section Chief and Gunner of each SPLL must pass a

verification test. DIVARTY "Pass" records, CTT and SQT scores, weapons qualifications, and the Section Chief's Job Books contribute to the evaluation of the Battery, Platoons, and Sections at the Battery level.

The Battery has developed Safety Certification Tests for:

- Platoon Leader/Platoon Sgt/Battery CO/Battery OO/FDC
- Section Chiefs/Gunners
- Ammunition Section Chiefs/ Asst. Section Chiefs.

Every position incumbent is required to pass with 80% correct or 90% if it is a retest. Certification is valid for one year or until there is a change of position by an individual. If a soldier changes position, he must pass the appropriate test for the new position.

Evaluation of the combined firing/ammunition Platoons by the Battery Commander was accomplished by the design of a 5-6 page test from items taken from the -10 for the carrier, -10 for the launcher, firing mission procedures, and safety diagrams from the TC 6-60.

Platoon Leaders and Platoon Sergeants evaluate Platoon performance by live fire demonstrations and, whenever possible, by FTXs. Platoon level Job Books are reviewed weekly and Platoon Leaders and Platoon Sergeants evaluate by personal observations during Platoon training sessions.

Platoon Leaders and Platoon Sergeants evaluate their Sections by observations of CTT training, adherence to ARTEP standards, SQT scores, and timing of various fire mission tasks.

Training Guidance

The Division Commander provides training guidance to DIVARTY in the form of quarterly and annual publications that focus on training goals and include the Division METL. Division policy on MLRS live fire is presented in a safety letter which makes DIVARTY responsible for all artillery fires regardless of who is training on this site. There is a Division range regulation in effect which includes a waiver for overhead fire. Division training exercises may assign an MLRS Platoon to Brigade Commanders to enhance their understanding of MLRS deployment. Division Command Guidance for FY 90 does not mention artillery in general or MLRS specifically and there are no MLRS notations on the Division Training Calendar.

The DIVARTY Commander provides training guidance in a manner similar to the Division; publications apply generally to all units without specific focus on MLRS. The Battery views DIVARTY training guidance as too general to be of value relying, instead, on the ARTEP, and the SQT predominantly. DIVARTY Command Guidance for 1Q FY 90 does not mention MLRS. The MLRS Battery does not appear on the DIVARTY Training Calendar although it should have carried DIVARTY related events appearing on the Battery Training Calendar. DIVARTY Command Guidance for 3Q FY 90 announced the Battery ARTEP and noted where the evaluation team would originate. A revised and approved METL was published.

Battery training guidance to the Platoons is correspondingly broad consisting largely of a long-range calendar and a statement of the Division training goals. Battery training meetings are held each week to review the calendar, discuss the METL, and adjust the schedule to prepare for the ARTEP planned for June 1990..

Training Resources - Availability and Adequacy

DIVARTY considers funding to be the major constraint on the availability of resources to support MLRS training, specifically as it relates to the participation of the Battery in training at NTC. Reference was made to the NTC package funded by FORSCOM which does not include MLRS. If MLRS is used as a force multiplier by the Division at NTC then it is the Division which covers the cost of MLRS involvement. Otherwise, training for the MLRS Battery at NTC comes out of the DIVARTY budget.

DIVARTY regards the MLRS unit as maintenance intensive and, consequently, very expensive particularly in comparison with a cannon Battery. Recognition of the value of MLRS as a force multiplier protects the Battery from budget cuts and qualifies them for supplemental funding as funds are available.

DIVARTY acknowledges their lack of MLRS expertise and the restriction it imposes on the evaluation of MLRS training, but points to the cost of going outside the Division for technical evaluation and the corresponding impact on available training resources.

DIVARTY is comfortable with the ammunition allowance of 108 rockets per year for the MLRS Battery in the belief that an opportunity to fire once a quarter is adequate to sustain

proficiency. They question the value of an additional allowance in terms of cost and training effectiveness.

The Battery is not in agreement with DIVARTY on the adequacy of 108 rockets per year. The provision of three rockets per section per quarter does not, in their opinion, satisfy the training requirement for live fire. No alternative figure was suggested.

Meteorological (Met) data provided by DIVARTY is used if it happens to be available but it is not requested on the assumption that acquisition costs would be prohibitive. Further support from DIVARTY was not identified by the Battery but the opinion was expressed that a lack of support from DIVARTY was the single biggest problem in the area of training resources.

