LEVEL II

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STUDY PROJECT

MAY 1980

ENGINEER PROFESSIONAL DEVELOPMENT STUDY

by

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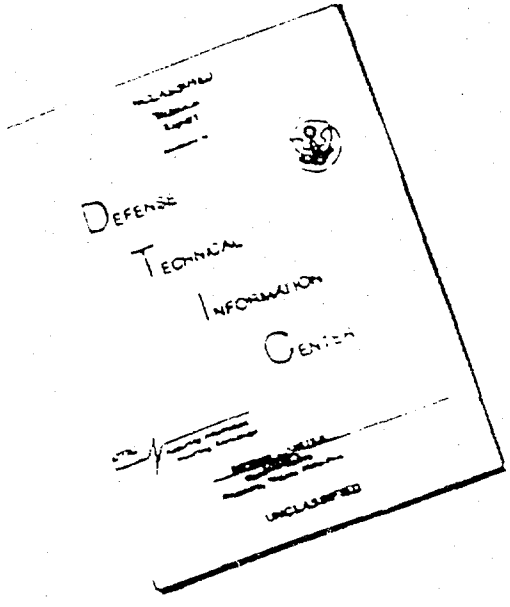

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The basic question is whether OPMS, as presently executed, is properly developing engineer officers to maximize their individual and collective strengths to meet the increasingly complex requirements and needs of the Army. The basic premises of OPMS are evaluated to include the demographic model used to describe the population to be managed and the rationale of dual/parallel skill development. Data was gathered using literature search, conducting interviews, purging 1972 original briefing notes and screening ORB's. Research indicates that OPMS, as presently executed, has permitted

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USAWC MILITARY STUDIES PROGRAM PAPER

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ENGINEER PROFESSIONAL DEVELOPMENT STUDY.

(9) GROUP STUDY PROJECT (12)

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ABSTRACT

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PREFACE

This Group Study Project was produced at the request of Specialty Code 21 Personnel Managers assigned to the Military Personnel Center with the cooperation of the Office of the Chief of Engineers. The perception exists by some senior officers in the Corps of Engineers that the Officer Personnel Management System does not provide training opportunities in the field of construction management sufficient to qualify senior engineer officers to be district or division engineers. This Group Study Project conducted by seven engineer officer AWC students with varied backgrounds examines this perception and extends the purpose of the study to the development of a general growth model for engineer officer professional development.

SPECIAL CREDIT

Data contained herein were provided exclusively by MILPERCEN from pertinent data bases, ORB screens, and other internal sources.

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ABBREVIATIONS

ACSI	Assistant Chief of Staff for Intelligence
ARR	Army Readiness Regions
AUS	Army of the United States
BA	Bachelor of Arts
BN	Battalion
CAS^3	Combined Arms and Services Staff School
CERC	US Army Corps of Engineers Coastal Engineering Research Center
CERL	US Army Corps of Engineers Construction Engineering Research Laboratories
CGSC	Command and General Staff College
CITA	Commercial-Industrial-Type-Activity
CM	Contract Management - Construction and Facilities Maintenance
COE	Chief of Engineers
CRREL	US Army Corps of Engineers Cold Regions Research and Engineering Laboratory
CY	Calendar Year
DA	Department of the Army
DAMPL	Department of the Army Master Priority List
DE	District Engineer
DEH	Director of Engineering and Housing
DFAE	Director of Facilities and Engineering
DMA	Defense Mapping Agency
DOD	Department of Defense
DOPMA	Defense Officer Personnel Management Act
EN	Engineer (Branch Designation)
EOAC	Engineer Officer Advanced Course
EOBC	Engineer Officer Basic Course
ETL	US Army Corps of Engineers Engineer Topographic Laboratory
FE	Facilities Engineer
FY	Fiscal Year
INSCOM	US Army Intelligence and Security Command
LOC	Lines of Communication
MILPERCEN	Military Personnel Center
MS	Master of Science
OCE	Office of the Chief of Engineers
OFMP	Officer Force Management Plan
ODP	Officer Distribution Plan
OPMD	Officer Personnel Management Directorate
OPMS	Officer Personnel Management System
ORB	Officer Record Brief (DA Form 4037)
OTRA	Other Than Regular Army
PCS	Permanent Change of Station
PE	Professional Engineer; Registered Professional Engineer
PERSACS	Personnel Structure and Composition System
RA	Regular Army
R & D	Research and Development
ROTC	Reserve Officer Training Corps
SC	Specialty Code
SSC	Senior Service College

THS	Transient, Holding and Student (Personnel Account)
TRADOC	US Army Training and Doctrine Command
USAREC	US Army Recruiting Command
USAREUR	US Army Europe
USMA	US Military Academy
WES	US Army Corps of Engineers Waterways Experiment Station
WESTCOM	US Army Western Command
W/O	Without
YG	Year Group

CHAPTER I

ENGINEER PROFESSIONAL DEVELOPMENT STUDY
BACKGROUND REPORT ON STATUS QUO

In 1972, personnel management of the officer was transitioned from 14 traditional, vertically managed branches of the Army to a concept which designated a multitude of notional specialty pairings. This new concept, Officer Personnel Management System (OPMS), like its vertically oriented predecessor, was horizontally designed to develop the right numbers of officers in the proper grades with the requisite skills to meet Army requirements. In the review that follows one must recognize that OPMS as a total system is still evolving and that policies and operating procedures are being refined with a goal toward achieving consistent, long term growth objectives as the force matures.

Recent trends within the Engineer Specialty (SC21) have prompted the Chief of Engineers and the Commander, MILPERCEN to question whether OPMS is developing the right numbers of engineer officers with the requisite skills to meet Army requirements. This study examines that proposition by focusing on four critical aspects of a management system that, of necessity, must be requirements driven.

- What is expected of the military engineer? How does the officer support the Army? the Nation?
- What tradeoffs, if any, should be considered as the military engineer officer corps is developed?
- Are there any recognizable shortcomings that can be translated into or predicted to become management or leadership risks?
- What adjustments to the present growth model, if any, should be considered?

A working understanding of the underlying precepts of OPMS is fundamental to assessing the impact of the analysis contained in Chapter 2 of this report. It is not the intent of this study effort to challenge OPMS, but simply to outline the concept as originally envisioned, report on the present status quo as best it can be defined and make some recommendations for fine tuning OPMS toward improving both the personnel management and personal and professional growth systems for the 1980s.

OPMS--BACKGROUND

Conceptually OPMS is simple. As outlined in a special edition of DA Pamphlet 360-84: "OPMS Status Report," OPMS purpose is three-fold:

- satisfy Army requirements.
- enhance officer professionalism.
- provide officer job satisfaction.

It is the basis for developing the professional qualifications of officers to maximize thei. opportunities to contribute to the Army and the nation.

As the original OPMS Steering Group obtained a more comprehensive understanding of Army requirements and the demands placed on the officer corps, it became evident that as an officer progressed in rank, the opportunity to serve in positions requiring utilization of traditional branch skills decreased sharply (Figure 1-1). The most dramatic decline classically occurs in the maneuver branches where, as shown below, branch specific jobs at O-6 ranged around 10 percent. Professional development of such a population dictated radical methods to increase the level of competence and consequently levels of contribution of the officer corps outside the combat arms' career fields.

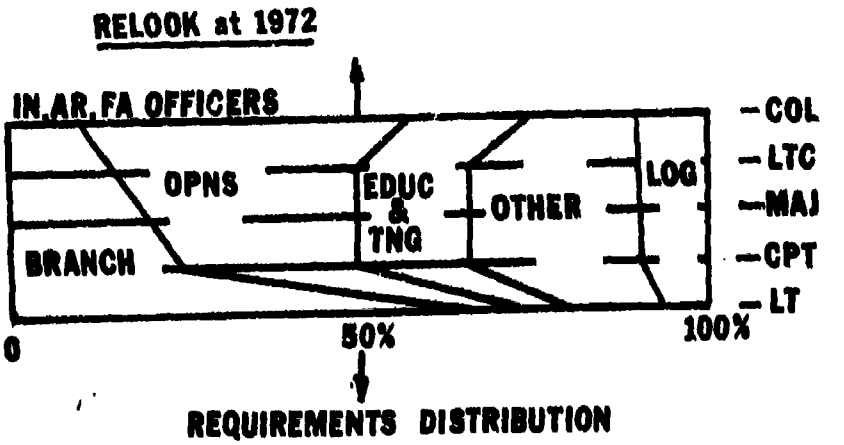


Figure 1-1

The combat support branches, by contrast, had sufficient requirements within branch specialties to permit the majority of their officers to choose multiple areas of concentration within an already broad branch career field (Figure 1-2). To require all of these officers to develop a second skill out of branch would serve to dilute their branch expertise. This population presented an entirely different challenge to the personnel managers: that of generating a sufficient number of opportunities to cross-fertilize out of branch and avoid any stovepiped development.

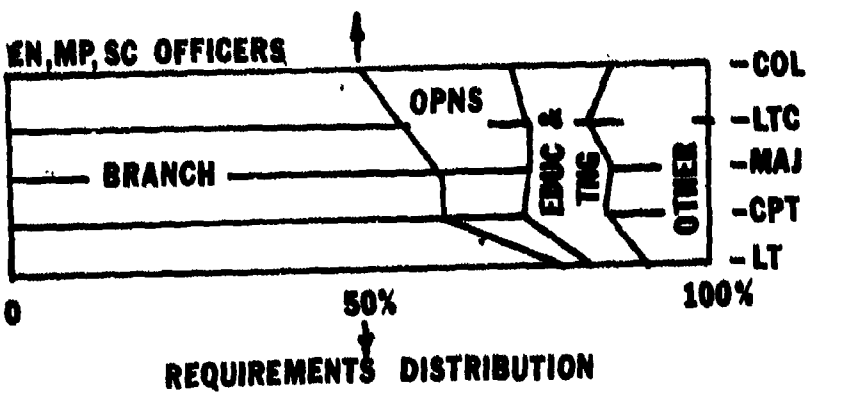


Figure 1-2

In the case of engineer specialty it was predicted in 1972 that it would not be possible to provide every engineer officer an opportunity to serve in another specialty within the operative notion of dual or multiple skill development and to simultaneously fill branch specialty requirements. Some officers would either have to be exempted from a second specialty or officers would be advised that specialty requirements precluded or limited opportunity to serve in other specialties. It was concluded that the OPMD objective should be to provide each engineer officer at least one assignment opportunity in his other specialty and that career development should work toward achieving that goal.

The first critical decision impacting the engineer career field involved identification and delineation of the number(s) of engineer specialties. The initial recommendation presented to the (then) Chief of Engineers identified three engineer specialties. Those specialties, military engineering, engineering management and topographic engineering, were each able to support a reasonable number of officers and provide a growth path for professional development.

Further analysis of this recommendation led the Chief of Engineers to conclude that the Army would be better served by an engineer population that developed engineer expertise as well as out of branch expertise. It was believed that multiple (three) engineer specialties would decrease assignment flexibility, could create an image or perceptional problem with the rest of the Army, and could work to the great disadvantage of the individual officers as selection boards attempted to assess the relative worth of and responsibilities commensurate with engineer specialty jobs outside the familiar troop arena.

One major disadvantage for a single engineer specialty was the recognition that all engineer officers could not be required to develop out of branch

specialty expertise without aggravating the shortage of engineer officers (that situation persists today). A second serious concern that surfaced during the 1972 decision briefing was that topographic engineering would suffer from lack of recognition, lack of quality officer input, and once trained an officer would be lost to the system with little or no hope of later identification and utilization. Priority, or lack thereof, was troubling to those charged with execution of the topographic support mission. There would be no career growth through O-6.

Despite these cited drawbacks, the decision was made to structure the engineer officer career development similar to other combat arms--a single in-branch specialty complemented by an out-of-branch specialty. It is important to remember that during this period the Corps of Engineers was being redesignated a combat arm. Precisely how important it was to maintain parallels to the other combat branches is impossible to deduce. Suffice it to say that this perception was a critical element in the decision process.

Since the 1972 decision, major changes have occurred in the management of officer personnel.

- Centralized selection of battalion and brigade level commanders.
- Publication of DA Pamphlet 600-3, which formalized the dual specialty concept.
- Centralized selection of officers attending command and staff courses.
- Specialty guidance into selection process for temporary (AUS) promotion to colonel based on specialty quotas.
- Reorganization of OPMD to support management by grade and specialty rather than career branch.
- Return to career branch management through O-5 in a second reorganization of OPMD.

• Specialty guidance to LTC (AUS) boards.

• Extension of command tours at brigade and battalion level to 30 months (±6).

• Promotion to LTC (AUS) by specialty (CY81).

• Specialty guidance to selection boards for Senior Service College to establish specialty representation.

This transition has been marked by revolutionary change. Personnel managers are hard pressed to provide long range career planning advice despite the increased awareness within the officer corps. It is this very fact that prompted LTG John W. Morris, present Chief of Engineers, to conclude that:

> OPMS, as presently executed, is not necessarily preparing the best engineer officers to become engineer generals. Proven troop duty does not in and of itself properly prepare an engineer officer to assure the managership of increasingly complex engineer districts. The Army needs engineer general officers who are proven troop commanders and experienced professional engineers.

National security, the raison d'etre of the armed forces, cannot be left to chance. Calculated steps are required to insure that the environment exists to mature an officer force capable of meeting the challenges presented by our adversaries. Within that broad context, the engineer officer is required to operate in combat, combat support, and combat service support functions. The engineer likewise provides support to the Army on the battlefield and in garrison and provides support to the Nation in the form of mobilization related tasks and other specialized missions uniquely suited to the Corps. In the words of the COE,"engineers are mobilized for peace and for war."

A fundamental dilemma has thereby been created by the number of requirements that compete for engineer officers. The incentive system

(promotion and selection boards) reinforces the perception that potential future district engineers and engineer general officers could not afford to miss certain gates or filters during their developmental periods. Until (or unless) steps are taken to relieve pressure exerted by such filters and until functional development concepts are exercised, the Army stands to lose at an increasing rate quality officers who otherwise would have served a total career.

THE STATUS QUO--SPECIALTY 21

To properly develop a comprehensive overview of the specialty at large, it was necessary to solicit support from action officers at MILPERCEN to establish a data base from which the problem statement could be refined and upon which analysis could be accomplished. What follows is a synthesis of that extraordinary effort.

The cross section of the engineer population shown below (Figure 1-3) highlights several key concerns bearing directly on the capability of MILPERCEN to plan and subsequently execute a feasible career growth model for engineers.

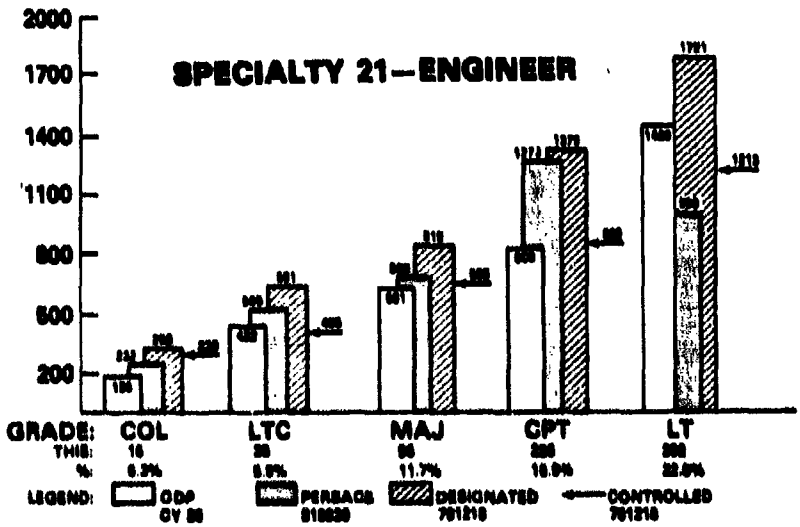


Figure 1-3

The first and most obvious concern is that there are insufficient numbers of engineer officers to insure that all requirements are adequately filled and that sufficient flexibility exists to permit personnel managers to execute OPMS in its purest sense. The critical figures to compare are those officers controlled as engineers (in other words those selected for SC21 assignment to any particular command) and the PERSACS requirement. With the exception of colonels and lieutenants, those assigned as engineers do not meet stated requirements. The ODP, therefore, represents the manner in which shortages are distributed.

A second factor, less obvious than the first, is that the existing population of engineer officers is not structured so as to maintain continuity of growth. The continuation rate (Figure 1-4) describes the ideal force required to provide the proper number of officers at the higher ranks (based on the last three years experience). It incorporates promotion points and actual losses of engineer officers to model the force structure.

