



MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

AD A116231

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A116231	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) An Analysis of the Army Conventional Ammunition Rate Studies	5. TYPE OF REPORT & PERIOD COVERED Student Essay	
	6. PERFORMING ORG. REPORT NUMBER	
7. AUTHOR(s) LTC Benson F. Landrum	8. CONTRACT OR GRANT NUMBER(s)	
9. PERFORMING ORGANIZATION NAME AND ADDRESS US Army War College Carlisle Barracks, PA 17013	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS	
11. CONTROLLING OFFICE NAME AND ADDRESS Same	12. REPORT DATE 19 April 1982	
	13. NUMBER OF PAGES 26	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	15. SECURITY CLASS. (of this report) Unclassified	
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Paper outlines how and why a conventional ammunition rate study is conducted by ODCSOPS and the Field Artillery School, outlines the various input data that supports these study efforts and how the study results are utilized by the Army staff and field organizations. The problem of the various conventional ammunition rate studies being conducted not using common input data is addressed. The paper concludes with a recommendation that ODCSOPS be designated as the proponent agency for all Army conventional ammunition rate studies.		

US ARMY WAR COLLEGE
INDIVIDUAL RESEARCH BASED ESSAY

The views expressed in this paper are those of the author and do not necessarily reflect the views of the Department of Defense or any of its agencies. This document may not be released for open publication until it has been cleared by the appropriate military service or government agency.

AN ANALYSIS OF THE ARMY
CONVENTIONAL AMMUNITION RATE STUDIES

BY

LIEUTENANT COLONEL BENSON F. LANDRUM

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A	



19 APRIL 1982

Approved for public release
distribution unlimited.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
Statement of the Problem	3
Investigative Procedures	5
II. THE ODCSOPS AMMUNITION RATE STUDY	7
Types of Rate Studies	7
Purpose of Ammunition Studies	9
ODCSOPS Ammunition Study Input Data	13
III. THE FIELD ARTILLERY SCHOOL AMMUNITION RATE STUDY	16
Types of Rate Studies	16
Scenario Data	17
IV. VARIABLES IN COMPUTER STUDY INPUT DATA	19
Threat Data	19
US Doctrine Data	20
TPFDL Data	21
Navy/Air Force Data	21
V. CONCLUSIONS AND RECOMMENDATIONS	23
Problem	23
Paper Organization	23
Conclusions	24
Recommendations	24
Summary	26

CHAPTER I

INTRODUCTION

An Army conventional ammunition rate study is based on a computer war game that has been developed for a specific area of the world. The computer major war game input data consists of such items as blue forces available (to include those units that are deployed to the area before and during the simulated war game), threat data, blue/red tactics (approved and/or known doctrine) and types of blue/red weapon systems with associated ammunition available to the field commanders. The computer war game would then be "played" to determine how much blue conventional ammunition is expended for each type of weapon system during a specified period of time. For example, let's assume the computer determined that 10,000 high-explosive (HE) rounds of 81mm mortar ammunition was expended by the deployed blue forces in the European Theater during the first three days of a simulated war. The number of 81mm mortars (data extracted from modified tables of organization and equipment — MTO&Es) with the deployed blue forces was determined to be 5,000. Therefore, the daily HE mortar ammunition rate for the first three days of the European War would be 2,000 rounds per-tube per-day (10,000 rounds divided by 5,000 mortars equals 2,000 rounds). An ammunition rate study will predict the rate of fire for all types of ammunition, fuzes, and propellant combinations for each type of weapon

system available to the blue force for a specified period of time (3 days, 15 days, 30 days, 60 days, etc.) that has been selected by the study proponent. The Air Force and Navy determine their ammunition rates and requirements in basically the same manner as the Army, by using a computer war game.

