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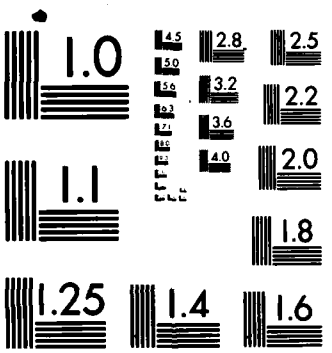

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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STUDY PROGRAM MANAGEMENT OFFICE
DCSA

SEPTEMBER 1985

ARMY STUDY HIGHLIGHTS

VOLUME VI

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF STAFF
WASHINGTON, D.C. 20310

DACS-DMO 17 September 1985

SUBJECT: Army Study Highlights

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1. Volume VI of the Army Study Highlights is the sixth in the series spotlighting recently completed high-quality Army studies.

2. The purpose of the series is to widely publicize good studies, encourage excellence in the Army analysis community, and give visibility and credit to deserving individual analysts.

3. The studies selected are examples of efforts that are technically and professionally well done and are of significance to the Army's roles and missions. I urge you to make the widest possible distribution of this report throughout your organization. There are lessons to be learned in reviewing these well done studies that can help improve analysis Army-wide.

4. Comments and suggestions about Army Study Highlights can be made to Ms. Gloria Brown of this office, AV 227-0026 or (C) (202) 697-0026. Additional copies of the report are available from Ms. Brown.

JOANN H. LANGSTON, SES, Director
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STUDY PROGRAM MANAGEMENT OFFICE
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STUDY GISTS

COST ANALYSIS OF FTS VERSUS COMPARATIVE WATS SERVICE AT SELECTED ARMY CONUS LOCATIONS (U)

THE PRINCIPAL FINDINGS of the work reported herein are as follows:

(1) Wide Area Telephone Service (WATS) is less expensive than the Federal Telecommunications System (FTS) in most cases.

(2) Army telephone systems lack basic controls over misuse and abuse.

(3) Installation of Least Cost Routers (LCR) will facilitate optimum use of available telephone trunking.

(4) The current split of responsibility for CONUS long distance telephone services between two subcommands is not conducive to the effective management of the telephone system.

THE MAIN ASSUMPTIONS on which the work reported herein rests are as follows:

(1) The impact of the divestiture of AT&T and the deregulation of the telephone industry will affect FTS and WATS equally.

(2) The 20 percent sample of FTS telephone traffic that was provided by the General Services Administration (GSA) is representative of all FTS telephone traffic.

(3) FTS telephone traffic is reasonably constant over time. Variations in traffic levels from week to week and month to month are negligible.

THE PRINCIPAL LIMITATIONS of this work which may affect the findings are as follows:

(1) The current lack of LCR's precludes optimum use of telephone trunking.

(2) Most Army telephone systems do not have the hardware that is needed to collect and synthesize traffic statistics from which the optimum mix of telephone trunks can be determined.

THE SCOPE OF THE STUDY. This study:

(1) Translated FTS telephone traffic into equivalent commercial WATS traffic and determined the numbers of trunks that would be required to carry the traffic.

(2) Compared the costs of FTS and WATS at 10 Army installations. All 10 installations are relatively large users of FTS.

THE STUDY OBJECTIVES. The objective of the study was to determine if commercial services were available that could provide the same quality and grade of service as FTS at a lower cost.

THE BASIC APPROACH.

(1) This study was accomplished by developing and utilizing an automated model that translates historical FTS detailed call records into equivalent WATS traffic and costs the traffic using WATS tariffs.

(2) FTS call records were obtained from GSA for 10 Army installations. The call records were a 20 percent sample of the total traffic at the installations and were provided on magnetic tape. An automated model was developed that sorts the call records by geographical location of the called party and summarizes the information into WATS bands. Once all the traffic originating at a given installation has been read and summarized, the busy hour traffic level is determined and that statistic is used in the calculation of the number of trunks required to carry the traffic. Average traffic load per trunk is then determined and is costed using current AT&T WATS tariffs.