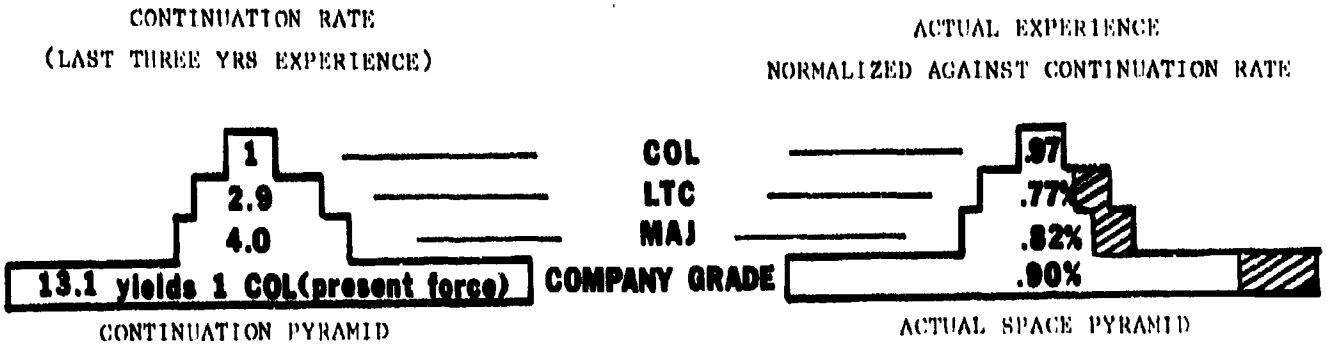


Figure 1-4

Ideally the space pyramid would mirror the continuation pyramid so that the right numbers of officers would be available for selection and advancement to positions of higher responsibility. The present situation insures that many positions are filled by officers of lesser rank and that selection boards

will be hard pressed to select the proper number of quality officers to meet the needs of the Army without some additional selection criteria.

A third and equally subtle occurrence resulting from this chronic under-alignment is the abnormally higher utilization rates for engineer officers. Under a dual specialty environment the utilization range should be between 33 and 67 percent. This operational band would insure that the OPMD objective of providing at least one tour in one's other specialty was met. The critical grades, in the judgment of the study group, are O-3 and O-4 where the officer is still in a developmental phase of professional maturity and needs to continue a broadening experience. The rates (Table 1-1) indicate that engineer officers, managed under OPMS as presently executed, spend a significant portion of their careers in branch related or specialty coded jobs.

	UTILIZATION RATE*			
SPECIALTY	COL	LTC	MAJ	CPT
21	.79	.80	.89	1.19

Nov 79 Inventory, PERSACS, 810930

Table 1-1

*The utilization rate is the ratio of those officers assigned in SC21 positions to those available for assignment.

The principal ramifications of such rates include the following:

a. Little or no exposure to another specialty;

b. Recognition by the Army that certain jobs can only be filled by engineers;

c. Inability of engineer officers to compete for the various selections in more than one specialty; and

d. Premature perception within the engineer specialty that one is "closed out" from pursuing many job assignments due to lack of training opportunities.

Current experience, given the shortage of engineer officers, indicates that the prediction in 1972 has become a reality. All engineer officers cannot serve in other specialties because the assignment pulls are too great. A review of ORB's indicates that the objective to provide at least one assignment in another specialty was not met. The results are not surprising but

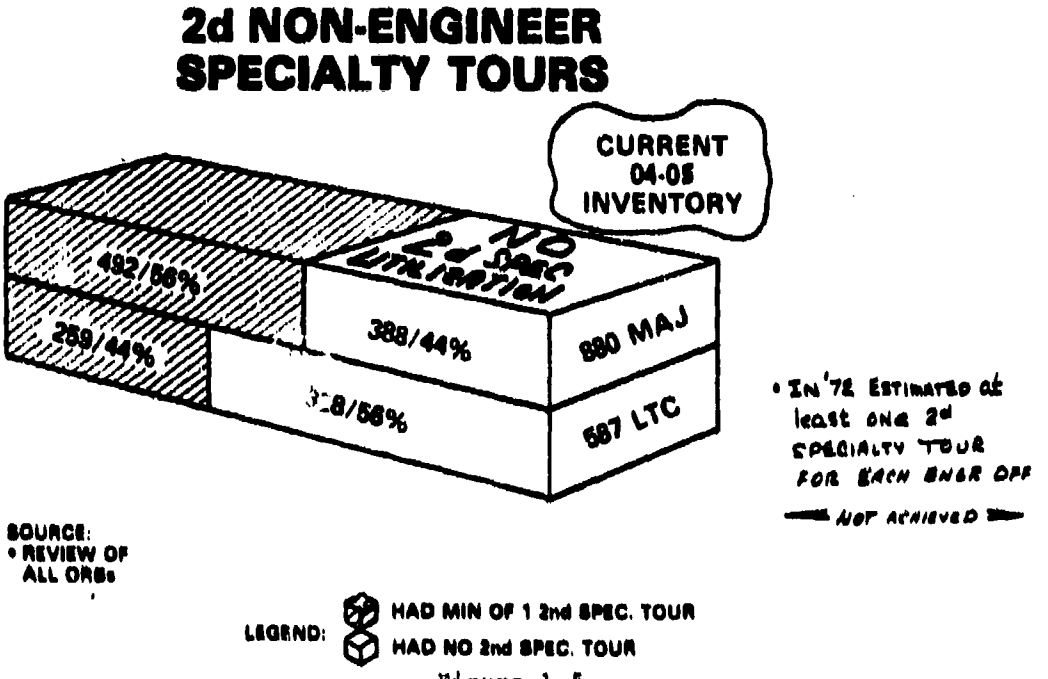


Figure 1-5

merely reinforce the fact that every engineer officer cannot be expected to serve outside SC21--the needs of the Army must remain top priority.

One ought not overreact to this situation. It simply reflects one cost of doing business. There are some jobs that can only be done by engineer officers. So long as both the development concept and the incentive and reward systems recognize that basic fact, the Army, the specialty and the individual are better served.

Any developmental model must reflect the requirements for talent at various grade levels. Figure 1-6 profiles the engineer positions presently included on the PERSACS.

The bulk of the developmental positions appear in troop assignments whereas the bulk of the senior utilization assignments are in the construction management type assignments.

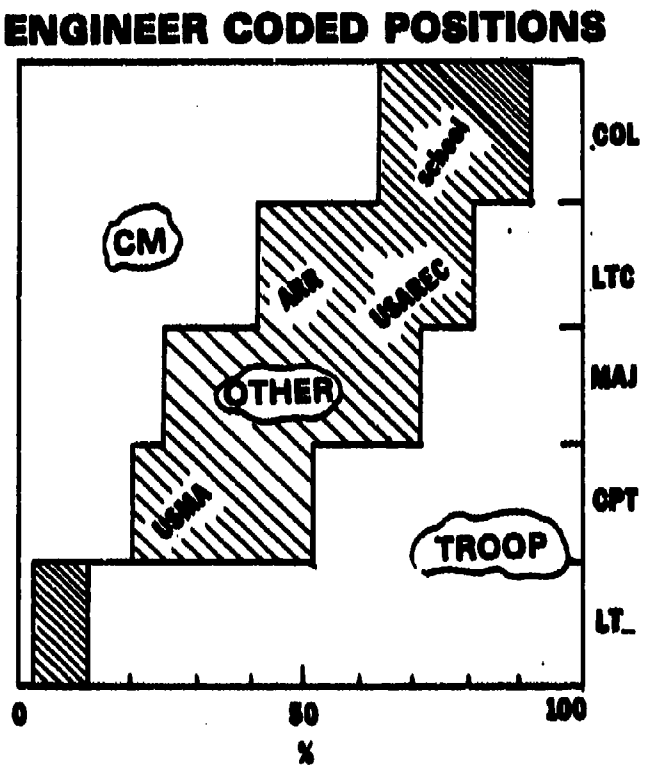


Figure 1-6

Recognize this actual workload is the antithesis of the situation for which OPMS was designed. The center band represents positions for engineers not classically troop or construction management. Recalling the utilization rates, fill of all engineer coded position shown in Figure 1-6 requires greater than 85% of the engineer officer population and therefore suggests a need to modify the management concept.

The population which is available to meet the above cited requirements has undergone some subtle changes. The specialty consists of approximately 2/3 "hard skill" engineer officers, 1/6 "related" skills and 1/6 "soft" skills distributed as below:

ENGINEER SKILL DISTRIBUTION BY ACADEMIC DISCIPLINE

	Hard Skill	Related Skill	Soft Skill
Typical Academic Disciplines	• Civil Engineer • General Engineer • USMA • Architecture	• Mathematics • Aerospace Engineer • Chemical Engineer • Geodetic Science	• Education • Arts • Literature • Physical Education
COL (256)	213	25	18 (7%)*
LTC (591)	486	67	38 (6%)
MAJ (819)	565	174	80 (10%)
CDT (1379)	912	254	213 (15%)
LT (1721)	1042	228	451 (26%)

*% soft skill within each grade

Table 1-2

The increasing number of soft skill engineers within the engineer population distribution highlights the difficulties experienced recently within ROTC detachments. Industry has become increasingly more attractive to graduate engineers (recall that a premise of the all volunteer force was to remain economically competitive in the marketplace), most college curricula no longer require mathematics for BA students, and the decline in aerospace industry has resulted in a shift of potential students to other disciplines. This trend is further exacerbated as increasing numbers of USMA graduates appear to be opting for the softer disciplines in the curriculum at West Point.

At this juncture it is difficult to determine whether this profile of academic skills represents a long term steady state condition or whether it is a recent phenomena. One trend, however, is surfacing: a greater

percentage of soft skill engineers are remaining on active duty while the hard skill engineers are leaving the Army for reasons yet undetermined (MILPERCEN and DCSPER have not logged this data).

OFFICER LOSSES
ENGR vs ARMY

TOTAL	'77	YEAR '78	'79	REMARKS
EN % LOSS / ARMY % LOSS	10% / 9%	11% / 9%	12% / 9%	> ARMY AND GOING UP / CONSTANT
SUBSETS				
RA RETIREMENTS EN vs ARMY	SAME	EN 2.6% GREATER LOSS	EN 3.6% GREATER LOSS	TREND--GOING UP
RA RESIGNATIONS % EN ELIG TO RES. THAT DID / % ARMY ELIG TO RES. THAT DID	5.5% / 4.2%	5.7% / 4.2%	?	> ARMY AND GOING UP / CONSTANT
OTRA RETENTION EN % LOSS / ARMY % LOSS	NO DATA	66.5% / 34.0%	68.2% / 31.0%	LOSE > ½ / LOSE < ½

Table 1-3

The retention picture is not good. In an already critically underaligned specialty, heavy loss rates coupled with an increasing population of soft skill engineers will place severe constraints on the personnel management system in the 1980's. Although no specific data is available, sensings gathered during field interviews and through informal questionnaires at large gatherings of engineers indicate the following distractors seem to be operative:

- loss of job satisfaction.
- increased marketability in the private sector.
- increased sensitivity to the needs of one's family.
- widespread dissatisfaction with the professional development management systems as presently executed.

• extremely high frustration levels generated by perceived inability to influence the assignment process to maximize one's strengths.

• uneasy perception of ever increasing, tighter gates or hurdles for advancement.

Whatever fine tuning is contemplated for OPMS, it is apparent that we must involve the individual officer in career directional decisions early and thereafter periodically review professional goals and objectives. In this or any other similar approach, a mutual commitment is made by the officer and the personnel manager to meet the needs of the Army. Presently the personnel manager must attempt to meet the needs of the Army without a clear understanding of the personal and professional goals of the engineer officer.

Shifting our attention to the incentive and reward system yielded some interesting results. Using the product of the 1979 and 1980 O-5 and O-6 command selection boards produced the following identifiable, shared characteristics (among engineer officers).

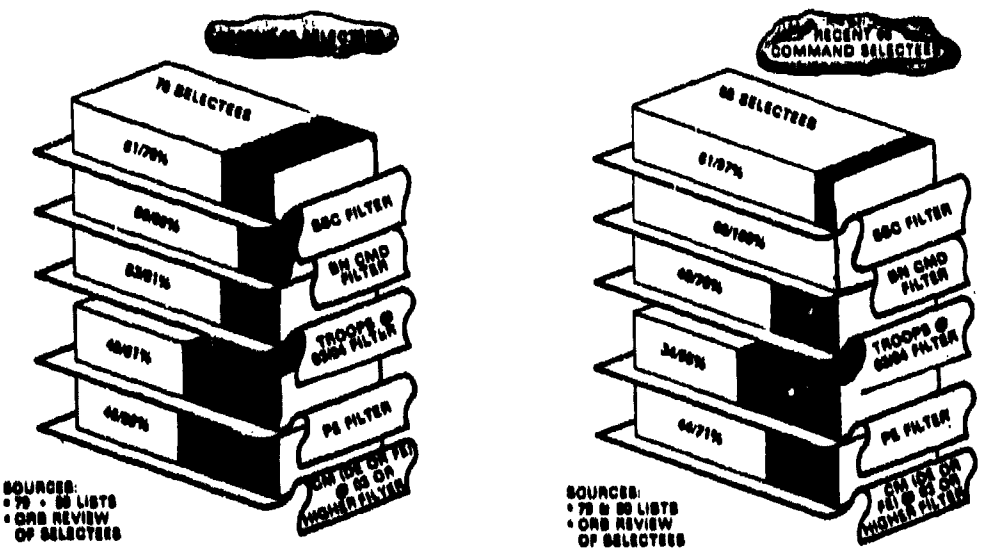


Figure 1-7

Of critical note is the absolute requirement for battalion command and the nearly absolute requirement for SSC to be selected for 0-6 command. Equally telling in both cases is the predominant duty with troop units at the senior captain or major level. With the exception of CGSC, which likewise is an absolute filter, no assignment patterns or job experience correlated to any significant degree, including service on DA or other high level staffs (60%). The message is clear--the officer who concentrates on mastering the troop leadership skills is the officer who advances.

No one will argue that troop duty should not be top priority for development to insure that engineers are prepared to fight, support and win the first battle. The question is whether an absolute filter prevents some totally capable, fully qualified officer who has developed depth of experience in a field other than troop command from selection to command an engineer district. The graphs below provide some insight into that proposition.

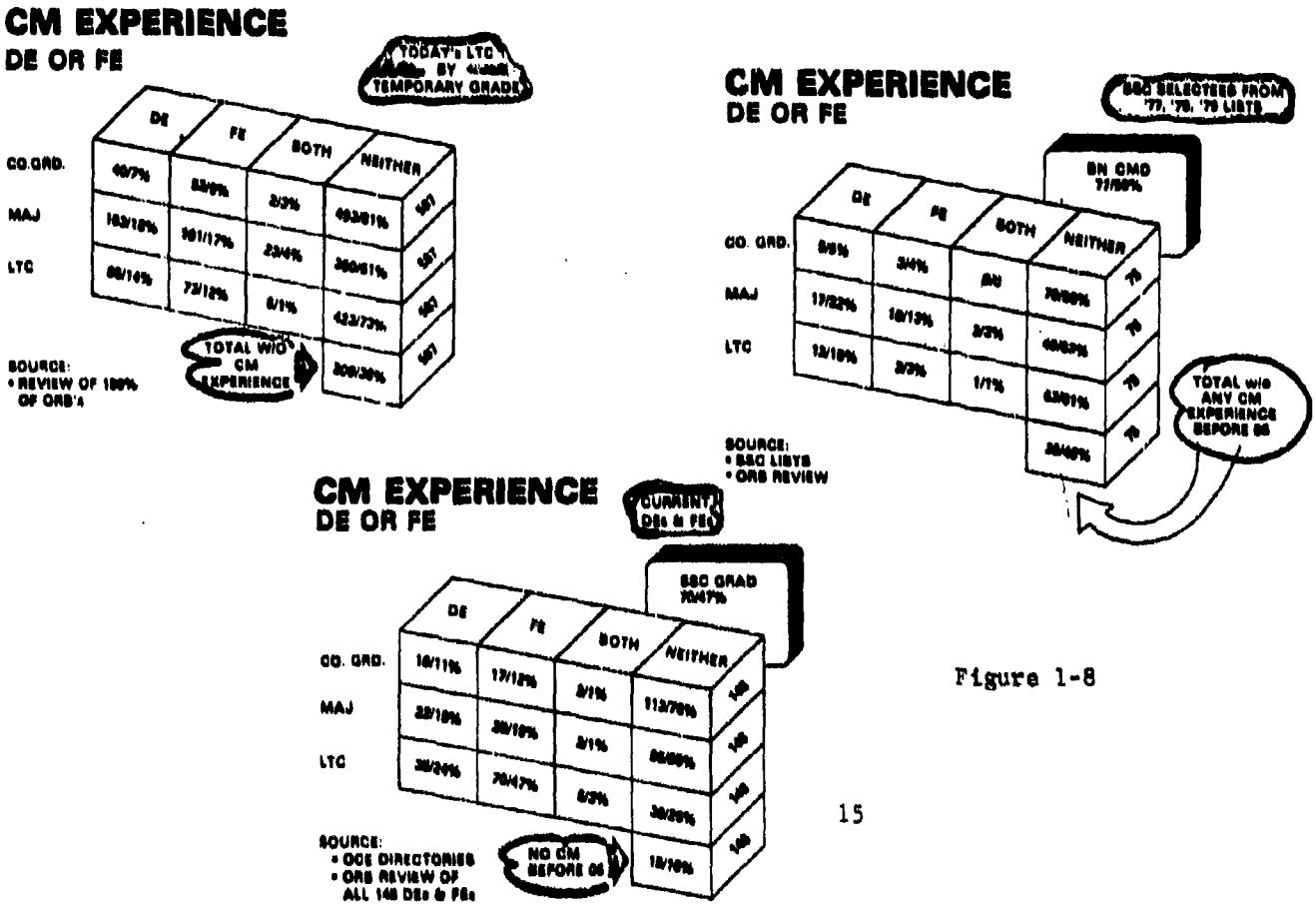


Figure 1-8

Note that 99 percent of the SSC selectees from the past three years have been battalion commanders and 46 percent of them have never served in either an engineer district or in a facilities engineer organization. Conversely, of the present district or facilities engineers, only 47 percent are SSC graduates and only 10 percent had no prior district or facilities experience. One might deduce assignment patterns and success rates (as measured by promotion potential) from those factors. This subject is addressed later in the report.