There are some key blue and red force assumptions that are made in any ammunition rate study. Examples are as follows:

- Howitzer, tank, and mortar tubes do not become condemned due to the number of projectiles fired (spare tubes are available on the battlefield).
- Sufficient ammunition stocks, transportation assets, and personnel are available for resupply actions (a weapon system has ample quantities of all types of ammunition to fire any mission).
- The weapon systems and units are not degraded for lack of trained personnel.
- Munitions lost by saboteur actions are accounted for by including a predetermined amount of projectiles in the computed ammunition rates (blue forces only).
- Target acquisition assets are not degraded due to enemy action, weather, and/or crew training.

These major assumptions are made because the purpose of the study is to determine a blue force ammunition rate and not to evaluate the blue or red ammunition resupply system, personnel replacement system, etc.

Currently, conventional ammunition rate studies are being conducted by the Office of the Deputy Chief of Staff for Operations (ODCSOPS) and various Army service schools. The frequency that these rate studies are

conducted is not on a set schedule — they could be annually, every two years, or when a specific requirement such as determining lethal effectiveness of one projectile versus another projectile, has been validated to warrant such a study. As a general rule, ODCSOPS conducts a United States Army, Europe (USAREUR) and an Eighth Army (Korea) ammunition rate study every two years with the various service schools completing a study when the situation presents itself. For example, a service school could conduct a study on a new projectile that has been proposed and/or developed, or to justify an ammunition vehicle change to a given MTO&E, or to support recommended changes to the Division 86 Study initiatives.

Statement of the Problem

The fact that ammunition rate studies are being conducted by different agencies is not well known by the major Army staff organizations in general and in particular, the field units who design and implement ammunition related contingency plans. The purpose of the various studies is not normally understood by the majority of Army personnel as to the impact the rate data will have on contingency plans, logistical systems, and in determining combat readiness. If data extracted from a given rate study and applied to a problem area other than what the rate data was developed for (ammunition storage requirements, basic load configuration, etc.), it could obviously lead to catastrophic results.

To illustrate the misunderstanding that often arises when an organization extracts ammunition rate data from a published study report and applies that information to a real world problem, one has only to review how a given divisional field artillery battalion in Korea determines what combination of projectiles, fuzes, and propellants should

comprise the unit's combat basic load of ammunition. This basic load configuration could be based on:

- The field artillery commander's past experience in conjunction with assigned contingency missions.
- The appropriate Field Manual (FM) that recommends a basic load percentage configuration. These FMs are published by the Field Artillery School and contain recommended basic load percentages based on "their" rate studies. These FMs are readily available as they are normally distributed down to battery level.
- Supply Bulletin (SB) 38-26 which recommends a basic load configuration. The SB is published by HQDA and is based on the rate studies conducted by ODCSOPS. The distribution of this document is not normally below division level.

Needless to say, all three of the above options will result in a different basic load configuration — in particular, the FM and SB provide different rate data for the same theater of operations. In this example, the ODCSOPS rates contained in the SB are utilized to determine the 2nd Infantry Division field artillery units theater war-reserve ammunition stockage requirements; therefore, that level of in-country stockage will be available for resupply actions. If the units basic load configuration was based on the field artillery FM rate data, then the replenishment of that basic load will not "synch" with the ODCSOPS ammunition war-reserve assets that have been stocked. In short, these two publications (FM and SB) are providing different rate data that may be available to a field commander. Not knowing and understanding what the various rate data is to be used for could lead to major disconnects

in executing a contingency plan. The same type of problem exists for field artillery units in USAREUR and CONUS as well as for other branches of the service.

Investigative Procedures

This author was assigned to ODCSOPS, during the period 1976-1979, with the primary job of conducting USAREUR and Eighth Army conventional ammunition rate studies and therefore, understands the ammunition requirement development process. It was during the last 12 months of this assignment that it became known that "other" rate studies (other than HQDA) were being conducted with results being published and distributed in various Army publications. An attempt was made to coordinate the Army rate study effort, but it was unsuccessful primarily because of the lack of understanding by the various organizations operating outside of the Pentagon, as to why ODCSOPS was in this field of study.