Platoons responded to questions on the allocation of 108 rockets per year by indicating the number was inadequate because of turnovers in personnel. Citing the readiness rationale which states that all must have firing experience, they felt that live fire exercises were not held often enough to meet the readiness requirement.

Training aids generally were considered by Platoon Leaders and Platoon Sergeants to be adequate with the exception of an emergency destruction kit. Availability and distribution of manuals was regarded as a problem with the ARTEP and TC 6-60 being mentioned in particular.

Section Chiefs agreed that training resources were not a real problem, – that they had most of what they needed. The observation was qualified, however, by their expressed need for several training kits for emergency destruction, communications, Claymore mines, and additional monitors to conduct RAD surveys.

Training time, training areas, maintenance support, and a lack of parts were mentioned collectively as shortages that interfered with training, but none of these can be classified as majority opinions.

Training Conduct

The content of training for this MLRS Battery is driven by the ARTEP as the primary reference document, fire mission planning which originates at Battery level, and the trainer's emphasis on observed weaknesses. Additional training references include the SQT, Unit SOPs, TC 6-60, and the Mission Training Plan.

The concept of training plans to critically regulate the content of individual and collective training within the Battery structure is endorsed at the Battery level, but the development and implementation of such plans has not been effectively accomplished. The Training NCO, who is responsible to the Operations Officer for individual training, has been tasked as the Battery Secretary. The Battery ARTEP, theoretically the primary reference document, had yet to be planned. Integration of Section, Platoon, and Battery training suffers because of an apparent lack of input from lower echelons.

The Platoons agree that training content is governed by demonstrated weaknesses of individual and collective skills, but point to the infrequency of field exercises and the corresponding lack of

opportunity to train as fully integrated platoons. Much of the commentary by Platoon Leaders referenced activity at the Section level as the focus for examining the make-up of training activity.

Training in garrison centers on CTT and SQT skills and is predominantly Section level training. Section Chiefs in this Battery generally prefer field training for the quality of the training experience which it provides but contend with the alternative environment to work on individual performance, cross-training, and maintenance. Collective training is regarded as a Platoon training activity and is practiced as part of a field exercise.

Section Chiefs were evenly divided on the effective utilization of training time whether in garrison or in the field. Those who felt that training time was being used to good advantage pointed to the use of lag time as a training opportunity and considered the field exercise as a useful "full-bore" training activity. Those who disagreed felt that much time was being wasted with operational procedures such as maintenance and communications problems and that the training lacked variety being dominated by repetitious fire missions.

Training Strategies, Methods, and Techniques. DIVARTY is not an active player in the development of training strategies for this MLRS Battery and delegates the responsibility for training methods and techniques to the Battery First Sergeants. Pending the development of a Battery Training Plan and its identification with a written statement of mission objectives, training strategy lies with the conduct of the individual trainer at the Section level.

Training methodology encompasses platform instruction, sandbox scenarios, circuit training, equipment procedures demonstrations, hands-on tutorials, and OJT. Methodology is determined by the trainer and frequently is a matter of best fit with the conditions encountered during any given training period. Section Chiefs, interacting directly with their crew members, rely heavily on interviews and counseling to probe for weaknesses, ferret out personal insecurities with specific task requirements, and respond with appropriate methods to accomplish their training objectives.

The operational independence of an MLRS section in this Battery, resulting as much from the lack of a definitively structured training plan as the procedures which define the conduct of a fire mission, creates an opportunity for the innovative Section Chief to develop training techniques outside the dimensions of documented training procedures. Conversely, it allows the unmotivated trainer to waste available training time while waiting for directions which don't always arrive.

Effective use of lag time characterized those trainers who seized on the opportunity to polish skills, review Job Books, maintain equipment, and elevate morale. Recognizing their freedom to act as an independent HQ section, they create scenarios to challenge performance with continued improvement as the training standard. Less effective trainers identified themselves by a recitation of the obstacles overcome by their peers including, -- excessive lag time.

Training Events. The MLRS Battery has not participated in an NTC rotation for eighteen months and has never been sent to REFORGER. The Division has sent units to exercises in Egypt and Turkey but has not included the MLRS Battery in those deployments.