PROFESSIONAL DEVELOPMENT CHALLENGE FOR THE 1980's

As the Army moves into the 1980's several key factors impact on the flexibility of the personnel management system to develop the right numbers of engineers in the right grades with the proper skills to meet the needs of the Army. Among the more crucial factors are the following:

- Current average tour lengths: 32 mo(CONUS); 36 mo(long tour O/S)
- 30-month command tours for O-5 and O-6 commanders.
- promotion to O-5 and O-6 by specialty.
- selection to SSC by specialty.

DOPMA, if legislated as presently proposed, establishes the leading edge of the O-6 promotion window at 21 years of service. Research by the study group and the MILPERCEN action officers indicates that an average of 5½ years is required for all engineer officers to become well grounded in the specialty. This initial developmental phase, to include successful command of an engineer company, is critical to the viability of the specialty because it insures that every engineer experiences the role of the engineer as a member of the combined arms team. The challenge then is the optimum manner(s) to develop a corps of officers in the time remaining to meet the needs of the Army.

Question: Is there too much to do between designation of another specialty and attendance at SSC?

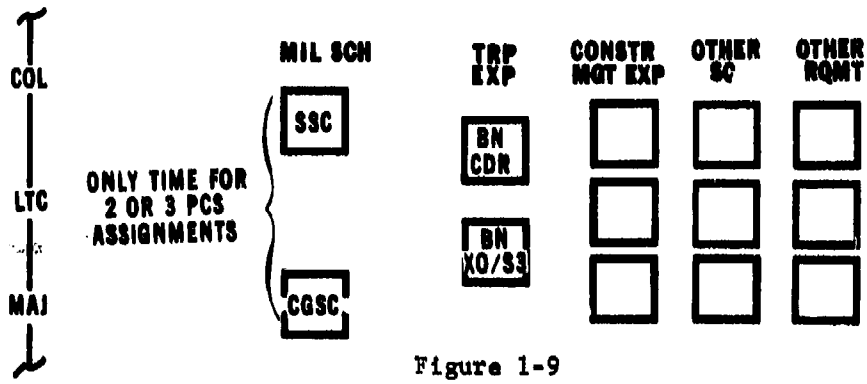


Figure 1-9

Question: Does OPMS, as presently executed, dilute expertise across the board and penalize the officer who is assigned in such a manner that he develops depth of experience in a functional area?

Question: Is there a method to improve the developmental process within PCS constraints?

Question: What, if anything, can be left out?

These are some of the key questions that will be addressed in later parts of this report.

CRITICAL PARAMETERS

The primary focus of this study effort is to develop the right number of engineer officers in the proper grades with the requisite skills to meet the needs of the Army. At no time is the primary notion to design an optimum system simply to get officers promoted. Selection for promotion is a by-product of demonstrated performance and potential while satisfying the needs of the Army. The good of the Army must be served first.

A second, but equally important parameter, is that a professional development model must work to bring the specialty closer to the Army. Recognizing the requirements generated by the civil works function, steps are necessary to alleviate the perception that SC21 is separate from the mainstream of the Army. Throughout this analysis the study group attempted to analyze the situation from the Army's perspective as well as that of the engineer specialty.

THE TASK SPECTRUM

Prior to any assessment of how effectively the personnel system is providing engineer officers trained to accomplish various tasks, it is necessary to determine just what engineer officers must be trained to do. The spectrum of engineer tasks is divided into four categories. These four categories provide a basis upon which assignments and career plans can be plotted.

Category I is that support to the Army provided by the SC21 by furnishing engineer officers to serve the general Army activities such as ...

- Training,
- Recruiting,
- Developing tactics and doctrine,
- Research and development, and
- Staff assignments.

Category II is that support to the Army on the battlefield furnished by SC21 by providing engineer units. This involves ...

- Training engineers,
- Developing engineer requirements for material,
- Manning engineer units and staffs,
- Developing engineer doctrine, and
- Developing the rationale for an adequate engineer force structure including reserve components.

Category III is that support to the Army provided by SC21 in garrison through ...

- Facility engineering and
- Planning and programming of facilities for the Army.

Category IV is that support to the Army and the nation provided by SC21 through special engineering tasks ...

- Civil works and military construction,
- Engineering support and services to other (friendly) nations,
- Mobilization and emergency planning,
- Topography, and
- Engineer laboratories and research and development.

CHAPTER II

FUNCTIONAL AREA ASSESSMENT

Chapter I of this study described the current status of the US Army Corps of Engineers officer development. It is a snapshot of the force in the field after seven years of OPMS operation. This portion of the study provides an analysis of each of the Corps of Engineers support functional areas in isolation of the other functions. Engineer support on the battlefield, as an example, is one major function. Career development objectives are structured to develop an officer with a background optimized for this function. Similarly, career development objectives are outlined that will optimize an officer's background for performance in the function of engineer support for the Army in garrison, and for special engineering support including topography.

This process was designed to force conflict resolution. Each area is presented as an entity in and of itself with professional development objectives cited to support that field of expertise. Tradeoffs in terms of breadth versus depth of experience, specialization versus generalization, flexibility and use to the Army will be incorporated into recommendations for fine tuning the present professional growth model, in chapters III and IV.

ENGINEER SUPPORT ON THE BATTLEFIELD

Task

The task is to assess the effectiveness of OPMS in supporting the Army on the battlefield.

Analysis and Current Status

General.

Engineer officers, in troop units are capable of supporting the peacetime Army in the field and are currently capable of providing adequate combat engineer support on the battlefield when called upon. Much of the success of engineer support on the battlefield emanates from the can-do attitude and traditional enthusiasm displayed by engineer officers while overcoming the obstacles associated with inadequate doctrine, obsolete equipment and serious shortages of engineer captains and field grade officers.

An understanding and confidence in the personnel management system which governs the officer corps is affecting the ability of engineers to provide battlefield support. A sensing surfaced indicating a general lack of understanding and confidence in the OPMS throughout the engineer officer corps in both company and field grade officers. This feeling is manifested in the following areas:

- strong perception of "excessive sidetracking" into other assignments which have no relation to the officers' personal interests, strengths or desires to serve with troops, and,

- a growing frustration with their inability to develop a long range, logical progression of assignments that includes periodic reassignment to troop units;

- conflicting career guidance received from a multitude of sources (MILPERCEN, commanders in the field, etc.) and the apparent inconsistencies with promotion or selection board results;

••MILPERCEN assignment officers perceived as being guided solely by requirements and quotas with little flexibility or concern for individual officers' preferences; and

••no single vocal proponent for engineer support on the battlefield. While these perceptions may or may not be true, a large number of junior field grade officers believe that the perceptions are true. These officers are frustrated by the difficulty they experience in getting to where the action is (troop assignments), while being forced into meeting alternate specialty requirements.

Assignment Priorities.

The Chief of Engineers has repeatedly stated that troop duty is "priority number one." Although he fully supports troop duty as the first prerequisite for qualification as an engineer officer, assignment priorities for troop units remain relatively low. Fill of majors to troop units range from 80 percent to 86 percent while captain assignments to troop units range from 53 percent to 57 percent of ODP authorized strength.

The Officer Distribution Plan (ODP), which reflects the Department of the Army Master Priority List (DAMPL), does not recognize the importance of troop assignments. Shortages are distributed to the field commands. For example, when comparing the CY 1980 ODP against authorizations, the five major field commands are short significant numbers of captains through colonels as shown in Table 2-1.

The DA Staff, various Joint Activities, Senior ROTC Instructor Groups, Recruiting Command, and OCE-Civil Works, as designated activities, are supported at 100 percent of authorization by grade. Not only are these activities supported at 100 percent of authorization by grade but they also include only officers whose demonstrated manner of performance falls within the upper and

SC21 OFFICER SHORTAGE AS PERCENT OF AUTHORIZED

	GRADE			
COMMAND	0-6	0-5	0-4	0-3
USAREUR	20	17	14	43
EUSA	33	18	16	42
WESTCOM	0	29	27	48
FORSCOM	28	22	18	47
TRADOC	36	27	27	39
DA STAFF	0	0	0	0
OCE-CW	0	0	0	0
USMA	0	0	0	0

Table 2-1

middle third of the officer corps. Consequently, lower third officers (captains through lieutenant colonels) are generally distributed to the major field commands rather than equitably throughout the entire Army. Given that the field commands provide officers for troop units and are also responsible for manning the service schools (TRADOC) which train engineer officers and soldiers and develop doctrine, assignment priorities do not optimize support to the Army in the field.

Training Engineer Officers.

The Engineer School (USAES) at Fort Belvoir has the responsibility for developing engineer doctrine and for training engineer company grade officers in combat and construction engineering. USAES conducts a portion of the precommand course for engineer battalion and brigade commanders. USAES has maintained a reputation among engineer officers in the field for less than dynamic

leadership in most facets of engineer support to the battlefield. There is the perception by many field grade officers that "Belvoir" does not have a strong image and that the Engineer School is not adequately staffed to be a credible leader in the engineer community or in the Army. Assignment priorities reinforce this perception. As an example, of the 12 majors assigned to the Staff of Fort Belvoir who fall in the primary zone for promotion to lieutenant colonel (AUS) in FY 1980, ten have been previously non-selected for promotion to lieutenant colonel (AUS). There is no intent to in any way impugn these officers or their performance, but only to reinforce the assignment priority afforded Fort Belvoir.

Many of the Engineer officers trained at Fort Belvoir will serve in troop units in USAREUR or in Reforger units scheduled to reinforce Europe. However, the USAES has no priority for ex-battalion commanders who have commanded in Europe. It is essential that the Engineer School have officers with the requisite experience in combat engineer operations in USAREUR if the USAES is to have credibility within the Corps and the Army. Assignment priorities to the USAES are inadequate to support the Army on the battlefield.

Another important aspect of training SC21 officers to support the Army on the battlefield is the experience they obtain in troop units. The ideal preparation for battalion command is to serve in a variety of positions at different levels within the battalion. These assignments provide the depth of experience and expertise needed by a battalion commander to confidently and imaginatively command his unit. It just stands to reason that the lieutenant colonel who has successfully commanded a company and served satisfactorily as a battalion operations and executive officer at the

appropriate grade is better qualified for battalion command then an officer who has not served with troops as a senior captain or major.

Structure.

Only approximately 30 percent of the engineer structure is in the active force. This, coupled with the fact that the Army is critically short engineer officers, has created a dangerous situation when considering assignment priorities to troop units. Troop units are forced to absorb a disproportionate share of the engineer officer shortage.

Assignment Realities.

There is universal agreement that all engineer officers should start out as platoon leaders and successfully command engineer companies in order to gain specialty qualification and to understand the engineer role on the battlefield. From this point on there is considerable disagreement. Many senior field grade and engineer general officers do not consider a troop assignment as a senior captain or major a necessary prerequisite for battalion command. They consider it more important for a senior captain or major to get a training tour with an Engineer District or Facility Engineer activity than to serve with troops at that level. The logic of this career development advice is often contrary to the advice given by assignment and personnel management officers at MILPERCEN who are driven to some extent by the type of data shown in Figure 2-2, which emphasizes the importance of troop experience to promotion and selection boards. There is strong evidence that engineer officers understand this "gate." They believe that an engineer

who does not serve successfully in a troop unit as a senior captain or major jeopardizes his chances for selection to command as a lieutenant colonel.

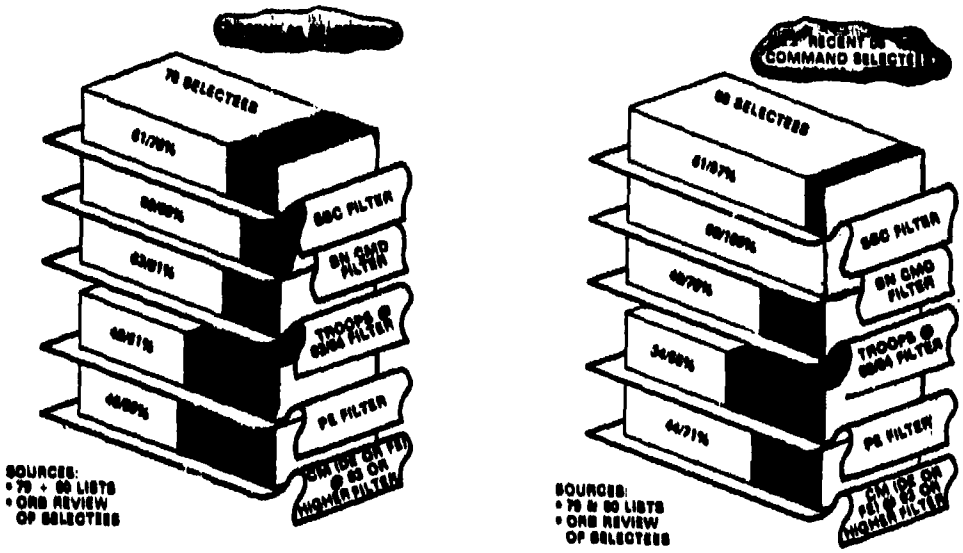


Figure 2-2

Conclusions (Support on the Battlefield)

a. There is significant dissatisfaction with OPMS. This dissatisfaction is caused primarily by the shortage of SC21 officers at the captain and major level. The Corps of Engineers has not in the past accessed and retained adequate numbers of engineer officers to satisfy requirements. There is strong officer dissatisfaction over their inability to influence their own career development.

b. Specialty Code 21 officers are doing an adequate job of providing combat engineer support to the Army in the field in spite of significant shortages of captains and majors. The large number of designated activities which are filled to 100 percent of authorized grade with upper and middle third officers results in troop units and service schools bearing a disproportionate share of the officer shortage.

c. Many senior engineer officers consider that troop experience at the 0-4 level is not necessary for successful battalion command. DA Command Selection Boards, however, continue to select based on the parameters they consider to be best for the Army, e.g., recent troop experience. The conclusion of this study is that support on the battlefield is enhanced my duty with engineer troops at the senior 0-3 or 0-4 level.

d. Engineer officers receive conflicting career guidance from a variety of sources, which in many instances, has little correlation with assignment realities and selection board results.

e. Fort Belvoir is not a credible leader in the engineer community or in the Army.

f. There are too many "pulls" on an engineer officer resulting in significant frustration, disillusionment, confusion and a retention rate that is worse than the Army average.

Professional Development Objectives (Battlefield Support)

a. Access and designate adequate numbers of SC21 officers to meet the Army's needs.

b. Insure a utilization rate for SC21 officers that allows for cross-fertilization within the Army.

c. Adjust the DAMPL and ODP in order that the quality and number of SC21 assets are distributed equitably throughout the Army.

d. Provide troop experience to include successful company command.

e. Training and doctrine personnel must have been successful practioners.

f. Battalion commanders should have had troop experience as a senior captain or major.

g. Designate non-accession SC21 officers at six years of service for early introduction into the engineer environment.

ENGINEER SUPPORT IN GARRISON

Task

The task is to assess the effectiveness of OPMS in supporting the Army in garrison throughout the world. In order to obtain a more detailed view of the future of the facility engineer the concept of turning away from the professional civilian force toward maintenance by contract is examined.

Analysis and Current Status

General.

In the opinion of most installation commanders, facility engineers are providing the best support possible in view of current limitations. The general perception throughout the Army is that the quality of the officers assigned to the facility engineer has been improved somewhat by the recent high level of interest of the Chief of Engineers and by the significantly improved stability of assignments. Unfortunately these improvements have been offset or eroded by civilian personnel reductions both in numbers and the concomitant reduction in grades and a continuing minimum level of Washington executive concern. These functions are often passed to the engineer troop units and special duty personnel. These problems are likely to be exacerbated by the move toward Commercial-Industrial Type Activities (CITA) which results in further reductions in quantity and quality of personnel in the facility engineer office. The general perception among engineer officers is that an assignment with the facility engineer is undesirable even though it can provide an engineer officer at any level with valuable experience in contract management, construction management, and personnel management.