After the ODCSOPS assignment, the author was assigned to Korea (2nd Infantry Division) as a field artillery battalion commander for 12 months. The basic load configuration that was accepted in Korea was primarily based on a "best guess" — no one in the division was aware of SB 38-26, and in asking for assistance from Eighth Army, the same negative response was received. This experience just reinforced my position that the majority of the field units and staffs are neither aware of the ammunition rate studies and their associated publications or how in-country war-reserves are determined and the relationship of war-reserve ammunition with the basic load configuration.

In writing this paper, the author used as a starting point the knowledge and experience obtained in the ODCSOPS and field artillery unit assignments. Numerous telephone conversations were held with the

primary objective being to update the ammunition rate study process.

The agencies contacted were as follows:

- ODCSOPS, Requirements Directorate
- Office of the Deputy Chief of Staff for Research, Development and Acquisition (ODCSRDA)
- Office of the Deputy Chief of Staff for Logistics (ODCSLOG)
- Program, Analysis and Evaluation Directorate (PA&E)
- Concepts Analysis Agency (CAA)
- Field Artillery School

The remarks, opinions, and comments collected from the various agencies was under a non-attribution policy.

It is the author's opinion that more detailed information could have been obtained by personal visits but this was not undertaken because of prior commitments during the academic year.

The investigation has been concentrated in the following areas:

- Can the Army's ammunition rate study process be streamlined and made more effective?
- Is there a duplication of work in ammunition rate studies?
- Utilization of ammunition rate study data by field agencies and units.

CHAPTER II

THE ODCSOPS AMMUNITION RATE STUDY

This chapter will briefly outline the ODCSOPS ammunition rate study development process. The reader of this paper should have an understanding of the study basics, to include the involvement of other Army and service agencies, in order to properly evaluate the author's conclusions and recommendations that have been proposed in Chapter V. Chapter III will outline the Field Artillery School ammunition rate study process, with Chapter IV addressing the critical factor of computer war game input data and the impact it has on a rate study.

Types of Rate Studies

The ODCSOPS conducts two types of ammunition rate studies: a programming study, referred to as a "P" study; and a distribution study, referred to as a "D" study.

The "P" study is normally conducted every two years based on the projected Army posture and organization in the last (fifth) year of the upcoming Program Objective Memorandum (POM). For example, the "P" study conducted in FY 82 would be based on a FY 87 scenario with the results listing the ammunition requirements (objectives) that will be required by the Army for FY 87. The POM FY 83-87 would include procurement programs throughout the five year period to reach the stated requirements (objectives) assuming that ammunition programs were allocated

monetary assets by the Army's leadership.

The FY 87 scenario would include such items and considerations as:

- The FY 87 projected threat.
- Those blue units that will have been reorganized based on the Division 86 Study.
- Those blue units that will have been issued modernized equipment such as the M1 Tank with a 120mm cannon, Bradley Fighting Vehicle, M198 Howitzer, Advanced Attack Helicopter, etc.
- The projected on-hand equipment status of selected blue Reserve and National Guard units; a given number of these units may have been issued the M60 series tank as a result of the M1 tank being produced and fielded.
- The number of Copperhead projectiles that will be produced and fielded to blue artillery units.

The above entries are only a selected few of the numerous types of force status considerations that have to be reviewed in order to project an accurate FY 87 blue force. It is rather obvious that the validity of any "P" study will depend on how accurate these forecasts are in projecting out five plus years.

As with any study that is based on projected data, there will be changes sooner or later; it is just a matter of when the changes will occur. The most frequent changes of input data to an ammunition rate study occur in the area of equipment status. If a rate study was based on "X" number of battalions having the 120mm tank in FY 87 and then Congress decides in FY 83 to reduce the 120mm tank buy by 50 percent, this could invalidate the study rate results for all M60 tank, attack

helicopter, anti-tank, and field artillery munitions, as these rates would be understated; the assumption being that a 120mm tank is a more efficient weapon system against red tanks than the attack helicopter, anti-tank, and field artillery munitions. This type of situation, where a critical part of the war game input data is changed, is not viewed as unusual in the rate study process. Therefore, the requirement exists that the "P" study be conducted at a minimum of every two years as the POM years are very fluid from one year to the next in regards to unit organizations, type weapon systems available, number of modernized projectiles that have been produced, etc.