(3) The study was simplified and biased in favor of FTS by using the band 5 WATS tariff to cost all interstate traffic and the tariff authorized by the state of origination for intrastate traffic. Band 5 WATS can be used to carry any interstate traffic and is the most expensive of the interstate WATS services. In practice, the optimum combination of WATS bands 1 thru 5 would be used for interstate traffic and the resulting cost would be lower than the WATS costs used in the study.

(4) Since completion of the study, GSA has raised the rate the Army pays for FTS usage significantly and the interstate WATS tariffs have decreased slightly. Traffic has been analyzed for additional Army sites with results indicating that use of WATS or equivalent commercial services will result in significant savings at most Army installations.

THE REASONS FOR PERFORMING THE STUDY.

(1) The cost of Army usage of FTS has increased dramatically over the past several years.

(2) Data gathered during program evaluations of Defense Metropolitan Area Telephone Systems indicated that WATS might be less expensive than FTS.

THE STUDY SPONSOR was the U. S. Army Information Systems Command (USAISC).

THE PERFORMING ORGANIZATION was the Systems & Economic Analysis Division, Comptroller USAISC. Authors were Joe McCoy, Robert Priest, and Dale Lyall.

DTIC ASSESSION NUMBER: DA307541

COMMENTS AND QUESTIONS MAY BE SENT TO:

HQ, USAISC
AS-OC-SAS
Fort Huachuca, AZ 85613-5000

Point of Contact is Dale Lyall, AUTOVON 879-6688.

THE IMPACT OF THE STUDY

(1) The study recommendations cannot be fully implemented until LCR hardware is available. The hardware will be procured over the next several years. Savings are expected to exceed $10M annually when the study recommendations are fully implemented.

(2) In addition to determining that FTS is not always the least costly long distance telephone service, the study exposed some areas of FTS abuse such as large volumes of night and weekend calling. Use of intrastate WATS and foreign exchange services at a few locations and efforts to control abuse by limiting access to FTS during nonduty hours has resulted in significant savings (approximately $60K monthly at Fort Knox, KY alone).

DEPARTMENT OF THE ARMY
US ARMY TROOP SUPPORT COMMAND
NATICK RESEARCH AND DEVELOPMENT CENTER
NATICK, MA

FIELD FEEDING SYSTEM TO SUPPORT USMC IN THE 1990s

THE PRINCIPAL FINDINGS

(1) Defined new field feeding system which supports the USMC's combat role of the 1990's and which increases the frequency and acceptability of hot meals provided.

(2) Compared to the USMC's current field feeding system, the new system offers a 66% reduction in personnel requirements, a 73% reduction in water requirements, and a 94% reduction in fuel requirements.

(3) For a Marine Amphibious Force (MAF) size force (strength 45,000), the new system offers a minimum $15M annual cost savings.

THE MAIN ASSUMPTIONS

Systems analysis and design are based on the II MAF which represents a cross section of the USMC's field feeding requirements.

PRINCIPAL LIMITATIONS

None. Data utilized for the study were drawn from large scale exercises in Norway, Vermont, and California.

SCOPE OF THE STUDY

The scope of the study was to define a field feeding system from state-of-the-art technology which could better support all USMC task forces in the 1990s. All systems analyses and designs were done for a MAF size task force, the largest Marine Air Ground Task Force (MAGTF), from which units are drawn for all smaller sized task forces.

STUDY OBJECTIVES

(1) Evaluate relevant emerging technologies.

(2) Define proposed new system.

(3) Evaluate projected costs and benefits of the proposed system.

(4) Conduct field evaluations of new system technology demonstrators to validate system performance and benefits.

THE BASIC APPROACH

The USMC's combat roles, concepts of operation, and missions for the 1990s were analyzed to determine the required responsiveness, mobility, and flexibility characteristics for a new improved field feeding system. A new system with these characteristics was defined. Then for the II MAF, both the current and proposed new field feeding systems were evaluated relative to personnel requirements (food service personnel and KPs), water and fuel requirements, logistical impacts, and total system costs (personnel, rations, equipment, transportation, water, fuel, disposables). A series of field evaluations of new system technology demonstrators (built under contract) was then conducted from which extensive data was collected to validate new system performance and benefits.

REASON FOR PERFORMING THE STUDY

Requested by USMC HQ Code LFS-4 for the Marine Corps Development and Education Command as a high priority funded project in the DoD Food and Nutrition Research and Engineering Program.