Avoidance of FE assignments by engineer officers creates a dicotomy for the Army. In an era of shrinking resources, management of the Army's physical plant becomes increasingly important. The Army is compelled to cause the rewards of FE assignments to be commensurate with the difficulty of the task.

Not to be overlooked are the benefits derived from the FE contacts with a large and varied segment of officers from other branches of the Army. Unfortunately the opportunity for junior officers to serve in the facility engineering offices appears to be eroding. The number of these officer spaces has continuously decreased over the past decade. The assignment opportunities have been further eroded by a lack of officers to fill many of the slots that do exist. There are varying perceptions among captains and majors regarding the opportunities and job satisfaction involved in facility engineering. This is brought about by assignment policies in the past that assigned only those officers who were noncompetitive in the command arena as the facilities engineer. Several officers suggested a change in the acronym DFAE which suggests the name of a cartoon character rather than that of a professional engineer organization.

Master Planning.

There is a general perception among both engineers and installation commanders that there is not enough customer involvement in the master planning process. Within both engineer and commander functions is too much short range planning and not enough long range thinking input to the master planning process. Part of the problem stems from the fact that an indivdual doing the master planning will not be in the same position by the time the facilities are budgeted and constructed some five to eight years later.

The master planning function may be taken over by a contractor under the CITA concept. This will result in a further degradation of skills and grades within the facility engineer organization.

USAREUR Installations.

The maintenance, operation and development of installations in USAREUR is a particular problem. Each DEH in USAREUR must deal with non-English speaking employees and marginal performance contractors. Generally the DEH organization is only one man deep in each key position. USAREUR has numerous procurement exceptions not found in other theaters. OPMS does not develop trained individuals for the Director of Engineering and Housing (DEH). Yet in the view of many senior engineers, it is within the DEH that the need for engineering expertise and leadership is greatest.

Civilian Personnel.

The civilian personnel force at most installations is suffering an ominous decline. The strength of the civilian force is now insufficient to handle the demands of the job being undertaken. With this reduction in force levels comes the accompanying reduction in the grades of the supervisory staff. This grade reduction naturally results in a decline in the experience level of key individuals. Thus the civilian staff at many posts has grown too thin to provide any overlap within the office and any true depth of experience among the professional staff. The result at best is patchy performance.

Conclusions (Support in Garrison)

a. The foregoing discussion suggests that the experience opportunities for engineer officers within the Facility Engineer offices are not being maximized because of the reluctance of quality officers to seek assignments there.

b. Increase the number of slots that must be filled in the DFE area at the captain and major level in order to provide transferable experience to be able to better support the Army in the years to come with experienced contract construction managers.

c. It is desirable to better educate the Army community on the requirements for master planning.

d. Consideration should be given to selection of O-5 and O-6 officers to key FE and DEH positions by engineer selection board. Improved credibility would provide additional incentive for individuals to try to obtain experience in these jobs at the O-3 or O-4 level.

e. Increase the assignment opportunities for junior engineer officers in the DFAE type organizations in order to gain contract and contruction experience that could be applied to later assignments.

Professional Development Objectives (Supporting the Army in Garrison)

a. Access sufficient numbers of SC21 officers to allow each officer to obtain sufficient training particularly in the fields of construction and contract management, thus providing him with the background to adequately support the Army in Garrison.

b. Adjust the DAMPL and ODP to increase the probability for assignment in the DFAE organizations.

c. Enhance the image of all of the jobs within the DFAE field in much the same way as the current DFAE positions have been upgraded.

d. An officer's first tour should be with troops and should include a successful company command tour.

e. An officer should be assigned to an DFAE organization while a company grade officer.

f. An officer should be assigned as a DEH or DFAE as a junior field grade officer.

g. Utilization tour should include duties as DEH or DFAE and engineer staff officer at MACOM or higher level.

ENGINEER SUPPORT TO THE NATION

General

Engineer support to the Nation is one of the major functions of the Corps of Engineers. Considered in this function are:

a. Civil works new construction, operation and maintenance, to include:

(1) Flood control,

(2) Water resource development, and

(3) Navigation;

b. Civil Works regulatory program, to include:

(1) Section 9 and 10, Rivers and Harbor Act of 1899,

(2) Section 404, Federal Water Pollution Control Act Amendments of 1972, and

(3) Section 101, Ocean Dumping Act;

c. Real Estate acquisition and disposal;

d. Engineer research and development;

e. Emergency relief actions; and

f. Mobilization support.

The subject of this study arises from the perception of the Chief of Engineers that Corps officers are inadequately trained in the field of construction management to perform this function adequately. The risk inherent in the assignment of less than fully trained district engineers and facilities engineers is considered by the Chief of Engineers as unacceptable. It should be noted that only 10 percent of the current district and facilities engineers have no construction management experience but statistics show that in the future a greater number of highly competitive officers will not have CM experience. Examination of the FY 78 and 79 06 selection results, shows 29% of the officers on the command list, 41% of the officers on the 06 promotion list, and 46% of the officers on the senior service college list do not have CM experience. Although 36 percent of all current lieutenant colonels have construction management experience, the population that will satisfy the battalion command and SSC filter in the future will have considerably less CM experience if current system remains in force.

Support to the Nation, Officer Training

Task

The task is to access the effectiveness in training the Corps of Engineers officer to fulfill his role in supporting the Nation.

Analysis and Current Status

a. Assumption. The role of the Corps officer in supporting the Nation is assumed to be primarily in the civil works as opposed to the other functions of supporting the Army. In the business of civil works, an expertise in construction management is explicitly required at least to some extent.

b. Perceptions of District Employees. District employees interviewed during the study preferred, almost unanimously, that the DE not involve himself in the day to day engineering operations of the district. He has expert engineer advisors. It is essential that he involve himself in the political aspects of the district (interface with the external environment) and with

the financial, personnel, and procurement management functions of the district. He will, however, be required to make a few very major engineering decisions that may result in litigation. Therefore, sound judgement and broad management ability are qualities necessary for day to day district engineer operations. Engineering qualification is necessary to substantiate those few major engineering decisions that must be made and to give the district engineer credibility internally and externally.

c. Perceptions of General Officers. The majority of the general officers interviewed felt that the selection process was so discriminating that only the best Corps officers were selected to be district engineers. Thus their native capability and experience permit them to perform the district engineer functions well. Because of the major engineering decisions that a district engineer might be called upon to make, they feel that the officer should attempt to become a registered professional engineer. This is desirable for credibility purposes, not for day to day functioning. They feel that it would be extremely useful for young officers to be assigned for a "training tour" in a district or facilities engineer organization even if that tour were substituted for the engineer officer basic or advanced course. This tour would provide an invaluable opportunity to develop a nucleus of officers capable of executing mobilization or other major construction tasks. A major source of concern is that no one is effectively managing an individual's career. Engineer careers should be monitored by engineers. The major problem with the Corps officer structure is strength--accessions and losses. No general officer interviewed believes that the engineer specialty should be split into a construction-sapper specialty. A non-engineer specialty

is essential to provide engineer officers through out the Army. As an objective, a division engineer should have served as a district engineer.

d. Perceptions of Senior Field Grade Officers. Perceptions in this group were pretty much in agreement with the general officer perceptions. The greatest difference in perceptions was the value of the experience gained at the O-2 to O-3 level in a district versus the experience gained as a deputy district engineer, O-5. This group, as opposed to the general officers considers that the experience gained at the O-2 to O-3 level is of little value. A great deal of value is gained if the experience is at the O-5 level. This group believes that battalion command is a valid prerequisite for district command. They also feel that FE experience is transferable to district activities.

e. Perceptions of Junior Field Grade Officers. The O-4 SC21 population at the CGSC was interviewed. Interestingly, the group seemed to be divided about equally regarding preference of future career assignment to mainstream Army and to civil works. Their chief complaint focuses about the lack of career development model and their perception that there is no manager of the SC21 career field. They favor carefully paired specialty codes with SC21, such that skills are transferable between their specialities.

f. Construction Management and OPMS. At face value, assignment priorities do not enhance the training of officers in Construction Management. The deficiency is easy to explain. Central selection boards do not identify with Corps construction management jobs. Advancement to command is based on performance with troops. Selection for engineer division command is based on a

successful district command. District command depends upon SSC completion (97%) and (100%) successful battalion command. Battalion command depends in large part upon a troop assignment at the O-4 level (70%). See figure 1-7. With today's alternate specialty requirements, stabilized tour policies, and Corps of Engineer assignment priorities, there is little time for a construction management assignment during the course of a "SUCCESSFUL" career.

g. Professional Engineer Registration Considerations. Although not directly related to OPMS, the Professional Engineer (PE) registration is considered here. In order to adequately man the engineer force, nonengineers must be accessed to the Corps. Of the current population of lieutenants, 26 percent are non-engineers. The population decreases to 7 percent of the current colonels. It must be remembered, however, that the current population of O-4 and above were accessed during the era of a draft. It seems reasonable that the ratio of "soft disciplined" Corps officers to engineers will increase since the job market is more attractive for the trained engineer.

It is generally accepted that a PE license for a DE or any engineer officer is highly desirable. The PE does not necessarily relate to his day to day functions but rather to those rare critical decisions of an engineering nature that he must approve. The PE adds to the DE's credibility in dealing with employees and contractors and is critical in litigation with respect to DE decisions. Therefore, effort is necessary in order to make the nonengineer population eligible to acquire the PE license or direct them towards assignments commensurate with their background (see the expanded discussion in a later section.)

Conclusions (Support to the Nation)

a. Officers generally perform well as district engineers even with a lack of construction management experience because the selection process is so discriminating that only superior individuals are selected. Prior experience, however, enhances competence and increases the probabilities for sound executive level contribution while decreasing learning time required.

b. Individuals may have a secondary, non-engineer specialty but care should be exercised in its selection to insure that skills are mutually reinforcing.

c. Attempts should be made to have a training tour in a district or an FE organization for junior officers.

d. An engineer organization must monitor engineer officer careers.

e. Programs should be instituted to assist "soft-disciplined" officers to acquire engineer skills. PE registration should continue to be encouraged.

Professional Development Objectives (Support to the Nation)

a. Junior officers must have troop experience to include successful company command.

b. Junior officers (O-2/O-3) should have a facilities engineer training tour.

c. Officers should have a tour with an engineer district at the O-4/O-5 level.

d. The district engineer should have an MS degree in an engineering discipline, be a graduate of CGSC and SSC, and have a PE license.

ARMY TOPOGRAPHY

Task

The task is to assess the effectiveness of OPMS in supporting the requirements of the Army Topography function. The analysis incorporates a discussion of the purpose of OPMS as it relates to Army Topography, the structure which determines officer requirements, the current status, or health, of the function measured against the objectives of OPMS, and an attempt to examine its future direction.

Analysis and Current Status

General.

OPMS was created, in part, to better accommodate personnel requirements in specialized areas. Specialized areas had become increasingly complex, and assignment of the senior level (O-5/O-6) generalist produced by the personnel management system often resulted in less than professional performance and less than personal satisfaction of the officer concerned. The OPMS concept provided for narrowed specialty area emphasis, formal training, education, and experience at multiple levels. Army topography today has evolved with all of the characteristics of a very specialized area.

Officer Requirements Structure.

The Defense Mapping Agency (DMA) is charged with providing support to the Secretary of Defense, the Military Departments, the Joint Chiefs of Staff, and other Department of Defense (DOD) components as appropriate, in matters concerning mapping, charting and geodesy and military geographic information and documentation.

Army officer requirements to staff this function are predominately all SC21 (Engineer) and are coded 21D (Engineer Topography) in the Personnel Structure and Composition System (PERSACS). Table 2-2 summarizes all PERSACS 21D positions in the Army structure.

ARMY TOPOGRAPHIC OFFICER SPACES

Grade	Topographic Officer Requirements (Spaces)
0-6	9*
0-5	25
0-4	24
0-3	36
0-1/0-2	16
	Total 110

*Three positions are rotational.

Table 2-2

Examination of the SC21 continuation rate derived from data from the past three years, shows the number of SC21 0-5's necessary to satisfy 0-6 requirements, the number of 0-4's necessary to satisfy 0-5 requirements, and so on. Results are shown in table 2-3.

SC21 CONTINUATION RATE

Grade	SC21 Continuation	Rounded Rate
0-6	1	1
0-5	2.95	3
0-4	4.03	4
Co. Grade	13.14	13

Table 2-3

Ideally, the spaces pyramid should look like the faces (continuation) pyramid. Table 2-4 shows the number of 21D spaces required by the continuation pyramid and compares that "ideal" to the existing space structure from Table 2-2.

IDEAL 21D SPACE STRUCTURE

Grade	Continuation Rate	21D Spaces (Actual)	21D Spaces (Ideal)
O-6	1	9 (given)	9 (given)
O-5	3	25	27
O-4	4	24	36
Co. Grade	13	52	117

Table 2-4

Table 2-4 illustrates the fact that there are insufficient spaces available at the lower grade levels (Company Grade, Major), considering the average SC21 continuation rate, to provide a sufficient number of trained and experienced senior officers. Additionally, this type analysis assumes an extremely efficient officer management system--inefficiencies in the identification, training, education, and assignment process will compound the effects of the space availability problem. Adequate numbers of potential junior officer topographic spaces exist within the civilian structure of DMA.

Topography as a Career Field.

Certain elements of the officer management system which staffs the topographic structure of the Army can be addressed objectively. Unfortunately, other elements are intangible and assessment is the subjective interpretation of perceptions which may or may not be pervasive, resulting in conclusions which are subject to questions of validity. Much of the succeeding discussion results from the latter.

Although strong individual voices were encountered during the study which argued to the contrary, a consensus of perceptions was sensed which suggests:

a. Management of officers to staff topographic positions (identification, training, education, career development) is done poorly or not at all.

(1) system is reactive and does not consider officer preferences;

(2) requirements are filled with officers available for reassignment almost regardless of background; and

(3) "topographic officers" are not developed.

b. A Topographic Officer stigma exists; topography represents a tortuous career and once assigned to a topography position, continued reassignment follows.

Agreement is widespread concerning education requirements for officers who pursue topography. Officers who access with a technical background, and who are selected for advanced civil schooling, should obtain advanced degrees in geodesy, cartography, or photogrammetry. On the other hand, many positions exist in Army Topography where related disciplines such as geology, geography, forestry, agronomy and hydrology are appropriate.

The Army Education Requirements Board validation system for designating those positions requiring advanced degrees was accepted as adequate and working well. Conversely, the system for selecting officers to attend civilian universities to fill validated shortage discipline positions is perceived to be heavily dependent on demonstrated performance (not necessarily topography related) and officer availability, and lightly dependent, if at all, on officer performance and future career development implications. Evidence exists to support these perceptions based on the designation of officers to acquire topography related advanced degrees who have little personal or professional interest in the field.

There is little provision under the current OPMS for officers with related specialties and with personal interest or educational background to

to participate in Army Topography without acquiring SC21 as an additional specialty. Such a system causes participants to be vulnerable to assignment to dozens of SC21 positions for which they are not interested or not qualified. SC35 (Tactical and Strategic Intelligence) is considered to be a very closely related specialty and easily substitutable in many 21D positions; however, less than 50 officers possess that specialty combination. A greater potential officer skill base exists if the system would allow such officers to participate in topography without becoming encumbered with the total spectrum of SC21 responsibilities and assignments.

Officers who do spend repetitive assignments in Army Topography have insufficient time to accomplish the other career "pulls," such as attaining and maintaining proficiency in another specialty, becoming qualified in other SC21 activities (combat engineering, construction management . . .) and serving in other Army assignments (DA Staff, Recruiting, ROTC or USMA Instructor . . .). Topographic skills are, however, considered to be generally transferrable to other engineer, intelligence, and technical specialty areas, whereas other technical skills, except as noted, are not generally transferrable to Army Topography.

Proponency.

The Chief of Engineers is the proponent for Army Topography. The link of topography to the Corps of Engineers is topography's relation to the traditional function of land surveying. That link exists almost exclusively through history and tradition; land surveying is seldom used today for topographic control. Like other functional areas, the responsibility for Army Topography has now been disseminated by assignment of subfunctional responsibilities through the Army Staff. The ACSI is responsible for General Staff supervision and the COE supports other Army Staff agencies

with coordination and the technical supervision of mapping, charting and geodesy.