The "D" study is not normally conducted every two years because it does not rely on five year plus force projections. This study is primarily concerned with the "real-world" of ammunition requirements. If a "D" study was conducted in FY 82, it would normally be based on the Army's projected posture and perceived threat for FY 84. This FY 84 scenario would include the same items and considerations that were outlined above for the "P" study. As an example, if the Copperhead projectile was not scheduled to be fielded until FY 85, then it would not be played in the FY 84 "D" study war game but would be considered in the FY 87 "P" study war game. Because this projectile was not considered in the "D" study, then the requirement for the fielded tank defeating rounds would be much higher than if the Copperhead projectile had been played in the simulation.

Purpose of Ammunition Studies

The primary purpose of the "P" study is to determine what the total Army conventional ammunition requirements are to fight a war in either Europe or Korea, based on a predetermined war duration time (30 days, 60

days, 90 days, etc.). These study ammunition requirements are staffed with the approved rates and acquisition monies folded into the various programs of the five year POM. For example, the FY 82 "P" study was conducted to state the ammunition requirements for POM FY 83-87. This study may state that 50,000 155mm howitzer dual-purpose improved conventional munitions (DPICM) rounds are required to fight the first 30 days in a NATO conflict. In addition, let's assume that the Defense Guidance (DG) for POM FY 83-87 states that the Army will develop (as a minimum) a POM ammunition procurement program that will sustain the US Army for 30 days in a NATO conflict. Simply stated, the Army has to budget monies to acquire 50,000 DPICM rounds by the end of FY 87 (last year of the POM). The first step in accomplishing this DG directive will require the ODCSOPS (responsible agency for the ammunition study) to pass the 50,000 DPICM round requirement on to ODCSRDA so that necessary plans can be developed to produce and acquire the projectile. Obviously, ODCSRDA would first determine what assets (if any) were on-hand and then work with this balance of projectiles. The ODCSRDA staffing could result in additional budget implications (other than acquisition costs) if there is no production facility available to produce the DPICM projectile; therefore, monies would have to be budgeted for a production facility if none exists. Once ODCSRDA has made the decision that the 50,000 rounds can be acquired during the POM years, ODCSLOG would be informed so that the cost of storage and shipment can be budgeted. The Office of Engineers and USAREUR would be kept abreast of this overall action so that these organizations could plan for in-country war reserve storage facilities which will have an impact on the budget. This same process would be conducted for each ammunition, fuze, and propellant line item so that a coherent plan can be developed to insure that a USAREUR 30 day

war reserve package can be achieved by the end of FY 87, as directed by the DG. Again, any slippage or acceleration in the procurement and/or distribution of a weapon system will have an impact on the ammunition plan. In summary, the "P" study states the conventional ammunition requirements for the POM years that is required to support US Forces in a Korean or European conflict.

The primary purpose of the "D" study is to assist the DA Staff and the effected MACOMs (Europe and Korea) in evaluating the ammunition combat readiness of a given theater and to establish priorities in the near-term shipment/distribution of available munitions. The 50,000 DPICM round example, outlined in the explanation of the "P" study above, will also be used in this discussion. Assume that a "D" study for Europe was conducted in FY 82 for the FY 84 time period. The current DPICM acquisition plans (the projected ODCSRDA input data for POM FY 83-87) states that 25,000 rounds will have been produced by the end of FY 84. In the computer war game, the DPICM round is a much more effective munition against certain targets than is the current HE projectile; therefore, when a target is engaged in the computer it would select the DPICM round for firing as opposed to the HE projectile. Since sufficient DPICM rounds will not be available in FY 84 to support the first 30 days of the conflict, the HE round will have to be substituted. An example of the first 30 day HE and DPICM requirements from the FY 84 "D" study compared to the FY 87 "P" study could be as follows:

FY 84 "D"*

155mm Howitzer	HE	<u>1-30 Day Reg</u> 50,000
	DPICM	<u>25,000</u>
	Total Reg	75,000 rounds

FY 87 "P"*

155mm Howitzer	HE	<u>1-30 Day Reg</u> 10,000
	DPICM	<u>50,000</u>
	Total Reg	60,000 rounds

* Note: The above numbers for projectile requirements are examples — actual numbers are classified.

The USAREUR planners should refer to the FY 84 "D" study results in developing ammunition resupply requirements and notifying the in-country units of the on-hand war reserve assets. It can readily be seen that a storage and movement requirement would exist during a conflict in FY 84 for 75,000 rounds as compared to 60,000 rounds in FY 87. This type of information is of significant value in developing contingency plans and also in determining basic load configurations. ODCSOPS and USAREUR planners can also see that an excess of 40,000 HE rounds will be available at the end of FY 87 (assuming that the DPICM procurement program remains on schedule). It could be that Eighth Army would have a valid FY 87 HE requirement that could be filled if the decision was made to transfer the excess USAREUR ammunition. If no requirement exists in Korea, then the HE rounds may be made available to the Foreign Military Sales program, or the Army's 155mm howitzer HE training allocations may be increased. There are many viable options for the disposition of the excess HE projectiles. If the DPICM acquisition program is delayed for

any number of reasons (budget cuts, improved projectile has been introduced to replace the DPICM round and monies are transferred to this program from the DPICM account, etc.) then adjustments could be made to the USAREUR artillery HE redistribution program. In summary, the "D" study is primarily used for the near-term planning and establishing available ammunition distribution priorities. This type of study has minimal impact on the POM in the area of ammunition acquisitions, but rather is meant to assist the field commanders in developing an in-country ammunition program to include basic load configurations.

ODCSOPS Ammunition Study Input Data

The ODCSOPS study process ("P" and "D" studies) is controlled and directed by a Study Advisory Group (SAG). The major representatives that comprise the SAG are as follows:

- ODCSOPS
- ODCSLOG
- ODCSRDA
- ASCI (Intelligence)
- PA&E
- Air Force
- Navy
- TRADOC
- CAA
- Theater (Europe or Korea)

The ASCI representative provides the projected study threat data that would be confronted in the theater for a given FY. The threat would include the available units and the enemy's tactical doctrine.

The Air Force and Navy representatives provide both projected

assets and their scheme of engagement that would be employed in the theater. It should be noted that these two services request the same type of data from the Army when developing their input data for determining ammunition requirements. The primary reason for this exchange of data is to give the other services credit for their contributions to the simulated battle. If the services computed ammunition rates/requirements independently, more targets (tanks, command posts, etc) would be engaged than the enemy has in their inventory. When the studies are reviewed by the Office of the Secretary of Defense (OSD) and the Office of Management and Budget (OMB), they insure that all services have participated so that "double kills" are not counted in the ammunition rates/requirements. If OSD and OMB were not acting as the honest brokers on service participation in the computer studies, all services could have inflated ammunition requirements.

The CAA is the ODCSOPS field operating agency that actually performs the computer war game simulation. This agency also conducts other Army studies that includes ammunition rate data. This point will be developed further in Chapter IV.

The TRADOC representative provides the latest information regarding US Army tactical doctrine. As an example, for the FY 82 study they would have been the expert on how the Airland Battle concept is to be employed on the battlefield.

The ODCSRDA representative would provide data concerning the number and type of the various weapon systems and munitions that would be available in a given FY.

The ODCSLOG representative will monitor the developing "P" study requirements and insure that the "D" study results are published in SB 38-26.

The theater representative will also monitor the developing requirements and provide expertise on appropriate contingency plans that are to be executed.