STUDY IMPACT

The new field feeding system will reduce personnel requirements by 66%, water requirements by 73%, and fuel requirements by 94% when implemented. These savings result in a minimal $15M reduction in annual costs.

STUDY SPONSOR

Development Center
Marine Corps Development and Education Command
Quantico, VA

STUDY EFFORT

Project Officer:

Harry Kirejczyk
Directorate for Systems Analysis and Concept Development
U.S. Army Natick R&D Center

COMMENTS AND QUESTIONS

U.S. Army Natick R&D Center
Directorate for Systems Analysis and Concept Development (STRNC-O)
AV 256-4673

DTIC ASSESSION NUMBER: ADA148953.

CAA	MEASURING IMPROVED CAPABILITIES OF ARMY FORCES (MICAF) STUDY (U)	STUDY SUMMARY CAA-SR-84-20

THE REASONS FOR PERFORMING THE STUDY. Army modernization programs are underway which will improve the Army's combat capabilities. At the present time, no system exists to measure, report, and monitor this increased capability. The MICAF Study was initiated to correct this problem.

THE PRINCIPAL FINDINGS of the work reported herein were:

(1) A process for measuring changes in potential combat capabilities has been developed and demonstrated for armored, mechanized infantry, and infantry divisions for FY 80-84.

(2) From FY 80 to FY 84, the total combat potential for the 24 divisions increased by 18 percent. The percentage of contribution to the total combat potential by type (armored, mechanized, or infantry) division remained relatively constant during the 5-year period despite decreases in the total number of maneuver battalions within the force.

(a) The seven mechanized infantry divisions increased their total potential by 21 percent from FY 80 to FY 84 while the six armored divisions increased by 20 percent. The 11 infantry divisions reflect an 11 percent increase for the 5-year period.

(b) The 16 Active Component divisions had a 17 percent increase in combat potential for FY 80 to FY 84; the 8 National Guard divisions increased by 20 percent.

THE MAIN ASSUMPTIONS

(1) Equipment used by US and opposing forces will be operated by adequately trained personnel.

(2) For the purpose of assessing combat potential, divisional combat can be represented by many, largely independent, weapon type-on-weapon type duels.

(3) All 24 divisions included in this study will engage a stylized 1984 threat force in Central Europe.

THE PRINCIPAL LIMITATIONS

(1) A division's potential and the individual weapon potentials will change significantly if the scenario, force composition, or threat force are changed; therefore, the potentials represented in this report should only be used for relative comparisons to other potentials developed under similar conditions.

(2) Computed potential combat capabilities are based principally on selected major items possessed by an organization; shortages of spare parts, lack of training, or other limitations to achieving full potential are not reflected in the estimate of potential capabilities.

(3) The MICAF methodology is sensitive to equipment inventories but not to different organizations with the same inventory.

(4) The measurement process considers sustainability only from a near-term perspective of the capabilities within the division to perform selected combat support/combat service support (CS/CSS) activities.

THE SCOPE OF THE STUDY was to develop and demonstrate a process for estimating the quantitative changes in potential combat capabilities as the modernization of Army forces progresses. The Executive Summary contains the study methodology and major observations.

THE STUDY OBJECTIVES were to:

(1) Develop a procedure that employs an analytically-based, quantitative method to estimate changes in force capabilities resulting from the introduction of new items, units, and organizations.

(2) Demonstrate application of the reporting procedure for the 24 divisions in the total Army from FY 80 to FY 84.

THE BASIC APPROACH was, first, to develop a list of the type and quantity of US and threat divisional equipment. Item characteristics, such as single shot kill probabilities, were used as inputs to a duel-oriented computational process. Exchange ratios were estimated from the results of weapon type-on-weapon type duels in each of 16 different combinations of environmental conditions and tactical operations. These estimates were adjusted to reflect divisional CS/CSS resources. Weighting factors were applied based on the expected frequency of environmental/tactical operation combinations to develop the combat organizational potential. Computation and display of the potentials for all Army divisions at successive points in time provides an indication of the change in capabilities of the Army resulting from the introduction of new items or units.