Examination of the recent past indicates considerable interest from the intelligence community in Army Topography and a perceptible shifting of portions with intelligence applications away from the Corps of Engineers. Examples include the recent action placing the 652d Engineer Battalion (Topo) of WESTCOM under operational control of INSCOM, and the doctrinal debates concerning potential assignment of the terrain detachments from the topographic battalions to the forward divisions. Because the mix of strategic versus tactical mission requirements may be different in the Pacific Theater from those of similar units in Europe, the precedent now established for operational control may not be a valid basis on which to establish doctrine. The more central argument seems to center around the terrain detachment--its principal purpose and mission, who owns it, and where it will live.

The fundamental question raised by this discussion, for the purpose of this study, goes beyond the near-term mechanical manipulations and seeks to address where Army Topography should or will go in the future--and the best way to support it with qualified officers. The scope of such an effort is prohibitive from the standpoint of the Engineer Professional Development Study, but insights can be obtained by development of a simplified scenario for the future of current topographic functions.

Survey. Survey support for weapons systems may largely disappear in the next decade as an Army Topographic requirement if proposed systems become operational as planned. Field Artillery can become self-sufficient for survey support. Other survey requirements, which will certainly exist, could be accomplished by topographic units or by other means such as adoption

of doppler systems (2d order accuracy) by other type engineer battalions. The next decade will see revolutionary advances in navigation and positioning capability.

Map Reproduction and Distribution. Reproduction for map stockage is accomplished by DMA and through host nation agreements. However, it will be essential to retain the capability in the field to support contingencies and provide back-up capability for potential map losses via long lines of communication. Requirements for map distribution will not change appreciably in the next decade and the capability for distribution probably will not be substantially improved. Map Distribution Platoons at Corps and Army level establish depots, and they, or similar organizations, will continue to be required.

Terrain Analysis. Users of terrain analysis and related products (orienting at division level) include the Engineer (Terrain reinforcement, barrier planning . . .), Support Command (logistics, LOC planning . . .), Intelligence (enemy orientation), Aviation (routes of ingress and egress . . .), and others. Fundamental use is, and will continue to be, in support of operations of all types; future proponency must consider, as it has in the past, broad operational applications and orientation.

Assessment suggests that the production functions (map reproduction, limited map update, distribution, survey) clearly remain engineer oriented and, with the exception of survey requirements in support of weapons systems, will not change radically in the foreseeable future. The survey function possesses the greatest potential for change, and without attempting to qualify precisely how it will change, it is safe to project radical change in the decade of the 1980s. Terrain analysis has broad operational applications, and its total integration into the combined arms system is essential. In

general, topography will become an increasingly technical function and will demand a higher level of technical skills from the Officer Corps.

Army Topography, and the personnel system to support it, must position itself to support Army requirements without substantial change for the next five years. It appears that the 1985-1990 time frame will be a period of transition whose direction will be indicated by evolutionary and revolutionary technological developments in topography itself and the requirements generated by the Army of the 1990s.

Conclusions (Topography)

a. The foregoing discussion suggests that in a broad context, the objectives of OPMS are not being met.

(1) Officers are not being developed and trained in the right numbers and with the right skills to satisfy Army Topography requirements.

(2) Army Topography assignments are not perceived to capitalize on the individual's competence and desires.

(3) The dual specialty professional development system is too disciplined and restrictive in terms of utilization of the interest or skills of the maximum segment of the officer corps and not sufficiently disciplined to support the job satisfaction which leads to professionalism.

b. Army Topography meets the essential requirements for a separate specialty--"a grouping of duty positions whose skill and job requirements are mutually supporting in the development of officer competence to perform at the grade of colonel in the specialty."

c. There are insufficient Army Topography company grade and junior field grade spaces in the structure to properly develop the required numbers of senior grade (colonel) officers.

d. Sufficient civilian spaces exist in the Military Topographic Community structure to convert to military spaces as required.

e. OPMS does not currently group Army Topography and related positions which share common skill and job requirements, to facilitate maximum utilization of qualified officers.

f. OPMS should consider that Army Topography will probably not change substantially through the next five years, but beyond that it will transition to an activity in the 1990s which may require a different or broader skill base from the officer corps.

Professional Development Objectives (Topography)

a. Provide adequate Army Topography and related spaces to train the right numbers of officers in right skills to support O-6 requirements.

b. Provide system which:

(1) publicizes topography and related fields at officer entry level;

(2) provides well defined career development pattern (preferably for hard and soft skill officers);

(3) identifies officers with personal and professional interest, to maximum possible extent, for entry into the field;

(4) supports job satisfaction and professionalism, well defined career pattern plus rewards (training, education, promotion),

(5) absorbs officers with other related specialties; and

(6) allows for specialization in topography and related fields and provides for essential cross fertilization.

CURRENT ISSUES

General

During the course of this study numerous issues cutting across the spectrum of professional development were surfaced. This section discusses these issues, which significantly affect support in the functional areas.

Issues.

a. Officer Personnel Management System (OPMS).

(1) Problem. There is a widespread dissatisfaction with OPMS, as presently executed, throughout all ranks of engineer officers.

(2) Discussion. OPMS has been discussed in some detail earlier in this chapter. However, field interviews indicate such a pervasive dissatisfaction within the force, that it may represent the most emotional concern of every grade.

As previously noted, OPMS is not adequately preparing engineer officers in the field of construction management. Not enough experience in Construction Management is gained prior to attendance at a Senior Service College. At the opposite end of the spectrum, the dissatisfaction among company grade officers stems from a lack of confidence in the system. At the mid-range level, Battalion Commanders are reluctant to offer career advice to officers that may be inconsistent with what they perceive to be a radically changing environment. Majors who aspire to battalion command are torn between accepting assignments in their alternate speciality, civil works, high level staff, or battalion level troop positions.

The dilemma is best illustrated by a recent occurrence in USAREUR. A MILPERCEN team advised engineer majors to seek troop duty for career enhancement, expecially if that major had not had troop experience as a field grade officer. These were the very same engineer majors who had been receiving assignments to other than troop positions, despite extraordinarily high utilization rates (89%) for engineer majors.

Another dissatisfaction voiced by engineer majors was the perception that fully funded civil school allocations had declined over the years. This perception is supported by the quotas in recent years. From 1969

through 1979, advanced civil school graduates have declined significantly. Graduates in all engineering disciplines have declined from a high of 328 in 1971 to a low of 105 in 1977. In civil engineering alone there were 69 graduates in 1969 compared to 27 in 1977. (See Annex B)

For the junior and middle ranks the dissatisfaction with OPMS appears to be related to unsatisfied personal and professional goals, coupled with a distinct perception that no one is managing engineer officer development. The perception of the CGSC engineer students is that OPMS simply fills requirements, with little regard for experience or preference of the individual officer. Although this perception is not new to the officer corps, a key difference may lie in the perception that under the old branch system a career manager appeared to guide the officer along a path designed to fulfill Army requirements as well as the officer's potential.

The reasons for the lack of universal acceptance of those assignments necessary are many, but one of the strongest appears to be a general lack of confidence in assignment policies and the subsequent development process. Many officers, not knowing what they need and how best they can contribute to the Army are not willing to accept MILPERCEN advice. Officers therefore become disgruntled because they do not receive the assignments that they want for job satisfaction and advancement. The sensing was that about half of the current CGSC engineer students prefer duty totally within the engineer troop or civil works spheres, even if that means a cap at the 05 level for career progression. The other half desired the flexibility of filling other than SC 21 jobs. At the time of the interviews MILPERCEN had not announced the reorganization into speciality offices designed to better serve a specific speciality code. The perception that there is once again an engineer "branch" managing engineer officer careers may dispel much of the present lack of confidence in OPMS.

Despite the lack of confidence in OPMS, the reasons that engineer officers give for leaving the service are in most cases not related directly to OPMS, but to the elasticity of the times we live in. As the attractiveness of military service declines, the pay decreases, and the benefits are eroded, engineer officers are among the first to look other places for job satisfaction and remuneration.

Additionally, some dissatisfaction is attributed to OPMS by senior officers who must operate with untrained engineers in jobs where there is little room for error. In peacetime, the most serious cause for concern is the lack of training for construction managers in civil works and in facility engineering assignments. All District Engineers and Facility Engineers interviewed indicated that it is as important for a DE or an FE to have had prior experience in the field of contract construction management as it is for a Brigade Commander to have had experience with troops. Yet less than half of the SSC selectees have had that experience. Senior Service College selectees from the 77, 78, and 79 lists all had battalion command experience, but only 54 percent had any construction management experience in either a district or facilities engineer orgnaization. However, of the current District Engineers and 06 Facility Engineers, 90 percent have had construction management experience prior to their assignments (but only 47 percent were SSC graduates). Since 97 percent of the command selectees from FY's 77, 78, and 79 were SSC graduates, but only 71 percent had prior CM experience,

it appears that the Army is placed in the position of drawing from a narrower population of experienced, proven performers than is optimal.

Analysis of the time available for construction management experience between CGSC and SSC shows time for only two or three PCS assignments. If one of these assignments is Battalion Command, as it now must be to qualify for selection to District Engineer, then it is obvious that requirements for construction management experience, alternate speciality, troop unit, and other army requirements cannot be fulfilled. Evidence shows that utilization rates for engineer officers have all but eliminated chances for an assignment in an alternate speciality, and that construction management assignments are either left unfilled or occupied by officers who probably will not gain the opportunity for battalion command.

(3) Conclusion.

• Dissatisfaction with OPMS on the part of engineer officers is wide spread. Some can be attributed to misinformation and misperception rather than to valid complaints.

• Shortage of officers and the circumstances of the times we live in may contribute more to the dissatisfaction than OPMS actions.

• Establishing better career development models for use by the officer, MILPERCEN, and career advisers throughout the army, and the reinstitution of a semi-branch system in MILPERCEN should give officers a sensing that there is someone looking after their careers in the Corps.

• Creating alternate, feasible, legitimate career patterns that flow through 06 will alleviate considerable frustration.

b. Professional Engineer Registration

(1) Problem. Although professional registration is neither a requirement for engineer officers, nor a written prerequisite for any assignment in the Corps, there is a perception in the field that registration may be a positive but unwritten requirement for advancement imposed by the Chief of Engineers.

(2) Discussion. The present Chief of Engineers has been more active than other Chiefs in recent memory in promoting the desirability of Professional Engineer Registration. Although the Corps has always advocated professional registration as being one of the hallmarks of the professional officer, never has registration been so implicitly linked to career success. Since the majority of the company grade officers and many field grade officers in the Corps do not now have, nor seem to be oriented toward professional registration, the issue is highly emotional and a very real source of concern to Corps officers. This study examined the situation from the standpoint of the current status of registration in the Corps and in terms of reaction by engineer officers.

(a) Status: Army-wide and engineer specific personnel policies for the past 10 - 20 years have produced a Corps of Engineers which has not put a premium on professional registration. Current data show:

-Of 41 District Engineers, 29% are not professionally registered.

-Of 107 Facilities Engineers, 54% are not professionally registered.

-Of 78 engineer selectees from the 1978 and 1979 06 promotion boards, 39% were not professionally registered (but 88% had battalion command).

-Of 68 engineer 06 command selectees from the 1977, 1978, and 1979 lists, 45% were not professionally registered (but all had battalion command.)

-33% of the engineer company grade officers (17% of the engineer officer corps) do not possess engineer or related degrees; their ability to obtain professional registration is problematical at best.

(b) Perceptions: Interviews conducted across a wide spectrum of engineer officers, including District Engineers, revealed the following views were held almost unanimously:

-Recent COE communications convey the message that the opportunity to be assigned as a District Engineer may well depend upon the possession of PE registration.

-District Engineer success is not predicated upon the technical engineering competence which PE registration validates.

-PE registration does give credibility to officers assigned as District/Facility Engineers, and enhances the position of the DE/FE in dealing with contractors and civilian subordinates.

-PE registration is not essential to the successful performance in any engineer assignment and should not be made a prerequisite for particular assignments.

-If PE registration were made a requirement, accessions would become even more difficult and retention would suffer.

Field grade officers tended to believe that engineer officers should be both professional military officers and professional engineers. While younger officers were inclined to view registration as a personal goal which should be kept as an option instead of a requirement (the latter view tempered, perhaps, by the large population of junior officers who do not possess an engineer or related degree).

(3) Conclusion.

• PE registration is not essential to successful performance in engineer assignments, but is highly desirable for credibility and professional standing.

• Encouragement by the COE for increased professional registration within the specialty reinforces a desireable objective for career development.

• If professional registration is to be a requirement across the board or as a prerequisite for particular assignments, a significant change is required in policy in assignment patterns, and in the number of graduate level school quotas. A change of this magnitude should be studied and carefully managed in its implementation over time.

c. Multiple 06 Command.

(1) Problem. Present policy precludes 06 engineer officers from serving in more than one command assignment.

(2) Discussion. In the past, certain highly qualified engineer Colonels were given the opportunity to command a troop unit and also serve as a District Engineer. This practice culminated the broad background experience that is considered to be extremely valuable for engineer general officers. Current policy prevents an engineer officer at the 06 level from both a troop unit and an engineer district. This policy tends to add credence to the Chief of Engineers' concern that OPMS is tending towards not qualifying the best engineers to become general officers.

Although officers at the 06 level have essentially completed their career development assignments, a dilemma arises for the 06 troop commander selected for 07, who has not had previous engineer district experience. This dilemma is reinforced by the logic that suggests a prerequisite for success as a Division Engineer is experience as a District Engineer. A different situation, but similiar dilemma, occurs for the 06 command selectee who is assigned as a District Engineer and has little or no experience in

that activity. Both situations are represented as a statement of "risk" by the Chief of Engineers. These dilemmas are caused by the Army's central selection system and priorities.

Assignment as a Facilities Engineer (FE) at the 06 level offers a partial solution for the 06 troop commander who lacks experience. The FE designees are not command selected and while it is debatable that such assignments provide all of the desired construction and contract management experience gained as a District Engineer, certainly a portion of the skills and experience are equivalent. The 06 District- Engineer Command designee on the other hand, qualified for selection principally because of previous success as a troop commander. The lack of opportunity to command soldiers at the 06 level may be perceived by central selection boards as lack of sufficient qualification for further advancements.

(3) Conclusion.

- Current policies notwithstanding, the opportunity to serve as both a DE and a troop commander is extremely valuable to the Army and the officer.
- This study concludes that decoupling the district engineer position from the command selection process allows the opportunity for officers to better serve the Army.

d. Women in the Corps

(1) Problem. The Army's combat exclusion policy precludes the SC 21 female officer from complete development as an Army engineer.

(2) Discussion. Women officers in the Corps of Engineers present special challenges to OPMS. Since the Army's combat exclusion policy

precludes females from serving in 21A, Category I units, a female engineer officer does not have every training opportunity or every career option available to a male officer. Without a substantive change to that policy, either in the case of the guidelines of DA Phamphlet 600-3, or under the concept of professional development outlined in Chapter 3 of this study, a woman would not be permitted to serve as a Battalion Commander in any of the combat battalions.

This exclusion policy exacerbates the professional development problems for the relatively small numbers of female officers in the Corps. As of 18 January 1980, the number of SC 21 female engineer officers totalled 1.7 percent of the Corps' officers. All female officers are in the grade of captain or lieutenant. For the female officer looking ahead to promotion to 06 or selection for SSC, the chances of gaining battalion command are nearly nonexistent. As long as the present status quo remains unchanged, battalion command represents a prerequisite for selection to 06 and to SSC.

As verified by the field interviews, most engineer officers believe that the time tested way to advancement is by following the troop track. Yet female officers are excluded from the combat unit troop track entirely, and face tough competition in the noncombat units. If all 18 of the present SC21 female engineer captains were to stay in the Corps and be promoted to lieutenant colonel, they would be competing with ten times as many male officers for the limited number of noncombat battalion command positions.

Although it is not envisioned that the combat exclusion policy will soon be changed, special instruction to selection boards regarding female engineer officers could allow fuller career development in other engineer areas. For example, SC 21 females could fulfill their troop experience requirements for the first five years of service, including company command, and then focus their career patterns in the area of civil works, facility engineering, or topography. If battalion command were not a constraint to advancement, there would then be no institutional barriers to the female officer for selection to SSC and district engineer. As it stands now, even the best SC 21 females have no more chance for full career development than a male who was nonselect for battalion command.

Considering the facts that the Corps continues to experience severe officer shortages, that the manpower pool shows a trend downward, while at the same time women are graduating from West Point and more women are entering engineering disciplines in college, women do represent a potential engineer officer resource. However, given that the exclusion policy is expected to be maintained, the present OPMS policies for engineer career development must be modified if the female officer is to have the same opportunities to fulfill her potential as her male counterpart. Once a female officer has served for enough years to understand what a future in the Corps could mean, she could only view her chances for advancement as an argument to separate from the service. If she is a competent officer, her separation is a loss to the Corps. In addition, after a few years of separated engineer female officers returning to campuses, accession of female officers would be even more difficult.

(3) Conclusions.

• Under the combat exclusion policy, OPMS does not allow the SC 21 female to fully develop to her maximum potential.