Maneuver elements maintain priority in the Red/Amber/Green cycle because of the very strong focus by the Division on NTC. DIVARTY has two rotations per year to NTC and during the pre-deployment train-up the Red/Amber/Green cycle tends to be disrupted. Training priorities do not extend to the MLRS Battery even if they should be in a Green cycle.

The DIVARTY goal is to give each of the separate Batteries an ARTEP each year. The last ARTEP for the MLRS Battery was February 1989. The next ARTEP was tentatively scheduled for June 1990 subject to the availability of an evaluation team.

Training Scheduling. Scheduling of training times, ranges, and resources for the MLRS Battery is done at a range resource conference managed quarterly by the Division. Each of the Battalions and separate Batteries are identified by degree of priority within the Red/Amber/Green cycle and, with the exception of the MLRS Battery, have first choice of the training areas and resources.

The most recent documentation of MLRS Battery training schedules available to this study covered the period 1 May 1989 to 17 November 1989 and was distributed in the following proportions:

.25 = Battery Collective Training
.40 = Platoon Collective Training
.05 = Section Collective Training/Sergeant's Time
.30 = Individual Training.

For the 1435 scheduled training hours covered by this distribution:

359 hrs = Battery time including Section certification
574 hrs = Platoon time including field exercises
72 hrs = Section time/Sergeant's Time for each of 12 sections
430 hrs = Individual time not including SQT, CTT, weapons, or recurrent training/testing.

Scheduling for train-ups on weak task performances is a function of weekly Section training meetings. Section Chiefs submit their requests to the First Sergeant who reserves approximately 50% of the training time for train-up activity. The remainder of the time is reserved for mandatory Battery training.

Personnel Involved in Training. The DIVARTY Commander, who acknowledges his lack of expertise in MLRS, places a correspondingly higher priority on the selection of the Commander for the MLRS Battery. Among his criteria for selection of the Battery CO are a previous successful command and personal knowledge of the candidate's character over an unstated period of time.

The Battery Commander and First Sergeant have the responsibility for training generally and look to the Platoon Leaders and Platoon Sergeants to coordinate training activity directly with the Section Chiefs.

Within this Battery, the Section Chief is the key figure in the real planning, coordination, and conduct of training activity.

Performance Evaluation Technique

Evaluation by DIVARTY of the MLRS Battery is based on a yearly ARTEP, the Command Inspection Program, and briefings provided by the Battery Commander. DIVARTY is not involved directly with a review of SQT or CTT scores although they are discussed during the quarterly training review.

Current evaluation within the Battery includes a detailed Section certification procedure clearly related to critical tasks and the METL. This evaluation procedure identifies specific tasks, the conditions of their performance, and the standards to be achieved. The certification is structured to include hands-on performance evaluations and a written test. Safety certification is also conducted by the Battery.

The Battery METL was developed using SATS and does, therefore, articulate with the DIVARTY METL. Lower echelon articulations extend through the Platoons and includes some Section tasks. A Battery TAC SOP has been written, but it is general in content and does not get down to the task level. After-Action Reports are held following a field training exercise.

Battery evaluation of the Platoons is based on personal observations by the Battery Commander and the Operations Officer supplemented by briefings from the Platoon Leaders. Within the Platoons the Platoon Leaders and Platoon Sergeants rely on their own observations, direct interaction with the Section Chiefs, and a review of SQT and CTT performance. Evaluations of Platoon performance in round-robins during attendance at Learning Center forums is a useful but irregular occurrence. Soldier's Job Books provide limited feedback on Platoon tasks but do not contribute to the evaluation of MLRS tasks collectively. There are no Job Books for MLRS peculiar tasks.

Evaluation of the Sections by Platoon Leaders and Platoon Sergeants follows a similar pattern of observation, SQT and CTT assessment, and briefings with Section Chiefs. Evaluation within the Sections by the Chiefs centers on his on-going review of hands-on performance by crew members and the quality of their performance relative to the standards of impending training events such as SQT, CTT, and the ARTEP. Performance records reside in the Job Books and test scores as they become available.

Site 5

Training Guidance

Annual and quarterly training guidance published by the Division is incorporated into DIVARTY training documents in accordance with its "Go to War" mission. MLRS-specifc content in DIVARTY guidance to the Battery is limited to a broad outline in which specific changes for MLRS training are highlighted. The DIVARTY Training Guidance reflects input from the Battery, which participates in setting its own training goals.