THE STUDY SPONSOR was the Director for Operations, Readiness, and Mobilization, ODCSOPS.

THE STUDY EFFORT was directed by Mr. Joseph E. Koletar, Jr., for Measuring Improved Capabilities of Army Forces (MICAF) Phase I; MAJ John Justice directed MICAF Phase II; and Mr. Gerald E. Cooper directed The Analysis of Force Potential (AFP) Study.

COMMENTS AND QUESTIONS may be sent to the Director, US Army Concepts Analysis Agency, ATTN: CSCA-RQ, 8120 Woodmont Avenue, Bethesda, MD 20814-2797.

DTIC ACCESSION NUMBER: AD F860021L

The impact of the MICAF Study has been in the capability it provides to measure the increased combat potential of Army units due to major weapon systems acquisitions and modernization. This capability is used by the Army leadership to support responses to inquiries and to defend Army programs before Congress.

CAA	MID-RANGE FORCE STUDY--CY 84 (MRFS-84) (U)	STUDY SUMMARY CAA-SR-85-2

THE REASONS FOR PERFORMING THE STUDY were:

(1) To support development of the 1994 Army Planning Force for the Joint Strategic Planning Document (JSPD).

(2) To support development of the 1991 Objective Force and the 1992-2001 Extended Planning Annex (EPA) Objective Force for The Army Plan (TAP).

THE PRINCIPAL ACCOMPLISHMENTS of the work reported herein are:

(1) Provision of alternative forces for evaluation in the selection of the 1994 Planning Force, and the 1991 Objective Force.

(2) Estimation of the resources necessary to field the 1992-2001 EPA Objective Force.

THE MAIN ASSUMPTIONS used by this study were:

(1) The projected Army total obligation authority was valid.

(2) The stylized force modules used in the design model realistically represented the characteristics of actual forces.

(3) The program force would evolve as projected in the Program Objective Memorandum (POM).

(4) Estimated maximum production rates and costs of new equipment were accurate.

PRINCIPAL LIMITATIONS of this work which may affect the findings were that the methodology addresses only the division forces of the Army and does not include the general support or special mission forces. Data are only as valid as the projections for 1990 and beyond. The methodology is restricted to conventional warfare forces. The measures of effectiveness primarily emphasize resource requirements and firepower potentials. Military judgment is required in order to consider the many nonmodeled combat effectiveness characteristics not included in those categories.

THE SCOPE OF THE STUDY was an analysis of the capabilities and resource requirements of the operational forces (Active and Reserve Components) in the context of the Global Force Planning Scenario and Assumptions. Each force was defined in terms of force structure, readiness, modernization, and sustainability.

THE STUDY OBJECTIVES were:

(1) To provide specified requirements analyses for use in establishing general purpose Army planning forces for development of the FY 1987-1994 Joint Strategic Planning Document.

(2) To provide analysis and alternatives for the 1991 Objective Force for publication in The Army Plan, 1987-2001.

(3) To provide estimates of the resources necessary to field the FY 1992-2001 EPA Objective Force.

THE BASIC APPROACH for this study can be described as follows: a Base Case force structure was developed to determine data base elements and constraints for the Force Design Model (FDM). The structure, defined in terms of stylized division, nondivisional combat, and tactical support increments, was described by readiness, modernization, sustainability, and resource consumption. Using the FDM, conceptual forces were designed or compared in terms of forward edge of the battle area (FEBA) index values and resource use.

THE STUDY SPONSOR was the Deputy Chief of Staff for Operations and Plans (DCSOPS), DAMO-SSW, HQDA, who established the objectives and monitored study activities.

THE STUDY EFFORT was directed by Mr. Charles F. Horton, Strategy, Concepts and Plans Directorate.

COMMENTS AND QUESTIONS may be directed to the Director, US Army Concepts Analysis Agency, ATTN: CSCA-SP, 8120 Woodmont Avenue, Bethesda, MD 20814-2797.

Impact: The Planning Force was used to define the U.S. Army Force necessary to meet national military objectives. It was adopted by the Joint Chiefs of Staff and incorporated into the Defense Guidance signed by the President. The Objective Force was incorporated into the Army Plan (TAP) and served as the basis for the FY 92 Program Force.