• Given the current and projected shortages of engineer officers all available sources of potential engineer officer talent, to include females, must be exploited.

a. Force Structure - Accession Methodology.

(1) Problem. Current accession methodology does not provide sufficient engineer officers in the proper grades to satisfy force structure requirements.

(2) Discussion. The existing force structure presents a unique challenge to the force planner. The profile of the engineer speciality as shown below demonstrates some serious anomalies.

SC 21 Profile

CATEGORY	COL	LTC	MAJ	CPT	LT
Designated	256	591	819	1379	1721
Controlled	238	405	588	829	1213
PERSACS AUTH	235	533	738	1410	1015
ODP	196	422	581	809	1429
THS	16	35	96	226	392

Table 2-5

In the critical phases of development and into the initial phases of utilization, there are insufficient assets to meet the basic space requirements (PERSACS). Additionally, the present scheme attempts to expand a smaller number of 02-01 positions into a larger number of 03 training opportunities. The hidden difficulty, however, is that such a plan assumes an accession rate and a retention rate higher than presently experienced.

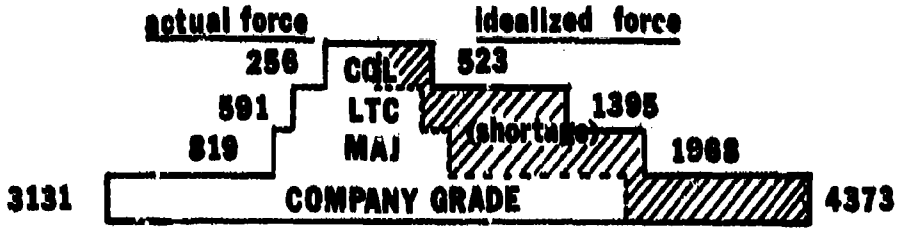


Figure 2-2

The Officer Force Management Plan (OFMP) develops an idealized force structure operative in conjunction with the OPMS philosophy. The accession plan, under OFMP, shown in figure 2-2, would provide an engineer force whose utilization rate at every grade would approximate 50 percent and thus be comfortably within the objective range for utilization rates (33-67%). One difficulty, however, with the OFMP force structure is that it includes as one of the key assumptions a planned force strength discontinuity at the eighth year (figure 2-3).

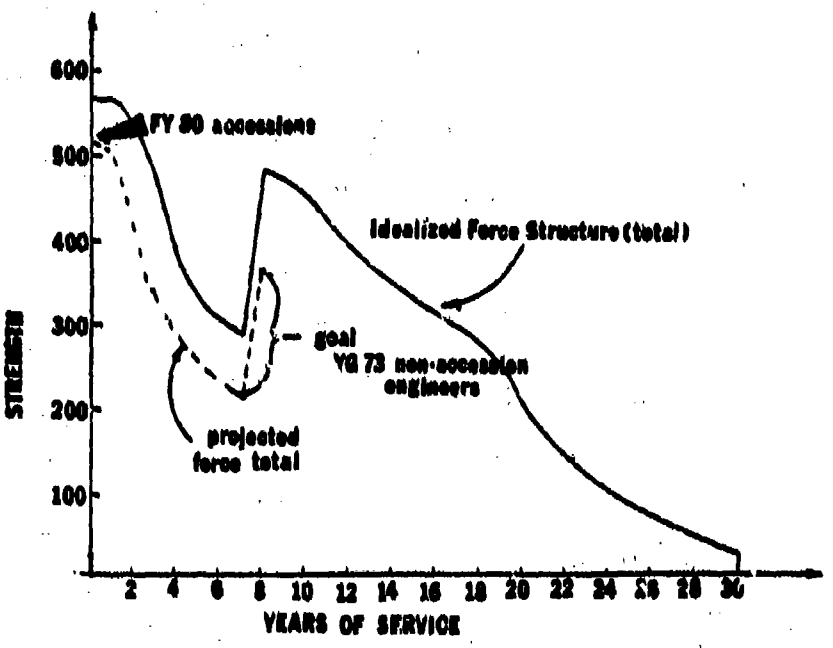


Figure 2-3

Since OPMS began, 160 officers have been designated nonaccession engineers. The target for YG73 is 151; a number nearly equal to the 8 previous year groups; an ambitious undertaking at best. Without hard data, it is impossible to deduce the impact of this decision on quality, capability and later retention of those designated.

(3) Conclusions.

●. Numbers of engineers even under the recent accession policy and distribution plans are inadequate to man the force and to grow the proper numbers of senior grades.

• Absolute numbers of engineers are grossly inadequate if OFMP establishes the base requirement.

• A force structure model with a planned discontunity whose attainability is questionable, demands reevaluation and possible rethrust.

• Accessions (even taking the most optomistic figures) have continueously fallen short of the goal, the numbers of non accession engineers have not comensurated for the deficiency at the 8th year point, and losses are increasing.

f. "Up or out" policy for engineers.

(1) Problem. Under the present "up or out"policy, the corps is losing many trained engineers who could continue to contribute. For SC 21, this policy exacerbates the critical problems caused by officer shortages.

(2) Discussion. The Study Group supports the "selective continuation" program for non-select reservist. Under this program, that began earlier this year because of a congressional directive, reserve officers on active duty twice non-select for promotion may be voluntarily extended for three years if they have a skill in short supply and are recommended for retention by the board.

The logic for this program has its roots in military history. There are numerous examples of elite military units which possessed a cadre of long term, small unit leaders. In all these military units it was recognized that an officer might well be a superb company commander for his entire career. Little pressure existed to force him to prove that he was a potential field marshal. It was not uncommon for an officer to serve his entire career as a company leader, either dying in battle or passing quietly into retirement as a captain or major after twenty, thirty or more years of service.

The current shortages of captains and field grade officers make it

difficult to justify separating from the Army officers who may not appear to have the potential for positions of increased responsibility and hence promotion, but who have demonstrated the ability to serve in their current grade. It is difficult to justify separating the "professional" Company Commander when we are forced to place inexperienced Lieutenants into command positions. We should not discard an officer for merely failing to be promoted on schedule, but should capitalize on his expertise and experience if in short supply in the Army.

There are numerous examples of officers, especially at the field grade level, who have developed a depth of expertise in a specific functional area, but because of some blemish on an efficiency report or an assignment quirk they will not be promoted. These officers still have much to offer in their speciality. The Army cannot afford to loose the technical expertise of these officers, since in many cases there is no one to fill the vacancy created.

(3) Conclusion. In view of continued and projected engineer officer shortages, the Army should no longer support an "up or out" policy for SC 21.

g. Distribution of officers.

(1). Problem: Officer discribution priorities(as reflected by the Department of Army Master Priority List(DAMPL) an Officer Distribution Plan(ODP) do not equitably distribute engineer officers to adequately support the Army across the spectrum of requirements.

(2) Discussion: MILPERCEN assignment policies for captains through lieutenant colonel are a product of special distribution guidance from DCSPER reflecting VCSA directed assignment priorities for "proven performers." The term "proven performers" is an indication of quality and is determined by a subjective categorization of demonstrated manner of

of performance by thirds (upper, middle, lower) reflecting an officer's relative standing among his peers.

MILPERCEN uses a predetermined distribution goal based on manner of performance to distribute officer quality. This performance model reflects desired organization and activity performance content as a norm against which performance distribution can be controlled. Each command is supported with a minimum (floor) number of upper third (U/3) and middle third (M/3) officers and a maximum (ceiling) number of lower third (L/3) officers. "Designated" organizations and activities, Department of Defense, The Army Staff and Field Operating Agencies, ROTC Senior Instructor Groups, USMA, USAREC, MEPCOM, CSC and TAG, have a quality model composed of one-half U/3 and one-half M/3 for given ranks, LTC-CPT. "Designated" organization and activities do not receive L/3 officers.

In addition to excluding the assignment of L/3 officers to "designated" organizations and activities, the current ODP supports "designated" activities at 100% of authorization by grade. The shortage of SC21 officers (COL-CPT) and L/3 officers is distributed to such "non-designated" organizations and activities as USAREUR, EUSA, WESTCOM, FORSCOM, TRADOC, and OCE-Military. These units bear a disproportionate share of SC21 shortages and are forced to accept a significantly less percentage of "proven performers."

(3) Conclusions:

- Reexamine the number of "designated" organizations and activities with a goal of eliminating this discrimnation.
- Special officer distribution guidance should be modified to insure:
  - Officers are assigned based on ability to do the job.
  - Upper third and lower third officers are uniformly

assigned throughout the Army.

- All organizations and activities share proportionately the 8C21 shortage.

CHAPTER III

CONCEPT FOR PROFESSIONAL DEVELOPMENT

This chapter presents in three sections a concept for engineer officer professional development and suggests a structure for developing the personnel management system required to implement it. The conceptual framework developed in Section I is transformed in Section II to a model that displays the engineer requirements spectrum and establishes professional development and utilization objectives. No attempt is made to present a detailed design of the personnel management system required to initiate and sustain the professional development concept, but taken together, Sections I and II provide the direction, rationale, and essential parameters of the system. With the exception of numbers of O-6 commands and proper support of Army Topography, transition into such a system is feasible without significant discontinuities or changes to the current management system. The topographic dilemma was discussed in detail in Chapter II, and the recommended changes are incorporated herein. This proposed professional development concept requires significant change to the current O-6 command policy and selection process; section III outlines the details and rationale for the recommended adjustments to the existing policy.

At this point it is beneficial to review the engineer officer requirements structure for which the system must develop officers. The OPMS is designed to manage officers within a set of requirements that conforms to the classic pyramid structure. Figure 3-1 indicates that the utilization rate for SC11, 12 and 13 field grade officers in their primary specialities is 30 percent to 50 percent--as planned.

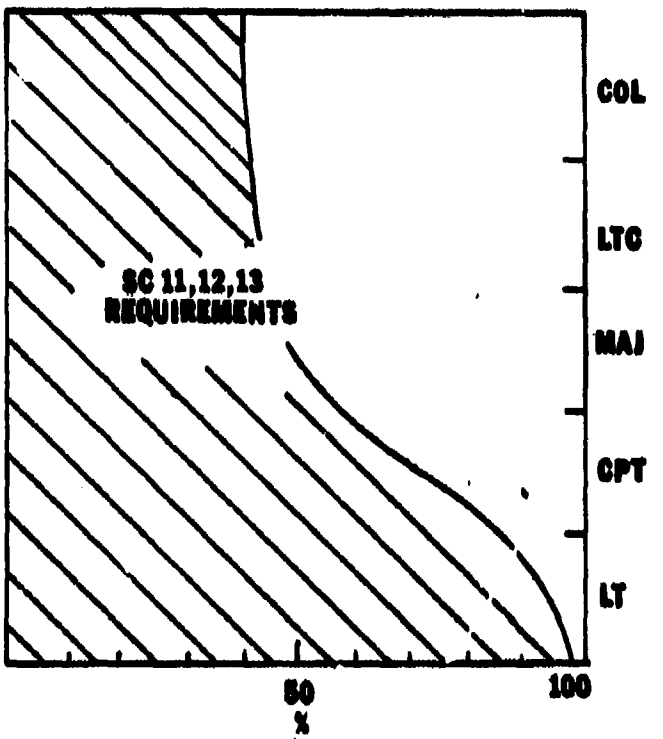


Figure 3-1. SC11, 12, 13 Utilization Rates

Figure 3-2 presents the same data for SC21. Speciality Code 21 requirements at all grades are nearly equal to the officer population available to fill them. (The requirements exceed the population for the grade of O-3). Note that there is no parallel in senior officer utilization rates for engineers as compared to the SC11, 12, 13 officers.

Chapter 1 identified three virtually absolute filters through which an officer must pass to qualify for O-6 command and potential selection to O-7; CGSC (100%), battalion command (100%), and Senior Service College (97%). Figure 3-3 displays how engineer officers are assigned in the structure by grade. The danger of an officer concentrating in troop assignments to qualify for the "O-5 command gate," at the expense of qualification in construction management and other jobs, is obvious; over 60 percent of the O-6 level SC21 requirements are in construction management for which he has not been prepared during the developmental phase of his career.

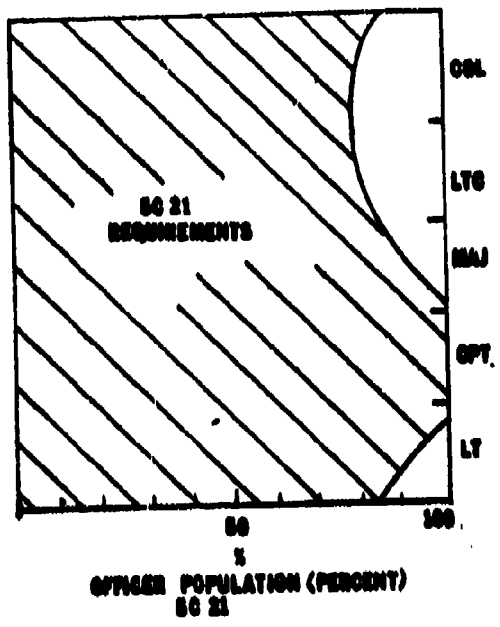


Figure 3-2. SC21 Utilization Rates

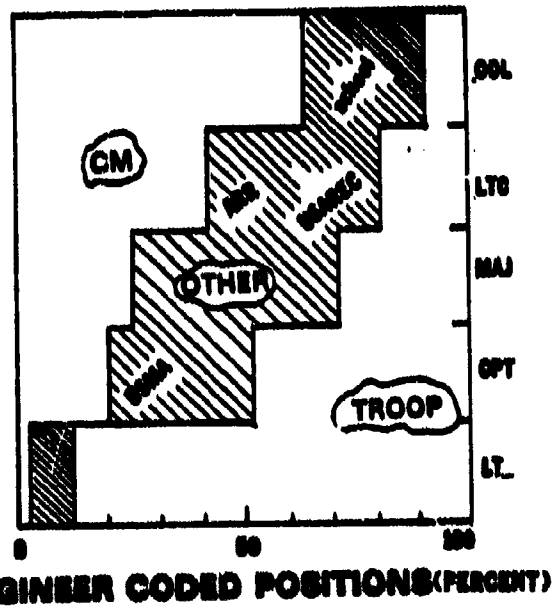


Figure 3-3. Engineer Coded Positions (by grade)

The concept that follows emphasizes the importance of troop assignments while permitting quality engineer officers to gain experience during the developmental period by alternate patterns that may exclude battalion level command without career penalty.

Section I
CONCEPT

General

The concept developed in this section is based on the spectrum of engineer requirements facing the military engineer and the collective judgment of the study group. The foundation is developed sequentially from three discrete sets of information--the requirement base (what is desired); a set of observations and assumptions regarding the expectations of the institution and the officer; and the characteristics of a system dictated by a need to satisfy these requirements.

Requirements of a Professional Development Model

Characteristics and objectives of any professional development concept evolve from a statement of purpose. In general terms, the system of personnel management must provide sufficient competent and well-motivated engineer officers to meet Army and national security needs. More specifically, a system is required that:

a. provides sufficient competent and well-motivated personnel to man organizations which can provide adequate support to the Army across the total spectrum, ranging from battlefield support to special engineering tasks;

b. provides an officer corps with adequate depth of experience and training to maximize the opportunities for leadership of engineer organizations that demand special skills and competence, particularly during the utilization phase of their career of service;

c. retains the versatility, hence flexibility, of the Corps of Engineers by insuring its members remain broad-gauged and able to contribute judgements and perspectives which transcend a more narrow functional expertise; and

d. permits the management of officer career patterns so as to maximise their personal satisfaction and increase the propensity for a full Army career.

Observations and Assumptions

It is essential to meld certain characteristics of the officer corps as well as those of the Army in combination with the requirements of the system. Conflicting objectives occur and are recognised within the expectations of the body of the Corps of Engineers officers, and to some extent between the officer and the institution, but most of the expectations can and should be accommodated within the system. It is also recognised that while some of the conflicts may ultimately be irreconcilable within the current and projected environment, a relatively well defined professional development plan will highlight those at the outset. Given the broad spectrum of requirements facing the Corps of Engineers officer, the essential observations and assumptions that must be considered are as follows.

a. Not all officers have the ability, educational background, or the necessary training to do all jobs equally well.

b. Not all officers want to do all jobs in all spectrums of Army requirements.

c. Some officers' interests and talents align along the general military and combat engineering side of the spectrum while some officers' interests and talents align along the more technical engineering skills side of the spectrum.

d. Many officers are willing to accept reduced opportunity for promotion to and above O-6 provided they have achieved satisfaction from a

meaningful career that permitted them to develop and contribute their skills in alignment with their interests and talents.

e. Job satisfaction is known to result from doing a meaningful job compatible with personal interests, talents, and professional goals, and receiving recognition for doing it well.

f. Experience at different levels of assignment is necessary to achieve maximum development of executive level skills in areas such as combat engineering, command, contract construction management, or facilities engineering. It is possible for an officer to "survive" the management and leadership of a complex organization or task without prior experience. It is evident, however, that experience at multiple levels improves judgment, enhances leadership skills, reduces the learning times involved in the tasks, and increases the quality of the contribution of service.

g. It is extremely important to the Engineer Officer and the Army to insure a balanced exposure for all officers across the spectrum of Army activities during the initial or "developmental" periods of service in order to provide a qualified and versatile Corps of Engineer Officer.

h. There must be career development opportunities which shunt the existing absolute filters and provide reasonable growth patterns to O-6.

i. All officers must be provided the <u>opportunity</u> to acquire an additional specialty. It must be recognized that utilization rates as engineers will remain extremely high. Officer accession programs never have and are not projected to provide sufficient engineer officers to allow much more than 15 percent of the engineer officers to serve outside the engineer specialty at any time. The career development model must therefore be structured to develop an engineer population qualified to perform predominantly

engineer tasks.