Training guidance from the Division and from DIVARTY bear directly on the 90-day schedules provided to the Platoon Leaders and the Platoon Sergeants by the Battery Commander. Key training goals are provided by the Battery at quarterly briefings and a range of training objectives are discussed during weekly meetings. The Battery mission is to help the Platoons conduct training. In support of this mission, the Battery publishes a training statement and prepares a METL. Inputs to the Battery from the Platoons is limited to the weekly meetings.

Training Resources - Availability and Adequacy

DIVARTY believes the limited availability of land and the restriction on overhead fire to be the biggest problem confronting MLRS training. Maintenance is acknowledged to be a major problem also, although DIVARTY is not aware of any parts limitation. DIVARTY's role at this site is to monitor and evaluate training management. They recognize that there are problems with calibration of the launchers but in terms of any relationship with resources they regard that as a problem to be resolved at Battery level. Their role in the provision of training resources is limited to "very general things like classrooms and projectors. The Battery handles the other things and we provide administrative support."

The Battery agrees that the limited land area is the primary resource constraint and that DIVARTY resources are difficult to get, but disagrees with DIVARTY's position that 108 rockets per year for the Battery is adequate for training. The Battery contends that the 108 rockets are not divided equally among the Platoons and Sections because of turbulence and that it is dangerous to fire two or three rockets at a time. They believe it is safer to fire an entire 6-pack.

Platoon Leaders and Platoon Sergeants felt that the unavailability of manuals was a deterrent to effective training. Specifically, they listed current edition CTT manuals as totally unavailable, equipment updates - particularly HEMAT - as impossible to obtain, problems with getting a revised TC 6-60, and pointed to a drop in SQT scores as the result of a shortage in SQT manuals and the reduction in study opportunities. Training aids were considered to be adequate. Development of a fire mission simulator with programmed faults was suggested as a cost-effective alternative to equipment breakage which occurs in training.

Section Chiefs expanded on the problems associated with land restrictions. Requirements must be submitted 4-6 months in advance to access training areas with severe restrictions on maneuvering. The problem has been intensified by the National Forest Service which has put several areas off limits. Entry to one of the few remaining firing points now requires special permission.

Terrain features in available areas are considered inadequate because there is a lack of streams to provide crossing practice and the gradients exceed the mobility of the larger wheeled vehicles.

The absence of emergency destruction kits, communications security gear, and the materials associated with S-8 maintenance requirements were identified as training resource problem areas. Training aids for preparation and response to a nuclear attack are unavailable within the unit.

Maintenance support from MOS 27Ms is regarded as a serious inadequacy because of its impact on the operational availability of launchers and the resultant loss of training time. Because MOS 27Ms are not assigned to the MLRS Battery there is no control over their time which causes administrative delays in obtaining their services. Section Chiefs were vociferous in their insistence that MOS 27Ms be slotted in the Battery where they are needed, – that having them there "... would make all the difference in the world." Training experiences in Germany were referenced where MOS 27Ms were assigned to the Platoon and stayed with it in the field and in the rear. Locally, the practice of MOS 27Ms refusing to touch anything but a super-clean vehicle has resulted in frequent and extensive downtime.

The allotment of 108 rockets per year for the Battery is considered inadequate by the Section Chiefs. They contend that firing three rockets at a time on one azimuth is not realistic and does not replicate a wartime situation. If the firing schedule should result in the firing of 12 rockets in the first six months, they argue that the next crew may wait 18 months to fire any at all. "Realism is in the form of a 12-pack."

The Battery Commander's quarterly training briefing for the third quarter of FY 90 shows that 54 rockets were expended in the first two quarters of FY 90 and that 36 rockets were planned for the third quarter. Live fires were planned for an FTX and an LFX.

Training Conduct

DIVARTY's frame of reference for MLRS training appears to be driven more by their familiarity with tube artillery than their awareness of MLRS requirements. The content and frequencies of training for the MLRS Battery are not driven by major external events. MLRS training requirements present a problem for DIVARTY in terms of ARTEP because there is a lack of expertise. MLRS training is tracked by an E-7 reporting to the DIVARTY S-3, but there is no train-up activity in-house to enhance DIVARTY understanding of MLRS operations and training.