DTIC ACCESSION NUMBER: AD F860027L

PERSHING II FOLLOW-ON TEST: SIZE REDUCED BY SEQUENTIAL ANALYSIS (U)

PRINCIPAL FINDINGS. In determining the size of a sample to be tested, to inform of the success or failure of an entity to maintain reliability within given limits, not only is Fisher's Exact Test inappropriate, but there exist Bayesian methods of sequential sampling which can provide the desired information to the same confidence level, and with a savings in the number of items sampled. For the particular case of the Follow-On Test of Pershing II, it appears that the JCS criteria for reliability declarations can be met with an annual test size of about 10 missiles expended, instead of the 12 missiles of Pershing IA.

MAIN ASSUMPTIONS. The total size of the annual test of Pershing IA might be said to have been larger than 12 because, for example, some of the tests conducted by the FRG could be amalgamated with the U. S. shots. Still, the two different methods employed in the study reached essentially a common conclusion as given above.

PRINCIPAL LIMITATIONS. This was a strictly mathematical analysis. Of the two treatments of the problem, one is polished and on firm ground, though the authors believe another approach would be better (Kalman filter); while the other breaks new ground and is exciting for its possibilities, though some important theorems remain unproven.

SCOPE OF THE STUDY. This study focused on reliability, only one of the pieces of information required by the JCS in their annual evaluation of the system. It did not consider troop training, major program modifications and other possible reasons for additional missile firings or for acquiring an inventory of missiles.

STUDY OBJECTIVES. The primary objective of the study was to find a rigorous way of extracting as much information as possible from a test sequence so as to minimize the cost of knowledge at a given level of accuracy. A secondary objective was to show that such a way was not difficult to carry out.

BASIC APPROACH. The author called on the Army Mathematics Steering Committee (Dr. Jagdish Chandra, Chairman) to engage statisticians of repute, not previously associated with the Pershing program. He frequently met with or communicated with these people to clarify the problem statement and to discuss progress and problems. Because of the novelty of some of the mathematics, he also developed some computer codes for a hand-held calculator. The report consists of the work of the contributing statisticians embedded in analyses by the author. The bibliography and references contain the major findings of his literature search (the product of over thirty years of interest in Bayesian statistical methods).

REASON FOR PERFORMING THE STUDY. The study was undertaken because the prior methods of computing missile test requirements were of doubtful scientific validity, and also tended to be obscured by even less precise arguments for missiles for troop training.

STUDY SPONSOR. The study was undertaken at the request of the Under Secretary of the Army.

STUDY AGENCY AND AUTHORS. The study was performed by Daniel Willard, Office of the Deputy Under Secretary of the Army (Operations Research). Contributing authors were (1) Dr. Robert Launer (Army Research Office, Research Triangle) and Dr. Nozer Singpurwalla (George Washington University) and (2) Dr. Michael Woodroofe (University of Michigan).

IMPACT ON THE ARMY. Application of the recommendation of the study will save the Army $9 million per year. Extension of the results of the study to other dichotomous tests could save the Army additional funds, could indeed provide savings elsewhere in DOD and beyond.

The report will be submitted to DTIC after incorporating referees' comments.

Comments and questions should be sent to:

a. Department of the Army
SAUS-OR
20310-0102

b. Attention: D. Willard

c. AUTOVON: 227-0280

d. Or to the contributing authors.

	SHELTER MIX REQUIREMENTS (KEY US INDUSTRIAL WORKERS)	STUDY GIST

THE PRINCIPAL FINDINGS:

(1) The computer model developed which minimizes unused shelter spaces is a rational and acceptable way to generate detailed shelter mix requirements and gross costs for a nationwide program.

(2) Current Standard Industrial Code (SIC) definitions need to be refined so that output of specific local industries can be identified.

(3) Data bases available to and used by the Federal Emergency Management Agency (FEMA) are out of date, incomplete, and inaccurate.

(4) The standard mix of shelter sizes should include 20- and 50-person shelters in addition to 100-, 250-, 500-, and 1,000-person shelters.

THE MAIN ASSUMPTIONS:

(1) Nuclear blast shelter protection will be provided only for key industrial workers and emergency personnel.