The ODCSOPS representative provides the Time Phased Force Deployment List (TPFDL) for the appropriate study FY. The ODCSOPS and ODCSLOG representatives will cross-check to insure that when a given unit has received modernized equipment, the study input data reflects this action. When a given organization has been "modernized", this could result in a TPFDL change -- the same situation exists for units that are reorganizing under the Division 86 Study.

This has been a short summary of the SAG's representatives major responsibilities. Their input and staff coordination is vital if a given rate study is to produce a solid product in support of the POM or to assist in determining ammunition combat readiness.

One additional responsibility of the SAG membership is to recommend what ammunition rates should be adjusted based on input from CAA. For instance, the CAA representative might inform the SAG membership that they have little confidence in the Vulcan (Air Defense) ammunition rate based on their inability to accurately portray the weapon system in the computer war game. The SAG membership would then have to "adjust" the rate based on input from the various representatives. The rates "adjusted" by the SAG would be highlighted when briefed to the HQDA leadership.

CHAPTER III

THE FIELD ARTILLERY SCHOOL AMMUNITION RATE STUDY

This chapter will outline the Field Artillery (FA) School ammunition rate study development process. It should be noted that there are probably additional ammunition rate studies being conducted by other service schools but the author has a partial understanding of this particular agency's (FA School) operation from previous assignments. This chapter will focus on the FA School's computer study input data as this is the common subject area and link with ODCSOPS ammunition rate studies.

Types of Rate Studies

The FA School has the capability to conduct an ammunition rate study for any given time period. The purpose of their study will dictate the FY that the effort will be based on. For example, if the effectiveness of a proposed ammunition item is the question by the field artillery community, then a FY scenario would be selected that would enable that particular item to be in the field. If an ammunition basic load configuration based on available munitions is the question, then a near-term FY scenario would be utilized. In either of these two examples, ammunition rate data would be developed in order to analyze the subject matter. As the reader can readily see, the purpose of the FA School studies differ significantly from the purpose of the ODCSOPS studies.

Scenario Data

The FA School receives the majority of their computer study input data from Fort Leavenworth as they are the depository for such information. The FA School does not have the personnel or equipment to maintain an updated TPFDL, schedules of non-field artillery modernization items being fielded, production of ammunition to support the new weapon systems, and theater contingency plans for all services. Even if the service schools, to include Fort Leavenworth, had the capability to maintain updated information in these areas, it would be a monumental and almost impossible task in that the data changes on a daily/weekly basis.

All the FA School studies are based on an European scenario — no studies are conducted for Korea. Based on the primary purpose of the FA School rate studies, this fact is no surprise considering their restraints on personnel, money, and computer equipment.

The FA School studies have no direct impact on the Army's POM. These studies are conducted to support the justification for a new weapon system or ammunition item. Their ammunition rate data is briefed during the procurement decision-making process that culminates at HQDA. If the decision is made by HQDA to procure a particular item, then ODCSOPS will include that new item in their next ammunition rate study (the FA School rate data is not taken).

The FA School has also conducted rate studies for the purpose of providing guidance to field units in developing basic load configurations. This information is published in FMs as well as officer basic and advance course student reference material. No mention is made that the basic load data is based on a European scenario. For those officers

whose next assignment is Korea and during their tour they attempt to apply this basic load information, they will not be utilizing the "best" data for their area.

Currently, there is no formal coordination between the FA School and ODCSOPS on the conduct of conventional ammunition rate studies.

CHAPTER IV

VARIABLES IN COMPUTER STUDY INPUT DATA

The author has already alluded to the variables that are readily apparent between the ODCSOPS and the FA School conventional ammunition rate studies. To further explain this statement, a more detailed explanation of the four major study input areas is required.