Characteristics of the System

The professional development system must possess the characteristics which satisfy the engineer officer requirements of the system and optimize the development and utilization of the talents, skills and personal and professional expectations of the engineer officer corps. Career opportunity options must be available to permit some officers to concentrate in certain activities and develop depth of knowledge in these activities. Similarly, officers who demonstrate the talent, desire, and performance to operate across the entire spectrum should be permitted to do so. Successful accommodation of these objectives retains and revitalizes the initiatives and diverse challenges that have for so long characterized the Corps of Engineers and drawn talented officers to its ranks. Implicit in this discussion is the understanding that no penalty should be incurred by selection of either manner of professional growth. Penalties, whether actual or perceived, may cause quality officers to prematurely terminate service to the country in a uniformed capacity.

The characteristics of this proposed system are as follows.

a. The majority of senior Corps of Engineers Officers must be broad-gauged and versatile, experienced in both Army matters and engineering to support the Army and the nation. Their judgements and perspectives, especially at the senior grade level, must transcend their functional engineering expertise. They must be mainline military officers, capable of executive level contribution to provide engineering support to the Army in the context of national security.

(1) Officers must perform productively and gain experience across the spectrum of engineer requirements during the developmental period (the

initial 14-16 years of service, hereafter referred to as the developmental period). Engineer requirements are categorized as support to general army activities, battlefield support, support to the Army in garrison, and special engineering support to the Army and the nation.

(2) All officers in this developmental period must receive troop assignments to include company command and a certain amount of forced exposure to at least three of the four military engineer requirement areas. This procedure insures that the officer has an adequate background and a sufficiently broad experience base to prepare him for senior level decisions. In other words, the developing junior officer must learn about the Army and about how engineers support the Army with engineering.

b. Some Corps officers will wish to concentrate their development and later maximize their contribution to the Army in that particular area of the spectrum. Personal interests and a desire to increase depth of knowledge generates a tradeoff with narrowed breadth of experience. In terms of career development, this concentration represents a second assignment in a particular area prior to the 14-16 year point. Thereafter, within the established Army requirement base, these officers should be allowed to receive the majority of their assignments beyond the 14-16 year period (hereafter referred to as the utilization phase) in their chosen area of concentration.

(1) The benefits of such concentration would include a limited pool of officers with depth of expertise, and personal satisfaction for those officers who knowingly choose a career of depth instead of breadth.

(2) Career opportunity tradeoffs are generated. By choosing a career pattern of concentrated effort, there will be a tradeoff of opportunities since the majority of the top leadership of the Corps will continue to be selected from those officers who have demonstrated the ability and

willingness to perform well all the jobs of the military engineer. If an officer is clearly capable of commanding a tactical unit, working as a key member of the Army Staff, and executing district or division engineer assignments, that officer should not be denied those opportunities because of arbitrary restrictions based on prior experience. The officer who chooses to concentrate can expect to receive the majority of his assignment opportunities from a narrower spectrum. Officers whose principal assignments are with engineer units and in the training and development of combat engineers will compete for the assignment opportunities at battalion and brigade level with those officers who have not elected to concentrate but whose records demonstrate the requisite quality, desire and performance. Similarly, those officers whose interests lead them to concentrate on the more technical engineering support of the Army can expect to compete for assignment opportunities in engineer technical activities.

(3) Rewards for those who choose to concentrate must consist of assurance of opportunities to advance to the grade of O-6, to compete for leadership positions within their chosen area of expertise, and recognition and respect from the system for their increased depth and competence.

c. Career development opportunities necessary to accommodate both concentrated and broad spectrum career development require a positive bypass around the current battalion command selection gate to O-6 troop command and district commands. Decoupling district engineer positions from command designation and central command selection accomplishes both requirements.

d. Designation or selection of an additional specialty for engineer officers may be an academic exercise. Requirements for engineer officers will continue to place such extraordinary demands on the available population that service outside the engineer specialty will be severely constrained. Management

of such a population requires considerations which include:

(1) Requirements external to the engineer specialty do exist creating a need for a personnel management device that identifies an officer's personal strengths or interests outside the engineer sphere.

(2) To insure that specialties are mutually reinforcing, specialty selections should be paired in such a manner that knowledge gained in each specialty is transferrable, to some measurable extent, to the other. This will permit a balance between efficiency and broadening the officer's horizons.

(3) Most importantly, however, is a recognition that until the actual force structure sufficiently approximates the ideal force as outlined in the Officer Force Management Plan (utilization rates well within the 33-66% band), engineer officers do not have the opportunity and therefore cannot be required to develop or maintain qualifications in two specialties.

(4) The Army must not allow engineer officers to be penalized for doing a succession of those jobs which can only be done by engineers.

Section II
THE OUTLINE: A GROWTH MODEL CONCEPT

Introduction

This section provides an outline of a proposed career development concept upon which a management system can be based. The outline deviates somewhat from the career development concept currently in being. During the developmental phase engineers will be broad based, learning how to best support the Army and the nation. Provisions are made to permit an engineer to develop depth of experience for maximum utilization in the later portion of his career. A procedure is recommended that will allow an officer to aspire to meaningful jobs even if he is not selected by a DA board for a competitive school or command, thereby missing the absolute gates in the present OPMS situation. The model requires each SC21 officer serve initially with engineer soldiers

and successfully command an engineer company to complete the initial phase of SC21 qualification.

The Model

(see next page)

THE MODEL

a. What must Army Engineers do . . .

Category I—Support the Army by furnishing Engineer officers to serve in general Army activities such as . . .

- Training
- Recruiting
- Developing Tactics/Doctrine
- R&D
- Staff

Category II—Support the Army on the battlefield by providing engineer units. This involves . . .

- Training engineers
- Developing engineer requirements for materiel
- Manning engineer units and staffs
- Developing engineer doctrine
- Developing the rationale for an adequate engineer force structure including Reserve Components

Category III—Support the Army in Garrison thru . . .

- Facility engineering
- Planning/programming of facilities for the Army

Category IV—Support the Army and the Nation through Special Engineering tasks . . .

- Civil works and military construction
- Engineering support and services to other nations
- Mobilization and emergency planning
- Topography
- Engineer labs and R&D

b. To develop the ability and experience to provide these categories of support, Engineers should receive these types of assignments . . .

Category I:

- Any coded SC21 position which supports a common Army activity or staff
- Any assignment in a non-engineer specialty
- Common Army activities such as USMA, USAREC, etc.

Category II:

- Engineer troop units including command and staff
- Engineer training and doctrinal development activities such as Ft. Belvoir, Ft. Leonard Wood
- Engineer Member of a brigade or higher Army unit or general staff

Category III:

- Any assignment to an installation Facility Engineer organization or Director of Engineering and Housing
- Staff assignment performing planning or programming of MCA funds or other construction or maintenance for Army facilities

Category IV:

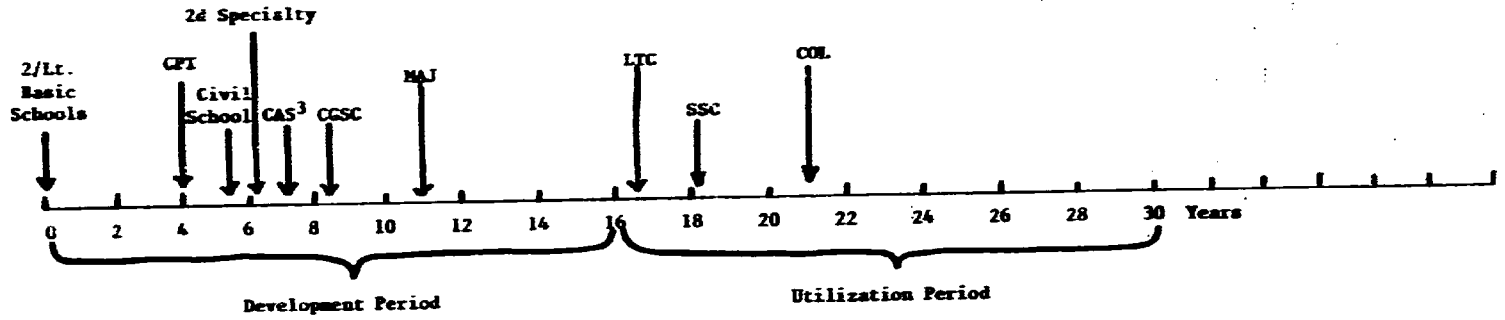
- Contract Construction management in an Engineer Division or District
- Engineer Laboratories and R&D activities such as:
  - WES
  - ETL
  - CERL
  - CERC
  - CRREL
- An Army Topographic Activity

c. These schools provide significant development of an officer's ability to contribute in all categories of support:

- EOBC
- CAS[3]
- EOAC
- CCSC
- Advanced Civil School and Professional Engineer Registration
- Senior Service College

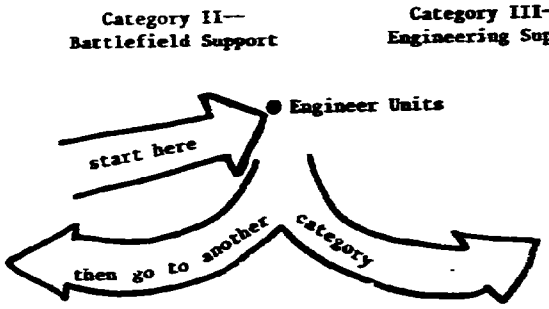
d. In order to develop and utilize engineer officers to meet these requirements, the following concepts apply . . .

(1) For the purpose of personnel management, an officer's career will be divided intc a development period (the first 14-16 years) and a utilization period (grades 0-5/0-6). With approximate promotion and school points added in, a career looks something like this . . .



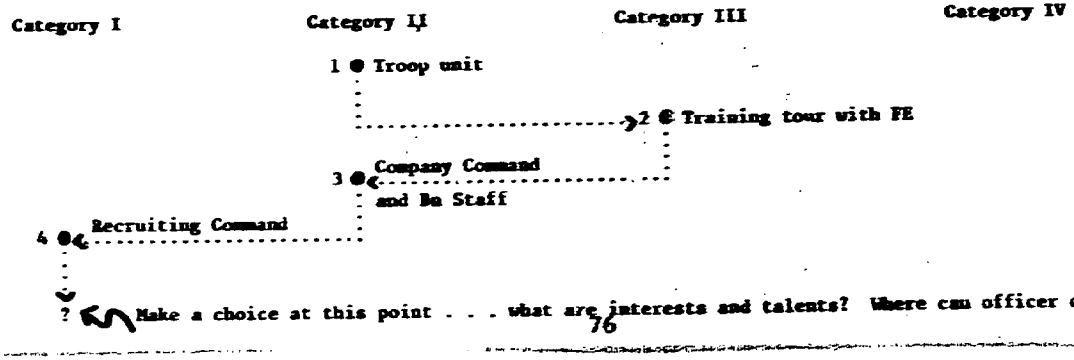
(2) Development Period . . . in order to develop the necessary broad base of experience and to better define talents and interests, an officer's developmental assignments will follow these broad guidelines:

(a) All officers must receive their initial assignment to engineer units (Category II) in order to gain basic branch experience (including company command during this tour if possible or on a subsequent tour).



(b) After an initial tour in a Category II assignment, an officer should be exposed to at least two other categories of assignment.

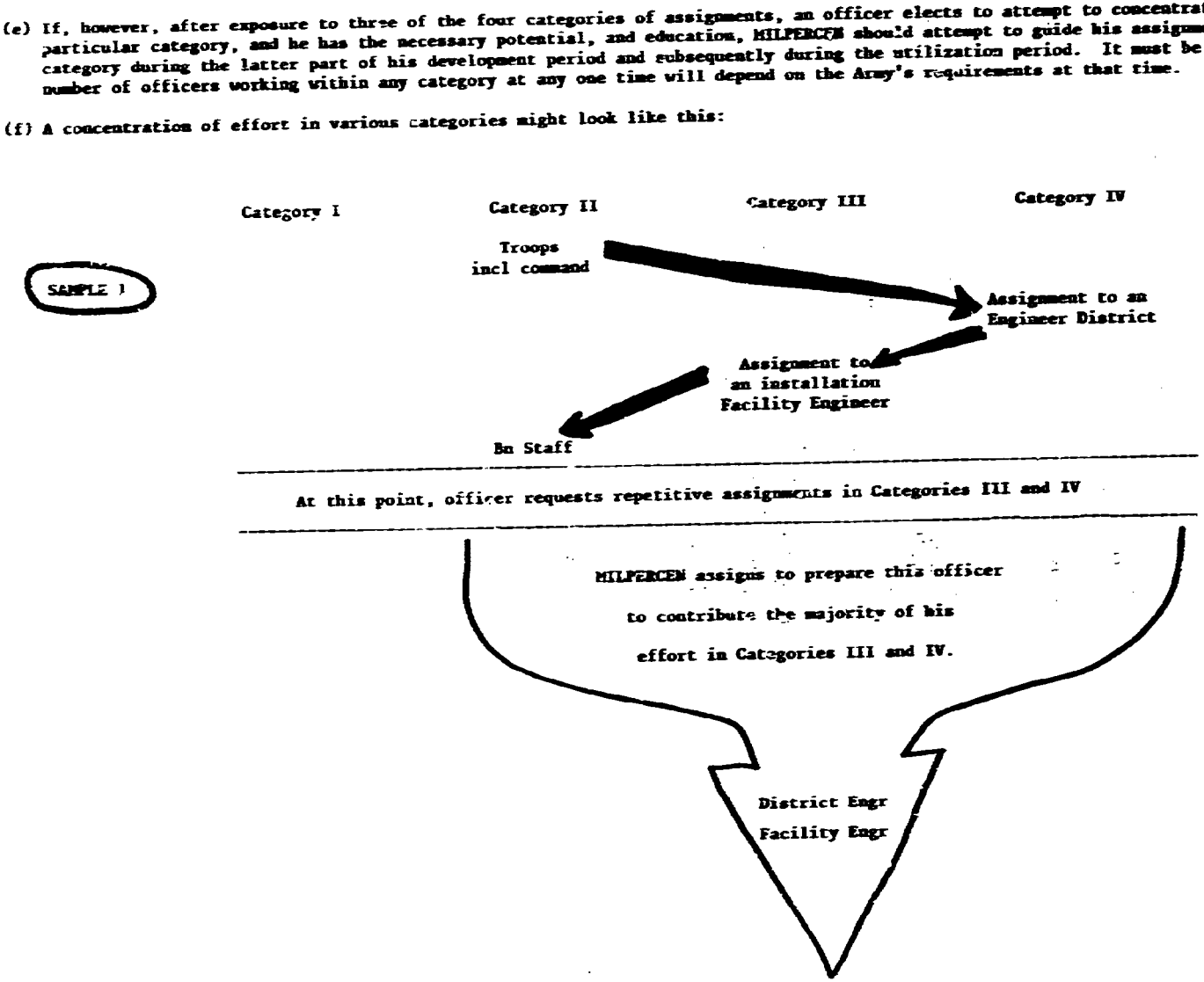
(c) Within the development period, a typical assignment history would look like this (excluding schools):



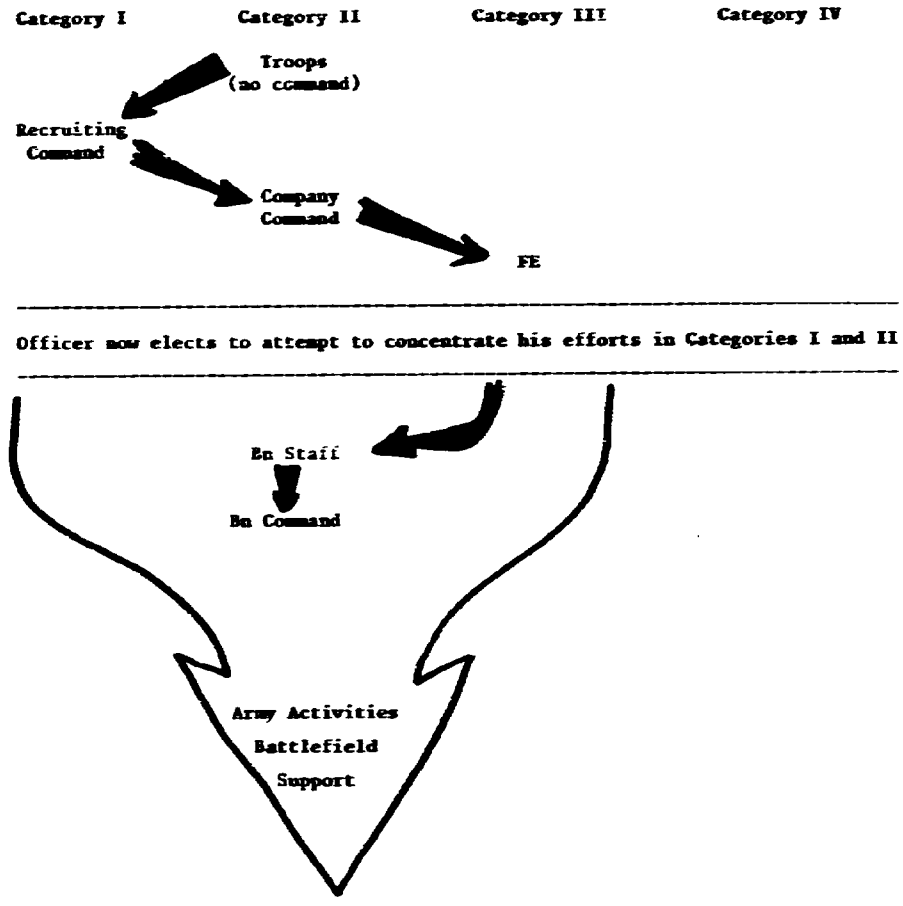
(d) After experience in three of the four categories, depending on officer preference and MILPERCEN's ability to accommodate, assignments may continue in this general pattern across the spectrum of categories including a second specialty throughout the remainder of the development period. Such broad experience best prepares the officer for executive level (grades 0-5/0-6) service.