(2) All keyworkers within a scenario generated, 2-PSI overpressure contour will be provided blast shelter protection.

(3) There will be at least 30-minutes warning before a nuclear attack providing time to travel to shelters.

(4) Plants manufacture only the primary product identified by the assigned SIC.

(5) The FEMA Crisis Relocation and Protection of Industrial Capability plans will be effective.

THE PRINCIPAL LIMITATIONS: The model generates shelter requirements for each plant that has keyworkers producing a vital SIC product. The precise geographic location of each plant was unknown. Thus, the economies to be gained by having larger shelters shared by plants in close proximity are not addressed. The effects are to generate more smaller sized shelters and higher national program costs. The model can accommodate precise location data if the FEMA data bases are updated to that level of resolution.

THE SCOPE OF STUDY: This study:

(1) Developed a computer model to estimate the best mix of sizes for keyworker blast shelters and provided model to sponsor.

(2) Tested the model using data based on the TR-82 scenario for three high-risk conglomerates.

(3) Critiqued FEMA data bases available and identified improvements needed.

(4) Developed specific initiatives that FEMA should undertake to improve the accuracy of shelter mix and cost estimates.

THE STUDY OBJECTIVES: The basic objective of this study was to develop and apply an analytic model that would optimize the number and sizes of blast shelters that are to be constructed in high-risk areas.

THE BASIC APPROACH:

(1) During a crisis relocation, production will continue, at reduced levels, at plants producing items vital to the nation's survival and defense. This study considered required levels of item production in each conglomerate and the minimum workforce (i.e., keyworkers) needed to achieve that production. The model assigns keyworkers to shelters based on plant location and maximum peacetime workforce. Mobilization and non-mobilization scenarios were used.

(2) In each scenario the model generates results calculated for CEP 1 and CEP 3. These two CEP levels bracket reasonable levels of confidence that planners might use. Shelter sizes are calculated to accommodate keyworkers for all required production at plants in the 2 PSI and greater region.

(3) The model was tested using data for three conglomerates. Excursions were run to test the sensitivity of model output to the major assumptions. At each step in the process, input data was evaluated for currency, accuracy, and completeness.

REASONS FOR PERFORMING THE STUDY: Mr. Bernard A. Maguire, Associate Director of National Programs, FEMA, requested (in a 28 June 83 letter to LTG Joseph K. Bratton, Chief of Engineers) that ESC develop and apply an analytic model to determine number and sizes of blast shelters; no comparable methodology existed. The Corps of Engineers was also vitally interested in determining the scope of its mobilization construction mission requirements.

SPONSOR: Associate Director of National Programs, Federal Emergency Management Agency

IMPACT OF STUDY: The model developed provides FEMA the means to determine shelter mix requirements given any appropriate scenario or mobilization condition. The study also provided focus to FEMA's data base development and improvement needs. Impact is immediate and will have long term utility in formulation of national Protection of Industrial Capability program.

PERFORMING ORGANIZATION AND PRINCIPAL AUTHORS: The performing organization was the US Army Engineer Studies Center (ESC). The principal author was Mr. Lyle G. Suprise.

DTIC ACCESSION NUMBER of the final report is B084489L

COMMENTS AND QUESTIONS MAY BE SENT TO: (1) US Army Engineer Studies Center, Casey Building #2594, Ft Belvoir, VA 22060-5583; (2) POC: Mr. Lyle G. Suprise; (3) AUTOVON 345-2126

CAA	UNIT REPLACEMENT SYSTEM ANALYSIS IV (URSA IV)	STUDY SUMMARY CAA-SR-85-5

THE REASON FOR PERFORMING THE STUDY was to assist the Office of the Deputy Chief of Staff for Personnel (ODCSPER) in the analysis of a unit movement plan for the New Manning System.

THE PRINCIPAL FINDINGS of this study are:

(1) The policies of the Original COHORT (cohesion, operational readiness, and training) Battalion Movement Plan do not permit the maintenance of strength profiles in rotating battalions at or above minimum specified readiness criteria.

(2) Adjustments to the assignment policies of the Original COHORT Battalion Movement Plan which would permit the maintenance of minimum readiness criteria could not be identified.