Threat Data

As stated earlier in this paper, the ODCSOPS study threat data is provided by the ACSI representative on the SAG. This data package is based on numerous inputs from the various intelligence agencies in the Washington D.C. area. Before a threat data package can be released by ACSI to an Army study agency, it has to be staffed through an elaborate time consuming approval process within the intelligence community. It should be noted that there have been ODCSOPS ammunition studies initiated before an approved threat package was available from ACSI — this situation will arise when the Army is constrained on time because data "submission windows" for the budget and/or FOM will not permit a further delay in the overall study effort. Once the approved threat package is received by the SAG, then changes (usually minor in nature) are made to the computer threat data in the simulated war game with a new set of ammunition rates being produced. This is an accepted procedure so sufficient time is allocated for this intelligence update in the

study plan. Bottom line, ODCSOPS rate studies are based on the latest approved threat data. This threat package is not normally passed to Fort Leavenworth until requested. Depending on when the packet is requested, the data could and most probably will change just by the mere fact that "time" has elapsed. Another time delay would occur from the date it arrived at Fort Leavenworth until a service school has received the packet. The value of a packet at this point could be questionable.

ACSI representatives are available to the CAA war game personnel to assist in answering questions and insuring that the threat data was depicted correctly in the computer. No ODCSOPS rate study was ever conducted in this author's three year tour that did not entail CAA person-to-person assistance from the ACSI representative. Obviously, this type of assistance is not readily available to outside agencies (Fort Leavenworth and Fort Sill) and even if clarification was requested by these organizations, it would be most difficult to resolve, even by secure communications (teletype, telephone, etc.). In this author's opinion, the ODCSOPS and FA School ammunition rate studies for Europe are not based on a like threat data package.

US Doctrine Data

The same problem exists for US doctrine computer war game input data as explained for the threat package. The doctrine has to be interpreted by a given individual(s) in that a person follows his/her understanding of the doctrine in "fighting" the computer war game. Again, the TRADOC representative on the SAG is available to assist CAA in this effort. The service schools have the same procedure for inputting the doctrinal data, but obviously different personnel are completing this action. No two persons will exactly interpret the doctrine the same

during a 30, 60, 90 day computer war game. The two studies for all practical purposes have two different scenarios in regards to the employment of US doctrine on the battlefield.

TPFDL Data

The ODCSOPS representative on the SAG is responsible for maintaining the Army's TPFDL. This individual is available to assist CAA if the situation warrants. This author would contend that TPFDL data is the most fluid of all study input documents. Between the modernization schedule, personnel changes, unit changes, and status of units (Active, Reserve, and National Guard), there is a constant effort in ODCSOPS to maintain an accurate data base in this most vital area. If a major change is made to the TPFDL during a study, this fact will be incorporated into the ODCSOPS study within a matter of days. This procedure can not be accomplished in a timely manner for other agencies conducting ammunition rate studies.

Navy/Air Force Data

There has to be open communications between the three major services (Army, Navy, and Air Force) in determining ammunition requirements. As outlined in Chapter I, "double kills" on the battlefield will not be accepted. This fact alone requires that the services have a coordinated effort in determining ammunition requirements. The type of information required by the Army to conduct rate studies that preclude "double kills" is not available to the service representatives at Army service schools. If there are changes to the Navy/Air Force budgets and/or POMS on ammunition related matters, the Army's rate study has to reflect these actions.

Based on the above statements regarding the four major study input areas, this author suggests that conventional ammunition rate studies are being conducted utilizing different computer input data. Therefore, the question becomes one of how to correct this situation or if this course of action is not feasible, which study is more valid for the Army and its field organizations?

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

This chapter will summarize the paper and outline the conclusions and recommendations.

Problem

The problem is that there are various conventional ammunition rate studies being conducted by Army agencies that are not based on common input data. Currently there is no attempt by the Army to coordinate the rate study efforts within the community. Obviously, this results in different rate study data being developed and distributed to Army field organizations where often times the information is not utilized properly in relation to the overall ammunition program.