Battery team training takes place on the last two days of a 3-day FTX (scheduled irregularly), and intermittently during the two-week FTX/LFX each quarter. Integration of Section, Platoon, and Battery training is folded into these exercises with emphasis on any identified weaknesses that have been observed during the intervening period or previous field exercises. Emplacement, Battery defense for a nuclear attack, Battery communications procedures, and leadership training characterize Battery training activities. Battery command maintenance is regularly scheduled on Tuesdays unless other events take precedence.

Training on tasks specific to the Platoon follow a pattern similar to Battery team training. Time is reserved during an FTX for training on Platoon tasks which might include NBC MOPP-4 rehearsals, ECCM field problems, and Platoon defense. Coordination with the Ammunition Platoon and the Ammunition Logistics/Operations Center (ALOC) is a Platoon training objective but vehicle

and driver shortages frequently force an adjustment to training for resupply. Cross-training among the Firing Platoons and the Ammunition Platoon occurs once every six months during team training on Thursday mornings. Convoy tasks are exclusive to the Platoon and are practiced whenever more than one SPLL are moved from the Motor Pool to a training area.

Section training for team and individual tasks occupies the greater part of available training time and does, in fact, merge with time provided to Platoon and Battery training. Because training for larger organizational units incorporates the task performance of lower echelons, the only real demarcation of training activity lies with tasks peculiar to the specific echelon. Mass fires, "time-on-target," and chemical support for hasty decontamination are generally regarded as Battery-specific tasks which cannot be effectively practiced within lower echelons. Receiving fire missions, communications, and convoying are seen as Platoon tasks beyond the normal operations within a Section. Otherwise, Section-level training dominates the time and resources devoted to the accomplishment of MLRS training objectives.

Section Chiefs do not consider MLRS tasks difficult to perform and did not agree on which tasks are the hardest to train. MOPP gear exchange was referenced less for its degree of difficulty than for the time required to accomplish it. The limp home procedure was regarded as dangerous if not performed properly but it was not considered to be a difficult training task. The majority opinion among Section level personnel was that MLRS tasks "...are really pretty easy."

Cross-training within the Sections is an on-going activity. Everyone in the Section is given an opportunity to work at everyone else's job including the Chief's. Cross-training with ammunition personnel takes place during team training on Thursday morning. Firing crews work through the resupply points but rarely reload directly from the trucks or trailers. The cross-training activity is coordinated through the ammunition holding area (AHA) and is limited more by the availability of ammunition personnel than any collection of other delimiting factors.

Training newly assigned soldiers right out of school was not viewed as an interruption of the training required to meet other training objectives. Instead, it was considered a useful training refresher which tended to keep Section Chiefs sharp. Launcher maintenance training and in-depth familiarity with the equipment were considered to be primary training objectives. Section Chiefs supervise the training which starts at skill level 10, includes a walk-through of the Preventive Maintenance Checks and Services (PMCS), and moves to skill level 20 tasks according to the new soldier's demonstrated competence. Most of the training is hands-on in the belief that it's easier to physically run through the tasks than to read about them.

Training efficiency, reflected in the comments of Section level personnel, indicates that full advantage is not being taken of the scheduled time for Section, Platoon, or Battery training. With few exceptions, field exercises were described as mostly waiting for fire missions to come down from the Battery FCC, moving to and from the training area with the Platoon, or frequent snack bar runs during garrison training. Estimates of training efficiency ranged from 8-12% for training in the field and around 40% for garrison training. Maintenance, communications, and calibration problems were mentioned as training detractors.

Training Strategies, Methods, and Techniques. DIVARTY would definitely support a personnel trade with another unit as a good training exercise to introduce MLRS people to new conditions and new terrain. Recognizing the dollar shortage which prevents participation of an MLRS Platoon with each NTC rotation, DIVARTY would welcome an opportunity to send the entire MLRS

Battery, if possible, to another training site by an interchange of personnel to avoid the cost of transporting heavy equipment and support material.

Training strategy for the Battery centers on the development and implementation of the training schedule to incorporate DIVARTY guidance, Battery objectives, and inputs from the Platoons and the Sections. The Battery believes there is a motivation problem to be solved and relates that to the frequent taskings which interrupt the training schedule.