(3) The policies of the Modified COHORT Battalion Movement Plan, including "platoon package" first-termer refill, and 9-month careerist assignment windows, do permit the maintenance of strength profiles in rotating battalions at or above minimum specified readiness criteria during most of the battalions' life cycle.

(4) Extraregimental assignment (ERA) pools can generally be maintained at or above the 70 percent strength level.

(5) Under the policies of both the Original and Modified COHORT Battalion Movement Plans, turnover patterns in the rotating battalions demonstrate the concentration of turnover at predictable points in the unit's life cycle and a significant reduction in turnover between these points.

THE MAIN ASSUMPTIONS upon which this study was based are:

(1) The authorization data provided by the sponsor is accurate, and the Army will be manned to that authorization.

(2) The system is operating in a steady-state peacetime condition and will not be subject to major dislocations such as restationing of units and the activation or deactivation of units.

(3) The allocation methodology used to distribute extraregimental positions among the regiments will be used in the process of affiliating soldiers with regiments.

THE PRINCIPAL LIMITATIONS of the work which might affect the findings are:

(1) Analysis was limited to enlisted personnel authorizations in career management field (CMF) 19.

(2) The armor regimental structures used in the analysis did not include any replacement units; therefore, the long-tour replacement company and short-tour replacement unit characteristics of the movement system were not analyzed.

(3) Attrition and promotion rates for careerists were developed for each regiment to ensure compliance with the assumption that the Army, and each regiment, will be manned, by grade and military occupational specialty (MOS), to its authorized level. Grade imbalances within individual regiments resulting from Army-wide attrition and promotion rates were not considered in the primary analysis.

THE SCOPE OF THE STUDY was a steady-state analysis of the sustainability of the COHORT Battalion Movement Plan operating within the armor regimental structure of the Army Regimental System.

THE STUDY OBJECTIVES were to:

(1) Describe and compare the personnel readiness indicators of regimental units and extraregimental assignment pools operating under the COHORT Battalion Movement Plan and an Individual Replacement Plan.

(2) Identify adjustments to Original Movement Plan policies to permit units and ERA pools to maintain prescribed personnel readiness levels.

(3) Describe the effect of Modified Movement Plan policies on the unit's and ERA pool's capabilities to maintain prescribed personnel readiness levels.

THE BASIC APPROACH followed in this study was to define the ERA structure of the 17 proposed armor regiments by distributing extraregimental assignment spaces among regiments using a sequential linear goal programing model. The personnel flow patterns within these regiments were then analyzed using a computer simulation model to assess the capability of regimental units and ERA pools to maintain prescribed personnel readiness levels while operating under specific personnel and unit movement policies.

THE STUDY SPONSOR was the Office of the Deputy Chief of Staff for Personnel (ODCSPER).

THE STUDY EFFORT was directed by LTC Charles L. Frame, Force Systems Directorate.

COMMENTS AND QUESTIONS may be sent to the Director, US Army Concepts Analysis Agency, ATTN: CSCA-FS, 8120 Woodmont Avenue, Bethesda, MD 20814-2797.
AV 295-1659/1682

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IMPACT ON THE SPONSOR. As part of the implementation of the New Manning System, ODCSPER is responsible for the development, testing, and analysis of the battalion rotation concept. URSA IV provided a detailed analysis of the effect of the primary personnel policies of the battalion rotation concept on the ability of regimental units to maintain desired strength levels. URSA IV first assisted ODCSPER in the identification of those personnel policies of the original rotation concept which would not permit units to maintain desired strength levels. Subsequently, the study assisted in the development of a set of policies which would permit the achievement of acceptable unit strengths. These policies, as developed and analyzed in URSA IV, are being implemented by ODCSPER to form, sustain, and rotate the eight COHORT battalions which will participate in the field testing of the battalion rotation concept beginning in FY 85. Upon successful completion of field testing, these policies will be implemented Army-wide as an integral part of the New Manning System.

	US ARMY ENGINEER DIVISION, EUROPE (EUD) ORGANIZATION STUDY	STUDY GIST

THE PRINCIPAL FINDINGS of the work reported herein are as follows:

(1) Rapid growth in personnel and workload were straining the existing organization structure.
(2) The point of diminishing returns had been reached for making minor organizational changes.
(3) Several problems identified in the report could be solved by making organizational changes.
(4) The traditional USACE Division HQ with operations performed by decentralized districts is recommended for EUD unless the workload decreases.
(5) Program/Project Management (Cradle-to-Grave) concepts could be applied in EUD.