Paper Organization

This paper has been organized by first outlining how and why a conventional ammunition rate study is conducted by ODCSOPS and the Field Artillery School, outlining the various input data that supports these study efforts, and how the study results are utilized by the Army staff and field organizations. This author contends that the solution to the problem of developing/distributing conflicting rate data is a managerial challenge and can be corrected by using resources that are currently available within the Army.

Conclusions

The results of a conventional ammunition rate study are required by the Army staff agencies as well as field organizations. These rate studies are definitely the "back-bone" of a viable ammunition program which is currently in existence today. The most significant fault in the program is that there is vast duplication of effort, the various studies are not completely understood by the Army field organizations, and that a better product could be produced if the computer equipment and personnel were coordinated into a single effort. These faults can be corrected with ODCSOPS taking the lead in formulating a program that is supported and understood by the entire Army community. This is particularly important today when limited money, equipment, and personnel assets must be managed in such a way so as to enable them to realize their full potential.

Recommendations

It is recommended that:

1. The ODCSOPS be designated as the proponent agency for all Army conventional ammunition rate studies. In this capacity, one important facet would be to determine which TRADOC organizations (service schools, etc.) have ammunition study programs and for what purposes.
2. The ODCSOPS develop a computer war game program for each required theater (Europe, Korea, and with Southwest Asia, Panama, and Alaska being other possibilities). These programs should be developed for each FY with the input data published in a written text form. These various programs could be assembled and approved under the current management system presently established — the Study Advisory Group (SAG). One important factor that must be met is that these programs

would have to be available prior to a given FY in sufficient time so that budget and POM requirements could be addressed by the field organizations. This procedure would erase the major error of rate studies being based on differing input data and also eliminate the input data work by those organizations outside of HQDA. If a significant change occurred with the input data during the FY, ODCSOPS would be in the best position of being made aware of such information and could easily publish a change to the appropriate theater data package.

3. TRADOC be tasked by ODCSOPS to establish the needs and requirements of their organizations in regards to ammunition rate studies. This effort could result in the SAG membership being expanded to include the various service schools — a better system has to be established for the passing of study information and/or data.

4. TRADOC be tasked by ODCSOPS to perform special ammunition analysis. The one area that has not been fully exploited in determining ammunition requirements is the lethal and cost effects of one type of ammunition versus another. For example, a question has been raised as to whether or not the Copperhead projectile is cost effective in a European scenario for FY 83. The FA School could then be tasked (recalling that their European computer war game is based on input data provided by ODCSOPS — recommendation number 2) to analyze this problem by examining cost, lethality, weapon system/crew capability, and resupply system; then recommending a given action to the SAG or to TRADOC who would then present the findings to the SAG. If time would not permit the task to be performed in the TRADOC community, ODCSOPS could then task TRADOC to provide the appropriate personnel to CAA where the study would be performed. This cost effectiveness type analysis

could result in significant monetary savings as well as providing better ammunition requirements to field organizations.

5. That all HQDA studies be required to utilize the ODCSOPS theater computer war game packages. For example, the ODCSLOG conducts an Army Logistic Analysis Study which is based on a European scenario. This study should be based on the same FY computer input data (threat, TPFDL, US doctrine, etc.) as the ammunition rate study for that FY. This is particularly important as the ODCSLOG study utilizes the ODCSOPS ammunition rates in determining the overall logistical requirements (ammunition movement and storage requirements). If the ODCSLOG study was based on different war game input data than what the ammunition rates were based on, then an obvious disconnect is apparent before the study is even undertaken. Again, a coordinated effort on input data must exist. A secondary result of this action would be the time saved by the various staff agencies in assembling another study input data package.

Summary

The Army's conventional ammunition rate study program is already in place and is developing useful and required data. An effort has to be undertaken by ODCSOPS to bring the parties into a coalition so that a more efficient program can be developed. This coalition would also eliminate duplication of effort in the study arena. The "revamped" program would insure that the limited monetary, equipment, and personnel assets are being fully exploited to produce and distribute the most accurate data on ammunition requirements for the Army.

**DAT
ILM**