Platoon planning focuses on those training problems which confront Platoon training objectives. Communications generally, and ECCM and equipment maintenance specifically, Communications security, require the frequent attention of Platoon Sergeants who resort to lecture/labs, demonstrations, and hands-on training to maintain an operational status. The planning and coordination of Platoon defense is hampered by the spread of SPLLs, the resultant uncontrolled perimeter, and the availability of MOS 13Ps, whose responsibilities include perimeter defense. The HQ section is conceded to be a "sitting duck."

Training methodology and the techniques employed by trainers resides predominantly within the Sections. Training schedules, outlines, and manuals are the guides to be followed, but Section Chiefs have the freedom to train on their own selected tasks according to their assessment of the most critical needs. Determination of those needs, and the identification of task performance weaknesses is based on the individual ability of the Section Chief as a trainer to compare his observations with a thorough understanding of performance standards and to use appropriate training techniques to eliminate the manifest differences.

Much of the training provided by the Section Chiefs is on a crawl-walk-run continuum in which the soldier is methodically taken through the sequence of steps in the performance of a given task. Closely supervised hands-on instruction, repetitive drills, testing against established standards - frequently by timed practice sessions - and problem scenarios within the context of OJT typify trainer activity.

Cross-training within the Section places an emphasis on the Driver of the SPLL to know the Gunner's job as well as his own. If the launcher must be operated by a 2-man crew, mobility is maintained by the coordinated efforts of the Chief and the Driver. Once the launcher is in position to fire, the Driver is free to take over the Gunner's responsibilities. Most of the cross-training takes place in the Motor Pool or in local training areas. Field exercises are restrictive on cross-training to the extent that crews waiting for a fire mission to come down do not have the freedom to leave their primary duty positions.

Training Events. Removal of MLRS from the troop list for recent NTC rotations makes the planned yearly ARTEP the principal training event. Approval for the ARTEP is a DIVARTY function but the Battery handles the preparations through their training schedule. Training intensifies before the ARTEP and MLRS diagnostics scheduled for September 1990. Live fires become significant training events to the extent that relevant task performances must be rated a "GO" before a live fire is scheduled. DIVARTY policy on MLRS live fire is developed by the DIVARTY Commander supported by the MLRS Battery Commander.

Performance Evaluation Techniques

DIVARTY considers themselves to be at a 70% level in their understanding of how MLRS operates. Outside evaluators provide an objective assessment of how well the Battery performs during an ARTEP but the DIVARTY S-3 drives the scenarios for the evaluative process. Quarterly inspections of the MLRS Battery are conducted the DIVARTY Commander, his Executive Officer, and the DIVARTY S-3. The Command Sergeant Major and the E-7 assigned to the DIVARTY S-3 track individual training and monitor the Battery SQT scores.

The Battery monitors team training during the last two days of an FTX, keeps records of the standard PT scores and weapons firing scores, and uses the ARTEP Evaluation Packet along with the TC 6-60 as a guide for evaluation. The Battery Training NCO is responsible for maintaining the files on performance evaluation.

Platoon Leaders and Platoon Sergeants tend to rely on SQT and CTT scores, a review of Job Books, and their own observations during live fires to determine how well their Platoons can perform their tasks. Firing Platoon Sergeants maintain the Field Expediency Book which is a larger version of the job book kept by the Section Chiefs, and may keep their own record card on the individual soldier's job proficiency. The Ammunition Platoon Sergeant monitors the Section Chief's Job Books but relies primarily on his own observations to know how well his people are performing.

Daily contact by the Section Chiefs with their crews provides constant feedback on task performance by direct observation. Job Books are kept by most Section Chiefs and all scores from SQT, CTT, Section certification, weapons firing, and PT are reviewed as they become available. Section Chiefs consider counseling to be a primary valuative tool and use it as a starting point in their analysis of the job performance of newly assigned soldiers.

The following Corps Artillery Evaluation Guides are to be adapted for use by this MLRS Battery:

- MLRS Firing Section
- FDC Section
- Ammunition Section
- Communications Section
- Maintenance Section
- Survey Section

These guides contain both written exams and hands-on evaluation procedures. Detailed scoring guides and answer sheets are also included. A Letter of Promulgation (9/86) indicates these are an interim expedient while awaiting publication of the ARTEP MTP.

The Battery has prepared a draft TAC SOP (11/89) that contains procedures and criteria for tactical operations. Review of the document shows a well established relation to TC 6-60.