THE MAIN ASSUMPTIONS on which the work reported herein rests are as follows:

(1) Different organizational structures are permitted for peacetime and wartime operations.
(2) The March 1984 TDA was used as the baseline organization structure, and no more than a 10% increase in personnel was permitted.
(3) No major changes in peacetime missions.
(4) No significant decrease in design and construction workloads in the FY 84 - FY 87 time period.
(5) EUD would continue to operate in the "indirect contracting" mode.

THE PRINCIPAL LIMITATIONS of this work which may affect the findings are as follows:

(1) Attempting to undergo a major reorganization while executing a large design and construction workload could cause major work stoppages in the European construction program.
(2) Senior managers who were developed under the separate Engineering and Construction functions within the Corps of Engineers are not likely to favor the consolidated project management approach.
(3) It is very difficult to quantify tangible performance savings or benefits when the proposed organizational realignment may take a year or more to be implemented.

THE SCOPE OF THE STUDY: This study:

(1) Examined the US Army Engineer Division, Europe to include the operating Division HQ located in Frankfurt and its field offices--8 area offices, (6 located throughout West Germany, 1 in the Netherlands, and 1 in Turkey), and 2 resident offices (located in Greece and Italy).
(2) Used existing TDA (approx. 1100 spaces) as baseline organization structure.
(3) Developed an integrated Program/Project Management concept.

THE STUDY OBJECTIVES: The principal objectives of this study were to: assess the existing operating division organization structure, identify problem areas, and make recommendations which would improve performance in the peacetime environment (primary emphasis was placed on this aspect), as well as in the transition to and performance in a wartime mode.

THE BASIC APPROACH: The study effort began with literature searches, review of past EUD realignment efforts and pertinent regulations. Extensive on-site interviews and workshop sessions were held with EUD staff and Study Advisory Group (SAG) members. ESC and the SAG identified major organizational goals and used a relatively new analysis technique--the Analytical Hierarchy Process--to prioritize these goals. Interview results were used to develop major problem areas within EUD. Several organizational alternatives were developed and presented to the SAG. The options were reduced from 9 to 4 to 2 and finally to the recommendation. All options were evaluated by ESC based on how well they would help EUD meet its goals and on how well they would resolve the identified problems. The study report packaged major options and topics as separate annexes.

THE REASONS FOR PERFORMING THE STUDY: MG Scott B. Smith, EUD Commander, requested (in a 13 April 1984 letter to the Chief of Engineers) that ESC conduct an organizational assessment of EUD; he wanted an independent, objective evaluation performed. No comparable study existed.

SPONSOR: The sponsor was the US Army Engineer Division, Europe.

IMPACT OF STUDY: The ESC report had several impacts for EUD and USACE.

(1) It was the catalyst for forcing EUD Senior Managers to focus on corporate rather than functional area goals and problem areas. This process indirectly improved internal communication and formed the basis for improvements.

(2) It provided the Senior Management staff at EUD with a range of options that could be implemented separately or sequentially--it is an on-the-shelf blueprint for organizational change.

(3) It provided EUD and USACE with a tool that can be used in future years to prioritize goals and problem areas.

(4) It was distributed to USACE Divisions worldwide to promote "cradle-to-grave" project management as an alternative to the traditional construction management approach.

PERFORMING ORGANIZATION AND PRINCIPAL AUTHORS: The performing organization was the US Army Engineer Studies Center (ESC). The principal authors were Mr. Donald W. Spigelmyer, Dr. Lawrence A. Lang, Mrs. Jean A. Lamrouex, and Mr. Pleasant P. Mann.

DTIC ACCESSION NUMBER of the final report is ADB092632.

COMMENTS AND QUESTIONS MAY BE SENT TO: (1) US Army Engineer Studies Center, Casey Building #2594, Ft Belvoir, VA 22060-5583; (2) POC: Dr. Lawrence A. Lang; (3) AUT: 345-2283

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