(e) If, however, after exposure to three of the four categories of assignments, an officer elects to attempt to concentrate his efforts in a particular category, and he has the necessary potential, and education, MILPERCEN should attempt to guide his assignments into that category during the latter part of his development period and subsequently during the utilization period. It must be recognized that the number of officers working within any category at any one time will depend on the Army's requirements at that time.

(f) A concentration of effort in various categories might look like this:



SAMPLE 2



(3) Utilization Period . . . to maximize the contribution of the Officer Corps in the grades O-4/O-6, the Army must . . .

(a) Continue to utilize officers throughout the spectrum of requirements.

(b) Allow officers who have specialized in one particular functional area to serve repetitive assignments in that functional area consistent with the needs of the Army and the desires of the officer.

Section III
ELIMINATION OF COMMAND DESIGNATION OF DISTRICT ENGINEER POSITIONS

The Problem

From the early phases of the Engineer Professional Development Study, it was evident that the current central command selection process, coupled with command designation of DE positions, had manifested itself into some undesirable aberrations within the Corps of Engineers. Selection for (engineer) division command is based to some degree on a successful district command. District (or O-6 troop) command depends 100 percent upon successful battalion command and 97 percent upon SSC graduation; 100 percent of the battalion commanders were CGSC graduates and 70 percent had battalion experience as senior captains or majors.

Analysis

The aberrations are manifested in frustration. Colonel troop commanders are frustrated because they are not provided the opportunity to perform in an important and sought after DE assignment--one to which they had aspired and prepared. Lieutenant colonels who are not selected for battalion command fully understand the implications: they are virtually excluded from district engineer assignments and no options are available to change their future situations. Not only is there no opportunity for service as a district engineer but also potential for selection to O-6 becomes increasingly doubtful. These gates are absolute and final.

It is the perception of the Study Group that this finality is becoming the single most important cause in the premature retirement of talented and capable engineer officers. For every officer selected to command, there is a like number of equally qualified officers not selected

for command. Availability for assignment, background, previous jobs, levels of competence notwithstanding, only about 12 percent of the non-commanders will be promoted to O-6 and none will command soldiers or be district engineers. Additionally, the 30 to 36 month command tour policy exacerbates the inability of the non-battalion commander to visualize a reasonable route to the grade of O-6. The result is premature retirement of significant numbers of quality officers who have not yet reached peak utilization.

A fallout of this investigation was to evaluate whether engineer districts should continue to be designated as brigade level commands thereby requiring DA centralized selection of district engineers. The Study Group accepted this problem as one of the most important and the most agonizingly complex which had to be addressed. The advantages and disadavantages associated with evaluation of this problem are highlighted below.

a. Advantages of eliminating command designation of district engineer positions.

(1) For a few select officers, it provides an alternate route to O-6 which circumvents the 100 percent battalion command filter; a filter that is shrinking with the 30 month (±) command policy.

(2) The quality officer is provided an opportunity to serve both as troop commander and a district engineer; an advantage to the Army as well.

(3) There will be a greater population available from which to select the district engineer.

(4) It shunts the potential certainty that O-5 district engineers will not be recognized by central selection system for O-6 command.

(5) It provides the capability to incorporate the senior FE into DE population thus upgrading the quality of FE supporting the Army community.

(6) It brings O-5:O-6 command ratio into line with other combat arms (6:1 vs. 1:1).

(7) It more closely approximates the Army's view of O-6 command and treats the district engineer with the prestige associated with a project manager.

b. Disadvantages.

(1) COE selection of DE and senior FE can potentially revive the "old-boy-net."

(2) Engineer officers may develop a perception of the "old-boy-net" even it it does not exist.

(3) More difficult for O-7 selection board (or any other officer quality) screen. DE no longer command equivalent.

(4) Division engineer may not have been a district engineer, (a disadvantage under the current system as well).

(5) Loss of prestige associated with the reduction of engineer O-6 "command" positions (~51 to ~10).

As the absolute numbers of opportunities to command O-5 and O-6 troop units decreases, a greater portion of the engineer population will be distributed across the spectrum of requirements. Those quality officers who under previous policies would have commanded plus those equally qualified officers not selected for command, represent a segment of leadership critical to the Army and the Nation. Continued loss of that nucleus will have a debilitating impact on the future of the Corps of Engineers. Alternate, attainable routes for promotion to O-6 must be developed that recognize the reality that depth of experience may become an increasing norm.

The Study Group concluded that the advantages accrued to the Army and the specialty outweigh the disadvantages. Eliminate command designation of all

district engineer positions. It is essential, however, that adoption of this recommendation be accompanied by a DE/FE selection process perceived by the Army and the Corps to be completely objective. A strong apprehension exists among EN officers regarding the first two listed disadvantages.

CHAPTER IV

RECOMMENDATIONS

General

This chapter presents study recommendations. Development and structure of the study were designed to avoid specific recommendations until all analysis was complete.

Chapter I presented background information on the status of the Engineer Branch. Chapter II contained analysis of individual functional areas, in isolation, and a discussion of key issues which impact across all functions of the Corps. Within this rigid framework, conclusions were drawn and where appropriate, professional development objectives were developed.

Chapter III defined the fundamental requirements of the Army and the characteristics of the system needed to develop an engineer officer corps to satisfy those requirements. Professional development objectives were incorporated to the maximum degree possible; tradeoffs were necessarily made in terms of officer qualification, specialization versus generalization, officer assets available, and dozens of others. The rationale and essential parameters incorporated into the development model, and the model itself, constitute the principal recommendation of the study. Specific recommendations which contributed to or resulted from the growth model are summarized in six categories:

- Career Development
- Army Topography
- Accessions
- Officer Distribution
- Facilities and District Engineer Selection
- Facilities Engineer Structure

Career Development

- With the exception of Army Topography, do not establish other specialty codes within the broad field of engineering.
- Adapt current engineer officer personnel management to incorporate the direction, rationale, and characteristics of the professional development model presented in Sections I and II, Chapter III.
- Require all engineer officers to acquire an additional specialty after six years of service, subject to these conditions:
  - Until the actual force approximates the ideal force, engineer officers should not be required to develop or maintain qualification in two specialties.
  - The additional specialty will serve principally as a management tool for identification of personal and professional interest outside SC21.
  - The additional specialty should be parallel and compatible with SC21, with mutually reinforcing elements.
  - The Army must recognize that presently only approximately 15% of SC21 officers will be available to serve at any one time in non-engineer specialties.
- The incentive system must not be allowed to penalize engineer officers for performing a succession of jobs that only engineers can do.
- The personnel management system must be able to identify officers who possess a concentration of individual skills or other special talents by use of a specialty code suffix or other identification means, not another specialty code.
- An engineer organization must monitor engineer career development.
- Assuming the combat exclusion policy for female SC21 officers remains unchanged,
  - Female officers must be (are) accommodated within proposed career development patterns outlined in Chapter III.

- - Appropriate guidance to selection boards may be required (lack of troop assignment and command opportunity above company level) to articulate the professional development alternatives for any given year group.

- Support for all categories of SC21 officers, the "selective continuation program" for nonselect reservists.

- Reverse the downward trend of fully funded civil school quotas to assist in retention and qualification of junior officers.

- Institute and expand programs to assist "soft disciplined" SC21 officers to become "harder disciplined" engineers (Funded Civil School; CGSC Cooperative Degree Program; Degree Completion Program; ACPRD, Annex B, B-2).

- Incorporate in the EOBC curriculum, lessons on professional development to explain the totality of engineer requirements and career development options in each of the four categories of engineer support.

Army Topography

- Establish Army Topography as a separate nonaccession engineer specialty under the proponency of the Chief of Engineers.

- Designate officers into Army Topography between four and six years service.

- Provide adequate Army Topography and related spaces to develop the right numbers of officers in the right skills to support 06 requirements (align 03 and 04 Army Topography spaces with the Ideal Space Requirement as generally established in Table 2-4, page 40.

- Designate one or one plus Army Topography officer 06 commands.

  - - Select commanders using the Army central selection system.

  - - Candidate 06 command positions are Director, DMA Hydrographic Topograhic Center (rotational between Army and Navy); Director, Engineer Topographic Laboratory; Director, DMA Inter-American Geodedic Survey.

• Incorporate the following requirements into the Army Topographic personnel management system:

••Establish and revitalize programs to publicize topography and related fields at officer entry level (Officer Basic Courses, Engineer, Intelligence, ...).

•• Identify officers with personal and professional interest, to the maximum possible extent, for entry into the specialty.

•• Absorb officers with other related specialties.

•• Provide well defined career development patterns--preferably for "hard" and "related" skill officers.

••Support job satisfaction and professionalism with well defined career patterns and other rewards (training, education, promotion).

••Permit specialization in topography and related fields and provide for essential cross fertilization.

Accessions

• Access and designate adequate numbers of hard skill engineers to be SC21 officers to meet the Army's needs and to insure a utilization rate that allows cross-fertilization.

• Do not attempt to force-fit drastically underaligned specialties into the current OPMS until actual force structure approximates the ideal force structure under OFMP.

• Establish a vigorous and coordinated SC21 accession program with objective of accessing at least 85% hard skill engineers (not at the expense of shortfalls).

• Designate nonaccession SC21 officers at 6 years time in service.

• Reevaluate the logic and advisability of OFMP (Idealized Force Structure) to acquire 40% of the SC21 officer requirements at the eight year point by nonaccession designation.

ANNEX A

Engineer Professional Development

1. Demographic Data

a. Accession Source

	78	79	80
(1) USMA	100	122	105
(2) ROTC	341	344	349

b. Accession Skills

	78	79	80
(1) USMA	22	25	23
(2) Hard Skill	59	49	48
(3) Related Skill	9	13	13
(4) Soft Skill	10	13	16

c. Retention Rates

	78	79
(1) EN Losses Total	11(9)	12(9) 1/
(2) RA Retirements	2.6	3.6 2/
(3) RA Resignations	5.5(4.2)	5.7(4.2) 3/
(4) OTRA Retention	43.5(65.2)	44.8(69.0) 4/

d. Projected Total Engineer Officer Strength

80	81	82	83	84
4789	6969	5142	5299	5444

e. AUS Promotion Statistics (77-79)

	78	79	
(1) 06	39(20.2)	36(28)	Engineer (Total Army) in % of those eligible.
(2) 05	54(48.1)	54(52)	
(3) 04	57(60.8)	64(60.2)	
(4) 03	89(90.1)	91(93.5)	

f. Military Education Statistics

	78	79	80	
(1) SSC Selection Rate	4.9(4.8)	5.8(4.6)	7.7(6.3)	Engineer (Total Army) in % of those eligible.
(2) CGSC Selection Rate	15.3(14.5)	22(21.7)	13.4(15.0)	

g. Professional Engineer Registration

(1) Current Population 67% registered.

	PE	EIT		
(a)	06 - 54%	2%	of total	256 officers
(b)	05 - 35%	6%		591
(c)	04 - 21%	10%		819
(d)	03 - 8%	9%		1379
(e)	02/01 - 5%	3%		1721

(2) Current District Engineers, 71% registered.
(3) Current Facilities Engineers, 45% registered.

2. Military Education Potential

Course	Eligibility Window	Selection Procedure
Basic Course	0+	All Attend
Advanced Courses	3-8	All Attend
CSS	(7-9)	
CGSC Resident AFSC	8-15	Central Board
SSC	16-21	Central Board

Speciality Courses (not all inclusive) See DA Pam 351-4

Combat Operations
Cost Estimating
Engineer Construction Contracting
Facilities Engineering Management
Mapping, Drafting and
Nuclear and Chemical Target Analysis
Engineer Equipment Officer
Atomic Demolition Munitions
Ranger
Airborne

1/ Engineer (Total Army) in % of total officer force.
2/ Greater than total Army in %.
3/ Engineer (Total Army) in % of those eligibe.
4/ Engineer (Total Army) in % retained.

3. Opportunities for Assignments (authorized positions)

a. Functional Authorizations

TOTALS	Phases of Development	Army Activities (Cat I)	Engr Support to the Battle-field (Cat II)	Support to Army with Garrison (Cat III)	Support to Nation with Engineering (Cat IV)	TOPO
235	06	16	32	77		10
533	05	51	155	315		22
738	04	79	297	335		27
1410	03	55	722	619		16
1015	02/01	47	902	44		22

b. Command Equivalent Positions

(1) Colonel

Brigade	10
District	32
Facilities Engineer	a*

(2) Lieutenant Colonel

Battalion	63
District	9
Facilities Engineer	b*

*a+b=106

ANNEX B

Fully Funded Advanced Civil School Graduates

a. The following is a list of the number of engineer graduates, by year, who were fully funded under the Army's Advanced Civil School Program.

Engineer Codes*	Year										
	69	70	71	72	73	74	75	76	77	78	79
CFX	8	10	9	22	16	14	6	3	3	4	6
CAA			1	1	2						
CKL	2	1	8	4	3	3					
CEX	1		4	2		4	1		4	3	2
CCX (Civil)	32	65	69	50	49	46	39	37	27	32	30
CHX	9	6	16	15	13	8	2	3	1		4
CHA	3	4	23	23	33	31	35	22	17	20	10
CYX	3	5	15	17	9	14	5	2		1	
CMX						1					
CKX	15	13	16	22	22	15	5	5	1	4	3
CCF						1			1		1
CNX					1						
CWX	1	3				1		1			1
CPX			1								
CRX	1	6	9		1		2	4	1	2	
CCE			1			2			1		
CHB			1	1							
CKP	4	11	21	14	5	15	6		2	2	
CFB		2		1							
DED			4	2		4	3	4			
CKF		1									
CHE	1		1	4	9	1	3	1	1	3	1
CKB			1	2							
CLA	11	7	8	14	1	1		2	2	1	2
CLX	2	14	10	19	7	5		8	2	2	2
CSX		2	1	6			1	1			1
CHD			4	3		1			1		
CNC	33	58	63	53	49	48	39	34	26	32	37
CGX		1	8	10	11	22	6	1		2	1
CCM					3						
CCG		1	2	3	2			1	3		
CNA	6	4	7	8	19	13	11	6	9	11	15
CCL						1	1				
CK4			3				2	1	1	1	2
CLX	1					1					
CNX	3	2	1	2	1	1	1				
CHJ	C3										2
CCP											
CXX	5	5	8		3						
TOTAL	162	231	328	312	259	263	168	137	105	120	121

*All engineer civil school options not displayed.

b. Other options available to insure requisite graduate level schooling.

(1) The Degree Completion Program.

(a) Undergraduate degree completion program, 18 months.

(b) Advanced degree completion program, 18 months.

(2) ACPRD - Advanced degree program associated with a three-year tour at the granting university or an ROTC instructor.

(3) Cooperative Degree Program - Advanced degree program taken while attending CGSC or SSC. Up to six months may be spent on station in excess of SSC or CGSC requirements.